

# MARITIME REPORTER

AND  
ENGINEERING NEWS



PHM-2 Hercules — Boeing Marine Systems

**Changes In The Navy  
Shipbuilding Program  
— An Update —**

**Naval Suppliers Guide**  
(SEE PAGE 4)

# NAVY

**NOVEMBER 15, 1983**

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# ON THE COVER

Cover Photo - PMH-2 Hercules Boeing Marine Systems

## Changes In The Navy Shipbuilding Program —An Update—

PAGE 16

## Directory Of Naval Suppliers

PAGE 28

## Bob Ware Rejoins Maritime Reporter As Editor

Robert Ware, well-known maritime editor and writer, has rejoined the staff of this publication as editor, a position he held previously from April 1980 to July 1981. Prior to then he was on the editorial staff of Marine Engineering/Log from almost 24 years, the last 17 as editor.

For the past two years Bob has been an independent public relations and advertising consultant, an editorial contributor to several European marine journals, and coordinator of national maritime conferences held in Baltimore and New Orleans.

## Avondale Gets \$37-Million Contract From American SB For Tanker Forebodies

Ogden Corporation announced recently that American Ship Building Company of Tampa, Fla., has awarded a contract worth \$37 million to Avondale Shipyards, Inc. of New Orleans, an Ogden subsidiary, for the construction of forebodies for five 30,000-dwt tankers. The contract amount covers labor and overhead; all basic materials are being supplied by American Ship Building.

Delivery of the forebodies is expected to be completed within 19 months. Upon completion, each forebody will be towed from Avondale to American's Tampa yard where they will be joined to the stern sections being constructed there.

The five tankers were ordered by Ocean Products Tankers Inc. for charter to the Military Sealift Command.

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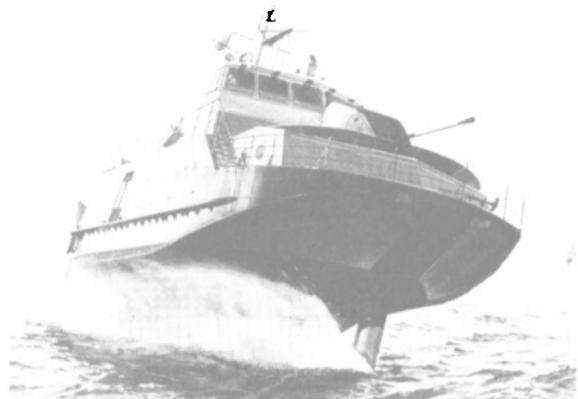
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## Indonesia Signs \$150-Million Agreement For 4 Boeing Jetfoils



A patrol hydrofoil version of the Boeing Jetfoil for which Indonesia has signed a cooperative manufacturing agreement with Boeing Marine Systems.

The Republic of Indonesia has reached agreement with Boeing Marine Systems for the purchase of four Boeing Jetfoil hydrofoils with an option for six more. The agreement includes cooperative manufacture of Jetfoils in Indonesia.

The initial contract, valued at approximately \$150 million, is for the purchase of four Jetfoils for use in coastal patrol and for Boeing to assist P.T. Pabrik Kapal (P.T. PAL), the Indonesian national shipbuilding facility, in developing the capability to manufacture the high technology hydrofoils. While P.T. PAL will obtain the ability to build the Jetfoils, Boeing will continue to manufacture the critical elements of the struts and foils and the automatic control system and supply those to Indonesia. If Indonesia opts for the additional six Jetfoils, the value to Boeing would total \$330 million.

A Boeing Jetfoil, Bima Sumudera I, was purchased by Indonesia in 1981 and used to evaluate hydrofoil potential for coastal patrol and commercial applications in Indonesia. The Indonesian Navy has identified a long-term requirement for up to 47 Jetfoils. Commercial passenger carrying Jetfoils would be in addition to that requirement.

Boeing Marine Systems has also delivered six larger Patrol Hydrofoil Missiles (PHMs) to the U.S. Navy. The Navy PHMs are stationed in Key West, Fla.

For further information on Boeing hydrofoils,

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## 63,686-Ton Bulk Carrier Delivered By Hitachi Zosen



Designed as the largest bulk carrier that can transit the Panama Canal the Maersk Seragoon features a bulb stern and B&W engines.

The Maersk Seragoon was recently delivered by the Hitachi Zosen Ariake Works to its owner, The Maersk Company Pte. Ltd., Singapore.

The ship is a bulk carrier designed to be the largest that can transit the Panama Canal. For fuel efficiency the design included such

features as a bulb stern, a constant pressure turbo-charged engine and long-life antifouling hull paint. Four deck cranes provide increased cargo-handling efficiency.

The Maersk Seragoon has a length of 215 meters; beam of 32.2 meters; draft of 12.9 meters; gross tonnage of 31,580; dead weight of 63,686 metric tons; maximum output of 12,100 hp (98 rpm); and a trial speed (maximum) of 16.98 knots. Its main engine is a Hitachi B&W and it is classified LR.

## Joint Venture Formed By Union Carbide And MTL

Union Marine Transport Company, a shipping joint venture for transporting bulk chemicals, has been established by Union Carbide Corporation and Marine Transport Lines, Inc., it was recently announced by the two parent companies.

According to **James H. Rand**, president of MTL, "The new firm will transport a wide variety of bulk chemicals for the United States chemical industry."

The new firm has a fleet of three vessels under U.S. registry: SS Chemical Pioneer, a chemical tanker which has just been delivered to Union Marine by Newport News Shipbuilding, Newport News, Va.; the chemical carrier SS Alaskan, and the oceangoing chemical barge Jo Anne.

The chemical carrier SS Chemical Pioneer is a 688-foot-long 35,000 deadweight-ton-vessel. Reportedly the most modern chemical tanker currently in service, the Pioneer has 48 distinct cargo tanks. The SS Alaskan has an overall length of 665 feet and a cargo capacity of 25,000 deadweight tons, with 31 cargo tanks. The barge Jo Anne has an overall length of 500 feet and a capacity of 13,000 deadweight tons, in eight cargo tanks.

Mr. **Rand** explained, "As the fleet is now



The Chemical Pioneer recently completing its maiden voyage is 668 feet long and carries 48 chemical cargo tanks.

constituted, MTL will be able to offer to chemical companies the space to move small parcels at costs competitive with those moving large quantities of chemicals in bulk."

The concept of "piggybacking," or parcel tanker trading, is not new to the chemical or shipping industries; however, up to now it has been far more extensively employed in foreign trade. MTL and Union Carbide, through Union Marine Transport, are now bringing this concept to the U.S.-flag domestic trade in a significant manner.

**Sundar K. Sundaresan**, vice president of marketing and corporate planning for MTL, has executive responsibility for the joint venture, and **Eugene F. Whitehorne**, marketing manager of MTL and general manager of the joint venture, has overall responsibility for operations and administration as well as for marketing and vessel utilization.

For information concerning Union Marine's cargo carrying capabilities, competitive delivery system and availability of space,

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Artists conception of the Glomar Moray Firth I.

## Global Marine Introduces New Designs For New Generation Of Heavy Weather Jackups

The rapid expansion of offshore exploration into regions of hazardous environmental conditions has served to illuminate the necessity for improvements in drilling equipment, performance standards, and safety regulations. As a result, Global Marine Drilling Company has established design standards for bottom-supported drilling units operating in such hostile environments as the eastern seaboard of Canada and the United States, the northern portion of the North Sea, Alaskan waters, and the Australian continental shelves.

These design considerations include towing and jacking capability in heavy seas; continual operations in extreme wind and wave conditions; independence from frequent resupply; and a safe, comfortable and efficient working environment.

Following extensive research, Global Marine selected two bottom-supported designs that meet or exceed these standards. The drilling units, currently being constructed by C.F.E.M. Offshore in Dunkerque, France, represent an evolution in drilling technology for severe offshore environments.

The two drilling platforms have

the highest classification issued by Det norske Veritas and conform to the U.K. Department of Trade, U.K. Department of Energy, and U.S. Coast Guard regulations. The first unit to be completed will be a C.F.E.M. T-2005 design. This drilling unit has been modified to meet the requirements established by the Canadian Oil and Gas Lands Administration and the Canadian Coast Guard. This rig will be christened the Glomar Labrador I.

A drilling unit is also being built to withstand more severe wind and wave conditions than any jackup yet envisioned. This unit, the only C.F.E.M. T-2600 currently under construction, has been designated the Glomar Moray Firth I.

Global Marine has modified the original C.F.E.M. structural and mechanical designs of both of these rigs to improve their heavy weather capabilities. The cantilever-type jackups are capable of operating at water depths of up to 300 feet while drilling to 25,000 feet. They are designed specifically to extend drilling operations into areas where other bottom-supported units must currently revert to the survival mode or withdraw completely during harsh weather seasons.

The Glomar Labrador I incorporates structural improvements to the original T-2005 design which permit continuous operations in shallow water where year-round activity has traditionally been prohibited by environmental forces. Heavier cross-sectional bracing was added to three 50-foot sections of each leg structure. These leg modifications will enable the Glomar Labrador I to operate in water depths between 115 feet and 197 feet with 82-foot maximum wave heights concurrent with 100-mile per-hour winds and a 2.48-knot surface current.

The Glomar Moray Firth I, is intended to go one step further into the extremely hostile ocean environments. The design environmental characteristics allow the unit to withstand 97 mile per hour winds accompanied by 97-foot waves in 300 feet of water. A significant structural innovation was the addition of stiffened plate steel bulkheads to the entire external surface of each jackhouse structure, greatly reducing the hull and jackhouse stresses associated with hostile ocean environments. The Glomar Moray Firth I will extend the year-round working range for offshore drilling programs in heavy-weather exploration regions where water depths do not exceed 300 feet.

A unique design feature of these jackups places the leg wells cantilevered from the hull, thereby making available large deck areas and consumables storage spaces. The platforms are supported in the elevated mode by three quadrangular truss legs, each with a spud can base. Jacking assemblies, employing three lifting units each, are utilized on two chords of each leg. The jacking units are floating electromechanical planetary gears with reaction transmitted to the hull by the jackhouses. These planetary units were chosen because of their light weight and efficient operation. The lifting units contain four motors and pinions per set for a total of 24 motors and pinions per leg. The system permits a jacking speed of 1.5 feet per minute and is equipped with out-of-level warning devices. Maximum designed jacking loads are 9,900 short tons for the Glomar Labrador I and 13,200 short tons for the Glomar Moray Firth I.

To minimize problems in towing, jacking, and station relocation in heavy wind and wave conditions, a simple and effective innovation, the SLO-ROL motion suppression system, developed by Sea Tek Corporation, was added to both rigs. The system consists of open-bottom tanks around each leg well, interconnected by air ducts and charged by an air compressor to 6 to 8 psi. The SLO-ROL system reacts instantly to incident waves from any direction, reducing the roll and pitch normally experienced. The ability to jack down

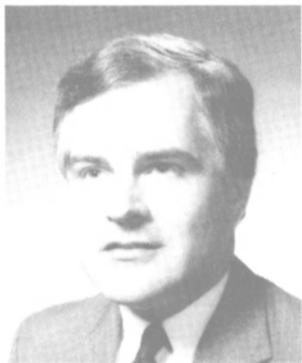
depends largely on the maximum axial and bending loads exerted on the jackup legs at the time of sea bottom contact. In any given sea state, waves induce a roll motion to the hull which imparts an impact velocity to the legs. When this impact velocity exceeds the design tolerance of the leg structures, jacking operations must be suspended. The SLO-ROL system lengthens the pitch and roll periods and reduces the pitch and roll amplitudes. Bottom impact of the spud cans is decreased and the damaging forces on the platform legs are significantly diminished, permitting jacking operations in higher seas.

The Glomar Labrador I and the Glomar Moray Firth I are nearly equivalent in onboard features. A 4,000-kilowatt power generation system, strategically located mud mixing, charging, and transfer systems, and a BOP system pressure rated at 15,000 psi are typical examples. Unique to these units is a drillfloor substructure supported by two movable cantilever beams. This hydraulically positioned substructure allows for transverse and longitudinal skidding of the derrick floor providing a live drilling area of 25 feet by 35 feet aft of the hull. The derrick substructure and cantilever beams can also be located centrally on the main deck to provide increased stability during field tows.

Global Marine modified onboard facilities of the Glomar Moray Firth I to meet the requirements for certification by the Norwegian Maritime Directorate. The heliport size has been increased and a visual flight control tower has been added. The derrick has been modified to accept a remote pipe handling system. Lifesaving equipment has been expanded and improved. The recreation areas have been increased and the 90 person crew quarters have been reduced to 74 to comply with the NMD requirement for two person staterooms with shower and toilet in each room. These modifications, and the numerous other improvements necessary to meet NMD/NPD demands, make the Glomar Moray Firth I one of the safest and most comfortable jackup drilling units designed.

The Glomar Labrador Class and the Glomar Moray Firth Class jackup drilling platforms provide all weather exploration and development capabilities for operators working in harsh ocean environments. They make bottom-supported drilling available to areas which were previously the exclusive domain of semibussmersibles. Outfitted with the SLO-ROL motion suppression system and furnished with the best equipment available, these drilling units demonstrate state-of-the-art drilling technology for versatile, safe, and cost effective operations in severe sea states.

## Baur Joins Lips Propellers As Marketing Director



James F. Baur

**Robert F. Kress**, president and chief executive officer of Lips Propellers, has announced that **James F. Baur** has been added to the staff as marketing director. Mr. **Baur** previously was the vice president of Anchor Boat Supply, Inc. of Miami. He has also served as president of the Miami Propeller Company and district marketing manager for the Castle Rock Container Company.

He has an MBA from Butler University in Indianapolis and holds a BS in management and economics from Indiana University School of Business. He is a member of the Propeller Club of the United States, the Marine Council, the Rotary Club of Downtown Miami, and the Indiana University School of Business Dean's Associates.

Lips Propellers is based in Chesapeake, Va., and specializes in the manufacture and repair of large propellers and other propulsion equipment.

## Electric Boat Awarded \$23.8-Million Contract Increase By Navy

General Dynamics, Electric Boat Division, Groton, Conn., is being awarded a \$23,880,000 face-value-increase to a previously awarded cost-plus-fixed-fee contract for additional Ohio-class ship design and construction technical support as well as systems analysis and logistics support analysis preparation. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-78-C-2507).

## Mitchell Marine Delivers Fourth Service Boat

Mitchell Marine, builder of high quality aluminum workboats and crewboats located in Lafayette, La., has recently delivered the fourth in a series of 35-foot water taxis to Jancovich & Son of San Pedro, Calif. The standard 35-foot Mitchell design was chosen to meet the requirement of transporting crews and supplies to oceangoing

vessels in the San Pedro and Long Beach anchorage areas.

Because of the combination of available deck cargo area, interior comfort and high speed, these 35-footers are well suited for water taxi purposes. All four boats are Coast Guard certified and can carry up to 24 passengers and a cargo load of 5,000 pounds.

For propulsion, each boat is equipped with two Detroit Diesel

engines coupled with Twin Disc marine gears, giving the boats a cruising speed of 25 knots.

The electronics package on these boats includes a Si-Tex III radar system and Regency MT-7000 VHF radio.

These and all other Mitchell designs are built with heavy plating to withstand repeated hard knocks, integral frame construction for longer hull life, reinforced deck

plating for heavy loads, and a low profile for good stability. These designs have evolved from experience in the construction and petroleum industries which has resulted in a line of boats that will take hard service and continue to operate for many years.

For additional information on the full line of stock 20 to 45-foot designs,

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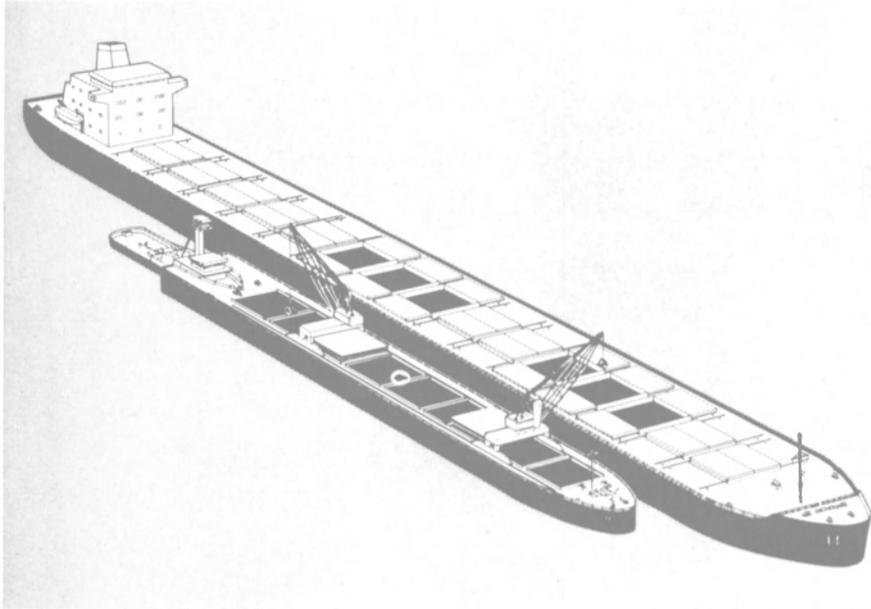
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Coal topping off barge built by Bay Shipbuilding utilizes two 25-ton cranes to transfer 1,500-tons of coal per hour.

## Bay Shipbuilding Building Coal Topping Off Barge

**George K. Geiger**, president of Bay Shipbuilding Corp., Sturgeon Bay, Wisc., a subsidiary of The Manitowoc Company, Inc., announced the signing of a contract to build a large oceangoing coal topping off barge for Lamberts Point Barge Company, Inc., a subsidiary of the Norfolk Southern Corporation of Norfolk, Va. The barge will be operated by Coastal Barge Corporation, a subsidiary of the Dowd Group of New York.

The topping off barge will be used primarily for topping off partially loaded large oceangoing bulk coal carriers of such size that they have too deep a draft to be completely loaded at U.S. coal loading terminals.

The barge will be 550 feet in length and 78 feet in beam and will be fitted with a deep stern notch to accommodate a tug of 7,200 horsepower. With a draft of 32 feet the barge will have a cargo capacity in excess of 36,000 short tons of coal. Nine individual hatch covers will provide ample access to the barge's four cargo holds. It will be equipped with hydraulically

controlled skags to maintain directional stability while under tow; a 1,000-horsepower, fixed-pitch bow thruster will provide additional maneuverability. The barge will also be equipped with a diesel-powered electric generating plant, twin anchors, a double windlass, fendering, and ballasting system.

Bay Shipbuilding's parent company, The Manitowoc Company, Inc., will manufacture the two Manitowoc 4600 Series III clamshell cranes which will provide the barge with self loading, unloading, and transferring capabilities in excess of 1,500 tons per hour. The two 4600's rotate on special 16-foot roller paths mounted atop self-propelled gantries that travel on rails along the length of the cargo hold. Each crane will be equipped with a 140-foot boom, provide a 25-ton clamshell capacity and will be equipped with an elevated operator's module to provide optimum visibility for loading.

The barge will be built under survey and inspection of the United States Coast Guard and to the ABS + A1 Barge classification.

## Tracor Develops Coastal Surveillance Systems

The Applied Sciences Group of Tracor, Inc., Austin, Texas, has announced its development of a new product line of computerized coastal surveillance equipment to assist nations in the patrol of waters for fishing violations, smugglers, search and rescue missions, pollution, and foreign ships.

"The Tracor Coastal Surveillance Information System, for on-

shore computer-based facilities, and a Carry On-board Processor, a transportable data entry unit for use on aircraft, vessels, and ground platforms, represent a more effective means of patrolling coastal waters," said Dr. **William C. Moyer**, group vice president for Tracor Applied Sciences.

The systems are marketed by Tracor Applied Sciences in Lexington Park, Md.

For further information, Write 22 on Reader Service Card



## Tug Christopher B. Turecamo Rebuilt And Repowered

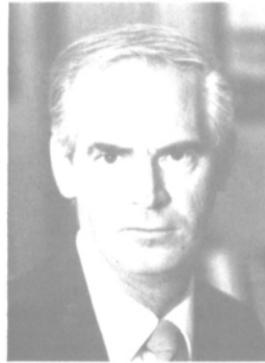
The tugboat Christopher B. Turecamo, owned by White Stack Towing & Transportation Company, Inc., Charleston, S.C., was repowered recently with an Alco diesel engine, model 16-251-E, which delivers 3,000 bhp through a Reintjes 4.5:1 reduction gear. Electric power is now supplied by two GM Detroit Diesel powered generators. The 241-gt tug is 100 feet long with a beam of 28 feet and draft of 14 feet. Fuel capacity is 26,000 gallons; the fire pump is rated 500 gpm. The upgrading work was performed by Braswell Shipyards, Inc., also of Charleston.

## Vitro Gets \$3.2-Million Navy Aegis Contract

Automation Industries Incorporated, Vitro Laboratories, Silver Spring, Md., has been awarded a \$3,218,116 cost-plus-fixed-fee contract for providing 53 man-years of technical and engineering support in the areas of Aegis combat system engineering, advanced system

engineering and integration, engineering technical and administrative assistance, configuration control assistance, combat direction system support, combat systems engineering, developing site planning and design, ship test and evaluation support, and other system engineering support. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

## Swift Group Management Promotions Announced



Bernard Heaps



Calvin J. Leleux



Sidney C. Mizell

The following promotions were announced by **Jerry L. Hoffpauir**, president of Swift Group. The Swift Group, commonly referred to as Swiftships, Inc., is comprised of Champion Swiftships, Swiftships Morgan City, Swiftships Lafitte, Swiftships Freeport, and Swiftships Maroil, Singapore.

**Bernard (Barney) Heaps** has been promoted to senior vice president of the Group. He will be responsible for production, planning, safety, security, and profit improvement. He was formerly vice president of Champion Shipyards when it was acquired by Swift-

ships, Inc. in 1982.

**Calvin J. Leleux** has been promoted to vice president of engineering for the Group. He will be responsible for all phases of design, engineering, and working drawings. Mr. **Leleux** joined Swiftships, Inc. in 1973.

**Sidney C. Mizell** has been promoted to vice president of marketing for the Group. He will be responsible for all sales, marketing, advertising, and public relations. He joined Swiftships, Inc. with the acquisition of Champion Shipyards in 1982.

## Radm. Nunneley New President Of ASNE

Rear Adm. **James K. Nunneley**, USN, Director, Maintenance and Modernization Division, Office of the Chief of Naval Operations (OP-43) was installed as president of the American Society of Naval Engineers at the Society's annual turnover dinner at the Shoreham Hotel in Washington, D.C.



James K. Nunneley

Admiral **Nunneley** is the 88th president of ASNE which was founded in 1888. The Society provides a forum for direct communication between government engineers, both civilian and military, and industry engineers, shipbuilders and operators, and suppliers of related services and equipment. The Society's membership now includes 6,800 members about half of whom are active duty or retired military and half are civilian. In 1983, ASNE celebrates 95 years of service to the profession of naval engineering.

Admiral **Nunneley** graduated from the U.S. Naval Academy with distinction on June 6, 1952, and from MIT in June 1957 at which time he received his professional degree of Naval Engineer, his MS degree in Naval Architecture and Marine Engineering, and simultaneously was designated an Engineering Duty Officer (ED).

After serving on several naval vessels and naval shipyards in an engineering capacity and having attended the Naval War College, Admiral **Nunneley** assumed command of the Puget Sound Naval Shipyard. In 1979 he was selected to the rank of Rear Admiral. He has been an active member of ASNE for the past 20 years.

## New High-Tech Towline Introduced By American

—Literature Available

American Manufacturing Company, one of the largest rope makers in the United States, recently introduced a new high-tech rope for end-to-end towing applications.

Traditionally, nylon has been used for most towing applications. Compared with nylon, American's new AMESTER rope is said to withstand more cyclic loading, offer superior ultraviolet resistance, and have better wearing properties and wet strength, and provide elongation equal to or greater than nylon.

According to the manufacturer, AMESTER end-to-end towline surpasses nylon in every critical specification. It is presently available in three-strand and plaited construction up to 18 inches in circumference.

For complete information and prices,

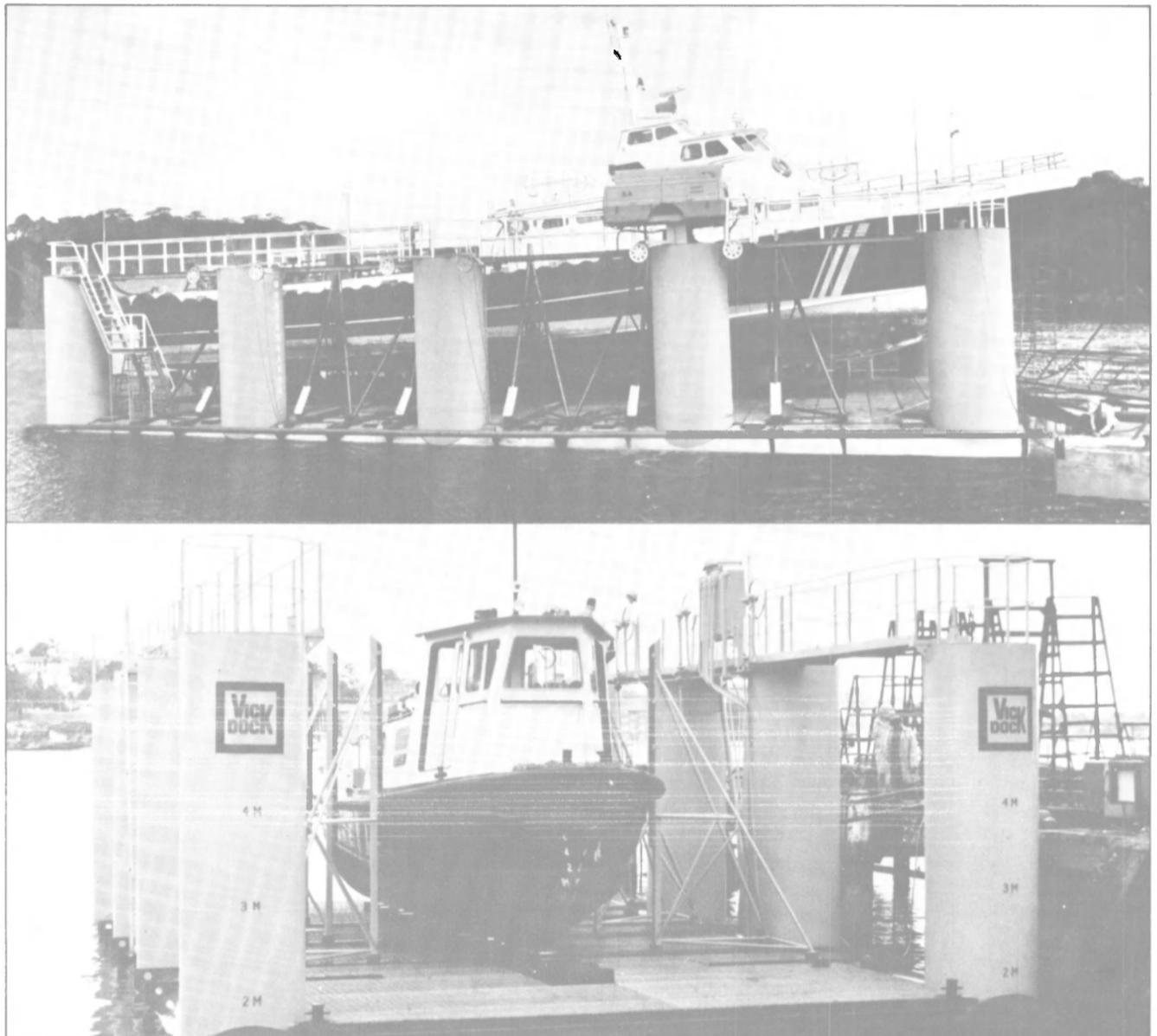
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## Sealol Names Vassalotti Manager Tensioner Systems

**James J. Cummins**, director, business development for Sealol's Engineered Product Division, Warwick, R.I., has announced the appointment of **Michael Vassalotti** as manager, tensioner systems.

Most recently Mr. **Vassalotti** was associated with Nuclear Energy Services, Inc., Danbury, Conn.

At Nuclear Energy Services he served as a project manager, an applications engineer and was responsible for nuclear power station applications in tensioner systems. With six years of engineering and marketing experience in the nuclear power industry with an emphasis on tensioner systems applications, Mr. **Vassalotti** brings a special expertise to Sealol.



Top: A 100 tonne Vickdock® operating in Brunei. Above: A 30 tonne Vickdock working in Sydney Harbour, Australia.

## A floating dock for any vessel up to 300 tonnes.

This new floating, submersible dock (shown above) works quickly, safely whether the tide is in or out. The all welded, steel Vickdock provides a generous working area well out of the water to allow a safe, level and dry surface.

One man can easily operate the Vickdock. The tanks are flooded to allow the vessel to float over the dock. The tanks are then blown clear, submarine fashion, by compressed air allowing much faster operation than conventional pumps. Tools and repair equipment can

also be operated from the main air compressor.

As an example of Vickdock's speed, a 12 metre (approx. 36ft) craft can be lifted clear of the water, cleaned and relaunched within 90 minutes.

All U.S. inquiries should be directed to Gionnotti & Associates Inc., Houston Texas (713) 987 0117-

The AMMAC Corporation, Wilmington, California is licensed to have the docks constructed within the U.S.A.

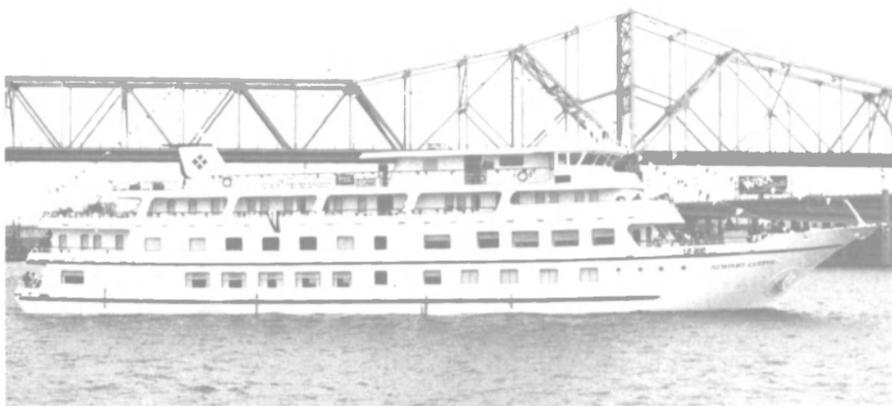
Canadian inquiries to Mantle Industries Ltd., Delta, British Columbia (604) 946 9521.



## Vickers Cockatoo Dockyard Pty. Ltd.

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N.S.W. 2061 Australia  
Telephone: 9201333, Telex: AA72086

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## Miniliner Newport Clipper Delivered By Jeffboat

Jeffboat, Incorporated of Jeffersonville, Ind., recently completed the luxury cruise vessel Newport Clipper, first of its type ever built at the Indiana yard. Constructed for Clipper Cruise Line of St. Louis at a cost of about \$9 million, the vessel will operate on seven-day cruises in areas along the U.S. Eastern Seaboard from New England to the Colonial South and South Florida Waterways according to the season, with a winter schedule in the Virgin Islands.

During christening ceremonies just prior to delivery of the new vessel, it was announced that Clipper Cruise Line and Jeffboat had signed a contract for construction of a sister vessel to the Newport Clipper, with delivery scheduled for December 1984 (see photo). The owner indicated that the second vessel, yet unnamed, will operate on an itinerary similar to that of her sister ship.

The hull of the Newport Clipper is constructed of 1/2-inch steel plate

throughout except for the bow and stern which are 3/8-inch plate. Gross tonnage is 100 and displacement 1,000 long tons. Overall length is 207 feet, beam amidships 37 feet, and draft 7 1/2 feet.

Propulsion power is provided by two 12-cylinder, GM Detroit Diesel 12V-71 engines, each rated 480 bhp at 2,300 rpm, providing an average cruising speed of 10 mph. The main engines drive, via two Twin Disc hydraulic reverse/reduction gears with a ratio of 4.13:1, two Columbian four-bladed, stainless-steel propellers having a diameter of 48 inches and 39-inch pitch. The console-mounted steering system provided by SSI has full follow-up control. A bow thruster supplied by Omnithruster is powered by a 200-hp electric motor.

Electric power is supplied by three 225-kw generators given by Detroit Diesel 12V-71 engines. The marine sanitation system is an Omnipure Model RM812-27, Type

II. Raw water heat exchangers for engine cooling are mounted on each propulsion and generator unit.

In addition to the usual VHF and SSB communications equipment, the vessel is fitted with two radars, satellite navigation system, and Loran C, all manufactured by Furuno.

The Newport Clipper's four passenger decks contain 51 state-rooms, all outside and with large windows. Normal passenger capacity is 100, but 111 could be carried if upper berths that are fitted in some cabins were used. The vessel

has a crew of 25, and is of United States registry.

### NEWPORT CLIPPER

#### Major Suppliers

Main Engines	GM Detroit Diesel
Rev/Reduction Gears	Twin Disc
Propellers	Columbian
Steering System	SSI
Bow Thruster	Omnithruster
Generator Sets (3)	GM Detroit Diesel
Sanitation System	Omnipure
Radars (2)	Furuno
Loran C	Furuno
Satellite Navigator	Furuno

### New Brochure Available On International Paint's Intershield EG Series

International Paint, the world's largest marine paint organization, is offering a full-color brochure on its Intershield EG series of marine coatings. The result of many years of intensive research, the EG series is a two-component product specifically designed to provide high performance against corrosion and abrasion.

It is specifically recommended for boottops, topsides, decks, and superstructures to give reduced corrosion due to mechanical damage, improved cosmetic appearance, and minimized maintenance and repair painting. Used in conjunction with International's Intersmooth SPC self-polishing copolymer antifouling, Intershield EG series offers a very cost-effective solution for maintaining a smooth underwater hull, thereby maximizing fuel economy.

For a copy of the EG series brochure,

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### Ship Survivability Topic Of Symposium In Philadelphia December 7

The Naval Ship Systems Engineering Station (NAVSSSES) and the Delaware Valley Chapter of the American Society of Naval Engineers (ASNE) are jointly sponsoring a one-day colloquium covering present and future ship survivability issues in Naval, Coast Guard, and commercial marine applications. The meeting will be held on December 7 at the University of Pennsylvania in Philadelphia.

Some 500 participants are expected to be on hand when Vice Adm. **Robert L. Walters**, USN, Deputy Chief of Naval Operations for Surface Warfare, makes the keynote address. The Hon. **Robert A. Borski**, House of Representatives, representing Pennsylvania's Third Congressional District, will be the luncheon speaker. Congressman **Borski** is a member of the House Committee on Merchant Marine and Fisheries.

**James Deal**, Sanders and Thomas, Inc., chairman of Delaware Valley ASNE, and **Thomas P. Campbell**, Newport News Technical Services, Inc., vice chairman, announced that Vice Adm. **Robert O. Gooding**, USN (Ret.), chairman of the board, Columbia Research Corporation, and Dr. **Joseph Bordogna**, Dean, School of Engineering and Applied Sciences, University of Pennsylvania, will moderate the technical sessions.

Anyone interested in attending the colloquium (registration fee is \$50) should contact **Eli Axler**, QED Systems, Inc., 3001 Greentree Executive Campus, Route 73, Marlton, N.J. 08053; telephone (609) 596-0610.

### Free Brochure Describes Fourth Generation Marine Diesel Oil

An eight-page, four-color brochure describes Mobilgard 450 Marine Diesel Engine Oil, a fourth generation SAE 40 lubricant created specifically to meet the requirements of high-output, medium-speed trunk diesel engines operating under severe conditions. The new oil is formulated for improved engine protection, longer life and less oil consumption. It has the reserve alkalinity needed in engines burning fuels with up to two percent sulfur content.

According to the brochure, the new oil meets the requirements of all General Motors Electro-Motive Division marine diesel engines, including those equipped with silver wrist pin bearings. Extensive fleet service and laboratory testing have proven its performance in General Electric, ALCO, Fairbanks Morse, Detroit Diesel, Caterpillar and Cummins engines. Mobilgard 450 can also be used in these engines in drilling rigs and stationary power generation service. It exceeds the API requirements for a CD engine oil.

Picture and charts in the brochure tell the story of Mobilgard 450's exceptional performance. For a copy of the brochure,

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Contract for sister vessel to Newport Clipper was announced at christening. Seated, L to R: **Barney A. Ebsworth**, president of Clipper Cruise Line, and **Robert W. Greene**, president of Jeffboat. Standing, L to R: **H.J. Bobzein, Jr.**, president, American Commercial Lines, Inc., and **Paul H. Duynhouwer**, vice president-marketing and sales, Clipper Cruise Line.

## Marinette Marine Awarded \$6-Million Navy Contract

Marinette Marine Corporation has been awarded by the Naval Sea Systems Command a contract modification for the construction of three additional Torpedo Weapon Retrievers. Total value of the contract modification exceeds \$6 million.

The three vessel option is a part of an existing contract for the construction of five TWR's which was awarded to MMC in July of this year. The TWR class vessel is a totally new design developed by Marinette Marine to replace the Navy's aging existing TWR vessels. The TWR craft are utilized by the Navy for recovering spent torpedoes, missiles, small drones and mobile targets fired during weapons systems tests of all submarines and combatant ships. The newly designed vessel is capable of staying on station for a week in support of these tests, thus avoiding long delay times for ships, caused in the past by smaller boats having to return to base at night and then return to the test site the next day.

The TWR vessel will be 120 feet in length with a beam of 25 feet, depth of 12 feet and approximate displacement of 213 tons. Accommodations are provided for a complement of 18 persons. The vessel is entirely steel construction, 2,000 hp, with twin screws driving fixed-pitch propellers. The TWR has a design speed of 16 knots and a range of 1,700 nautical miles.

Construction on the TWR contract begins in late 1983, while delivery of the three additional TWR craft is scheduled to begin in July of 1985.

## Literature Available On TeleSystems' Newest Marine Communications System

The new MSC-9000 Maritime Communications System from TeleSystems, a COMSAT company, is a shipboard satellite terminal offering telephone, telex, data, and facsimile transmission capability with automatic tuning to all 339 available channels. It is designed to meet or exceed all MARISAT and INMARSAT specifications.

Years of experience in the design, installation, and maintenance of MARISAT terminal equipment have contributed to the evolution of the MCS-9000, resulting in a compact system that was designed with present and future needs in mind. The system is compact, versatile, and flexible, with high reliability, low life cycle costs, and ease of operation.

For a free brochure that contains a full description and technical specifications of the MSC-9000,

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## ASNE Call For Papers For '84 Naval Ship Symposium

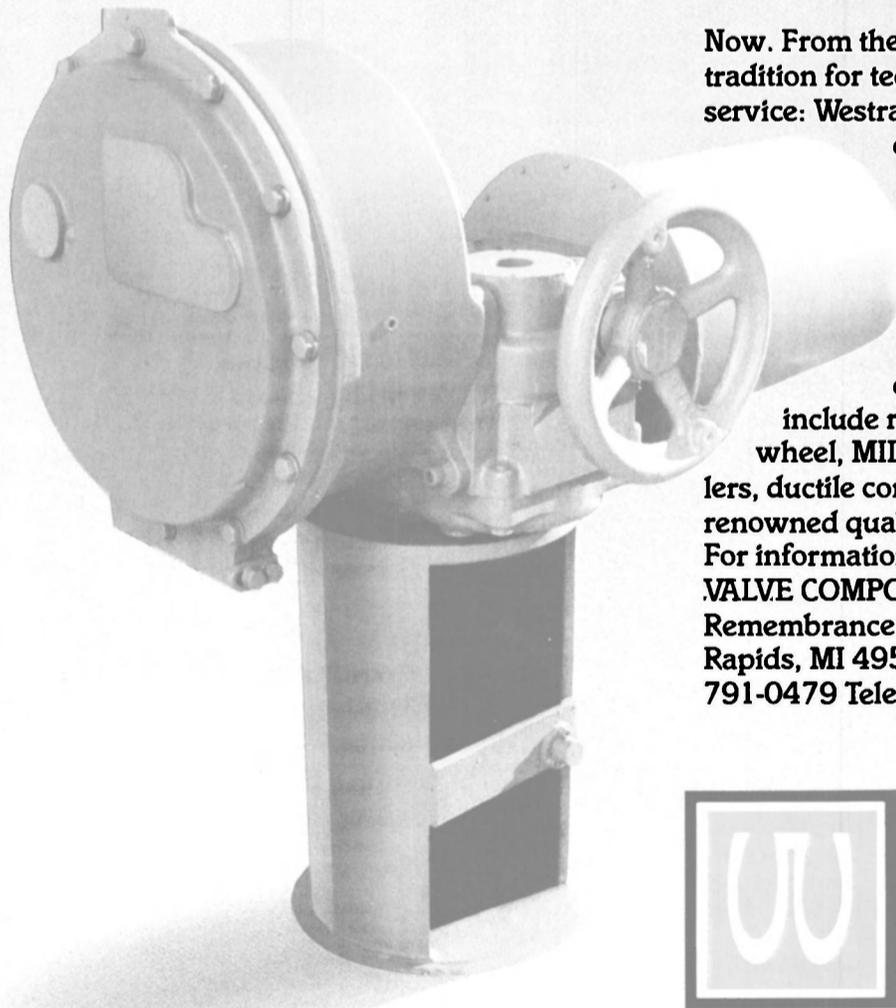
Papers are now being solicited by the Tidewater Section of the American Society of Naval Engineers for the Naval Ship Maintenance & Modernization Symposium subtitled "Affordability." The symposium, to be held October 3-

4, 1984, at the Omni Hotel, Norfolk, Va., is co-sponsored by Commander-in-Chief, U.S. Atlantic Fleet.

Papers are requested covering the topic, Naval Ship Maintenance and Modernization, with emphasis on efforts toward increased productivity and cost reduction. Updates of previously presented papers are cordially welcome. A list of suggested areas of interest are

available upon request. Short abstracts of all applying papers should be submitted no later than December 1, 1983. More information is available by contacting: ASNE Headquarters, 1452 Duke Street, Alexandria, Va. 22314; Phone: (703) 836-6727 or by writing Rear Adm. **Thomas M. Ward Jr.**, USN (Ret.), Symposium Papers Chairman, 1417 N. Battlefield Boulevard, Chesapeake, Va. 23320.

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The ARS construction principals at Peterson Builders are from left to right: Harry W. Taylor, ABS; Cmdr. Paul Robinson, USN; Robert E. Peterson, vice president, PBI; Joe Gagnon, vice president, PBI.

### Third ARS Keel Laying At Peterson Builders

The detail design and construction contract Peterson Builders Inc., of Sturgeon Bay, Wisc., previously signed with the U.S. Navy has led to a succession of ARS keel layings at PBI. First the ARS-50 Safeguard in 1982; then the ARS-51 Grasp earlier this year, and a third keel was recently laid for ARS-52.

The ARS Class vessels are being constructed for the U.S. Navy to replace an aging class of rescue/salvage vessels and to upgrade the mission-essential equipments and systems found onboard vessels of this type. The mission of these ships is fourfold: (1) Debeaching of stranded vessels, (2) Heavy lift capability from ocean depths, (3) Towing of other vessels with wire or synthetic hawsers, and (4) Manned diving operations.

For rescue missions the ship is equipped with fire monitors amidships and on the forward kingpost that can deliver both foam and seawater. The salvage holds of the ships are outfitted with portable equipment to effect assistance to

other vessels in dewatering, patching, electrical power and other essential services required to return a disabled ship to an operating condition. The ships will have the finest diver life support air system in the Navy fleet.

The rugged construction of these steel-hulled vessels, combined with their speed and endurance, make the ARS ships well suited for rescue/salvage operations on behalf of Naval and commercial shipping throughout the world. The versatility of these ships will add immeasurably to the capabilities of the U.S. Navy with regard to rendering assistance to those in peril on the high seas.

The lead ship of the series will be launched in early November at Peterson Builders. A fourth ARS is also under contract with PBI.

Dimensions of the ARS Rescue/Salvage vessel are as follows: 255 feet length overall, 51-foot beam, 15-foot draft. The ship has a 2,725-ton displacement and a sustained cruising speed of 14 knots.

### Fritz Culver Offers Free Data Package On Towing/Anchor Winches

Fritz Culver Inc., Covington, La., a leading manufacturer of high-quality towing/anchor-handling winches and deck equipment, is offering a free data package on the full line of towing/anchor-handling winches built under license from A/S Hydraulik Brattvaag.

Hydraulic pumps, motors, valves and controls are supplied by Hydraulik Brattvaag but the winch is built in the United States by Fritz Culver. As a world leader in the development of low-pressure hydraulic systems, Hydraulik

Brattvaag has built over 40,000 units since 1941.

The data package includes a full description of the design features of the winch line, four different winch styles, comparisons and optional equipment available.

Seven different models of towing/anchor-handling winches are described in full detail with photos and plan view and side elevation drawings, with dimensions for each model. All data is included—drum specifications, rated line pulls and speeds at various positions on the drum and more.

For a free Fritz Culver data package,

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### Navy Awards Tracor \$7.7-Million Contract

Tracor, Inc., Austin, Texas, has received a multi-year contract from the Naval Supply Center, Norfolk, Va., for engineering, analytical, and technical support as required by the NAVSEA Combat System Engineering Station in Norfolk for the AN/SQQ-89 (V) Underwater Sensor System, the Anti-Submarine Warfare Control System, and associated subsystems.

The one-year contract includes two one-year options and has a total potential value of \$7,696,150.

Dr. William C. Moyer, group vice president of Tracor Applied Sciences, said the new work represents a continuing involvement of the company in the installation and integration of independent sonar systems requiring multiple variations created by a diversity of ship classes.

Dr. Moyer said the work will be performed by Tracor's Systems Technology Division from its operations in Groton, Conn. The Division is under the general management of William M. Pugh, division vice president.

Mr. Pugh announced that Marshall P. Hall of the Groton Directorate has assigned Victor S. Asciolla, Surface Engineering Department director, to manage the new program. The majority of the engineering and analytical efforts will be accomplished in the Groton facilities, complemented by off-site support at Norfolk and other locations throughout the country.

### COMTECH Awarded Navy Contract For \$4,126,745

COMTECH Telecommunications Corporation, Hauppauge, N.Y., has been awarded a \$4,126,745 cost-plus-incentive-fee contract for seven satellite communications signal analyzers. The Naval Electronic System Command, Washington, D.C., is the contracting activity (N00039-83-C-0266).

### K. Fox Named Senior VP By Tacoma Boatbuilding

Tacoma Boatbuilding Co., Tacoma, Wash., has announced the appointment of Kenneth Fox as senior vice president, a new position at the company, a builder of high performance, medium-size naval ships and other vessels.

"This action solidifies our recent efforts, including the election of B. James Lowe as president on July 9," noted Frank B. Lynott, Tacoma Boatbuilding Co. chairman, "in positioning the company's executive group to coordinate project management and engineering more effectively, to accept significant

new work, and to resume full production as a nine-week strike of shipyard workers winds down."

Reporting to Mr. Fox will be three vice presidents and their departments: Claus G. Hackenberger, engineering; William M. Rickett, project management; and Wallis E. Vivit, project development. Mr. Fox will report to Mr. Lowe, who is chief operating officer, as well as president. As senior vice president for engineering and planning, Mr. Fox also will direct long range planning, coordination of capital improvement plans and implementation, and development of cost-reduction and efficiency improvement programs.

### Thomas Marine Offers 38' Aluminum Crewboat —Literature Available



Detroit Diesel-powered crewboat carries 22 and a crew of three.

Thomas Marine's latest offering is a 38-foot 6-inch crewboat which seats up to 22 workmen in a dry cabin plus a crew of three. Speed is 12 knots cruising and 14 knots in a dash.

The crewboat is of 1/4-inch aluminum plate construction heli-arc welded and reinforced. Length measures 38 feet 6 inches, beam 12 feet 6 inches, with a draft of 40 inches. A pair of Detroit Diesels, 4-53, of 140 hp. (keel cooled) provide the power. Marine Gears, Borg Warner 2.5-1 Vee-Drives. The propellers are Columbian 22 by 22-inch, bronze, three blade.

Steering for the crewboat is Hydraulic Hydraulic. Keel Coolers by Thomas Marine; shafts are Armco, Aquamet 22. Bearings: Johnson Duramax Nonmetallic. Electric panels: Kes Electric. Radios: Motorola and ICOM. Fathometer: Impulse Digital. Paints: Devoe and DuPont. Controls: Morse.

The hull design is by Thomas Marine, Inc. Keel: full keel, extending below the prop tips. Water tight Bomar hatches. Seating: 22 passengers, plus a crew of 3. Window defrosters and cabin heat by Thomas Marine, Inc. Isolation Transformer by La Marsh. Aluminum by Kaiser.

This is a specialized hull design by Thomas Marine. Variations to the design are possible and an extensive line of workboats, patrol boats, dredge tenders and fishing boats are offered.

For more information,

Write 32 on Reader Service Card

**Nav-Com Names Franza  
Director Of Marketing**



Gary J. Franza

Gerald A. Gutman, president of Nav-Com Incorporated has announced the appointment of **Gary J. Franza** to the position of director of marketing.

This announcement follows the recent acquisition of Nav-Com by Magnavox Government & Industrial Electronics Company which is designed to broaden the company's penetration into new and existing marine markets. Nav-Com is engaged in the sales and service

communication and navigation electronics as well as sophisticated systems integration engineering and Shipboard Computer Systems.

Mr. **Franza** was previously national marketing manager for Scientific-Atlanta, manufacturers of Inmarsat satellite communication ship earth stations. Prior to Scientific-Atlanta he was maritime product manager for Comsat General Telesystems. As a graduate of the U.S. Merchant Marine Academy, he will bring additional maritime expertise to Nav-Com's staff of professionals.

**Vitro Industries Gets  
\$3.24-Million Navy Contract**

Vitro Industries Incorporated, Vitro Laboratories Division, Silver Spring, Md. has been awarded a \$3,240,000 cost-plus-fixed-fee contract for materials and services to integrate the Tomahawk sea-launched cruise missile for launch control groups MK1, Mod 2, into USS New Jersey (BB-62) and USS Iowa (BB-61). The Joint Cruise

Missiles Project Office, Washington, D.C., is the contracting activity.

**Wartsila Arctic Opens  
Office In Vancouver**

Wartsila, Helsinki, Finland, well established as a designer and builder of icebreakers and ice-breaking merchant vessels, has opened an engineering firm in Vancouver, B.C. The new company Wartsila Arctic Inc. provides engineering services in the field of Arctic Marine Technology.

Wartsila has been actively involved in the research, development, design and construction of icebreaking ships since the early fifties. The company has built approximately 70 icebreakers and icebreaking merchant vessels. In 1970 Wartsila opened an icebreaking model basin, reported to be the first of its kind in a Western country.

The company will have an experienced management team at

the Wartsila Shipyards in Finland responsible for transferring technology to the new company.

**Eero Makinen**, former Assistant Managing Director of the Wartsila Helsinki Shipyard has been appointed president of Wartsila Arctic Inc., and **Stefan Gordin** former manager of Arctic Consulting of the same yard, has been appointed vice president.

**\$26.6-Million Contract  
Increase Awarded To  
G.D. Electric Boat Div.**

General Dynamics, Electric Boat Division, Groton, Conn., is being awarded a \$26,693,405 face-value-increase to a previously awarded cost-plus-fixed-fee contract for exercise of an option for additional design agent services for Ohio-class submarines. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (NOO024-80-C-2075).



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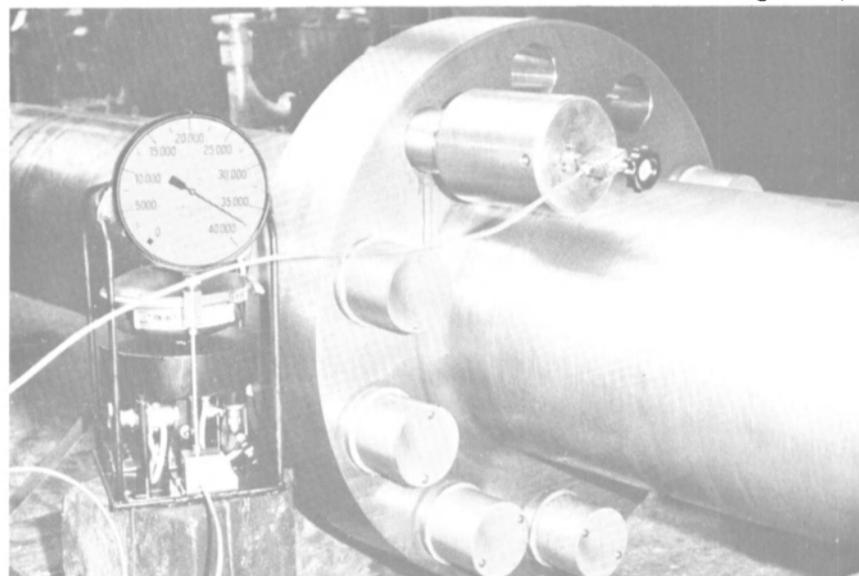
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## Offshore Drilling Rig Sedco 602 Delivered By Promet Shipyard

Sedco 602, a medium-sized, semisubmersible drilling rig, was delivered recently by Promet Private Limited shipyard of Singapore. This rig is owned jointly by Sedco Inc. and Occidental Exploration and Production Company. Mrs. Sally Martin, wife of the president of Occidental, christened the rig.

Designed by Earl & Wright, the new rig can operate in water depths of 25 to 180 feet. The mooring tensioner riser, and drill fluid systems have been designed for exploratory and development drilling to 20,000 feet. The design of this semisubmersible makes it particularly useful in parts of the world where drillships are inefficient and the cost of using semisubmersibles uneconomical.

The Sedco 602's main deck measures 170 by

170 feet. It has living quarters for 88 crew members and other facilities that include a hospital and a recreation room with cinema area. Sophisticated equipment onboard includes a closed circuit television and satellite communications system. The rig is equipped with two deck cranes having booms of 100 feet and lifting capacities of 50 tons. Also fitted is a helideck able to take the weight of a fully loaded Sikorsky S-61N helicopter.

Sedco 602 is classed by the American Bureau of Shipping and is built to requirements and specifications of the U.S. Coast Guard and the Intergovernmental Maritime Organization. It will operate first in the Philippines then go to China for drilling operations.

This rig is the third semisubmersible built by Promet. In the first half of 1983 the Singapore yard delivered two similar rigs of the SEDCO 600 series.

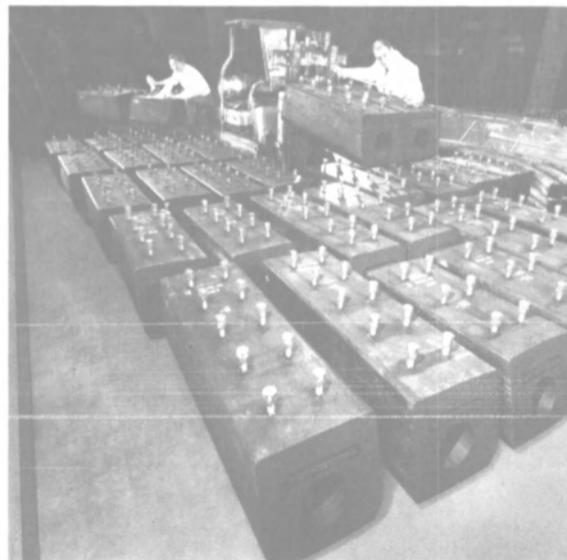
Sedco Inc. is one of the world's largest inter-



Sedco 602 rig has main deck 170 by 170 feet and can drill to 20,000 feet in water depths from 25 to 180 feet. Living quarters for crew of 88 include hospital and recreation room.

national drilling contractors, operating a fleet of more than 40 offshore units around the world. Occidental Exploration and Production, established for 22 years, is well known in the field of oil exploration, production, and refining.

## Uniroyal Fendering To Be Fitted On ARAMCO Tug —Literature Available



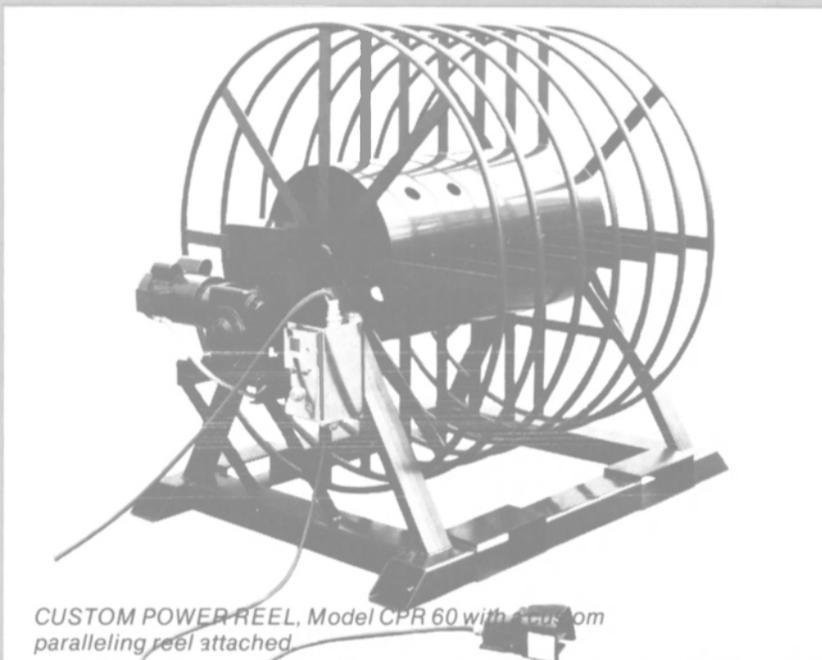
Components of an extruded EPDM/butyl fendering system receive the final inspection at the Uniroyal Engineered Systems plant in Mishawaka, Ind., prior to shipping to the ARAMCO maritime company for use on one of its 6,000-bhp Water Tractor tugboats.

Neal Olsen (right) Uniroyal senior product engineer, measures the widths and dimensions of two units while employee Tom Montgomery (left) stencils numbers. According to Mr. Olsen, it takes 186 pieces of 47 different designs to outfit a typical ARAMCO tug. Uniroyal, which already has supplied fendering for three of the company's tugs, developed the numbered unit system to simplify installation. The synthetic rubber fendering is able to withstand both hot and cold temperature extremes without cracking or losing its shock-dampening capabilities. Mr. Olsen said the biggest challenge in producing the custom-designed fendering system was keeping the die properly adjusted. The metal plate inside each piece of fendering also has to be perfectly aligned so that mounting studs can be inserted. Uniroyal is one of the largest fendering producers in the world.

For additional information,

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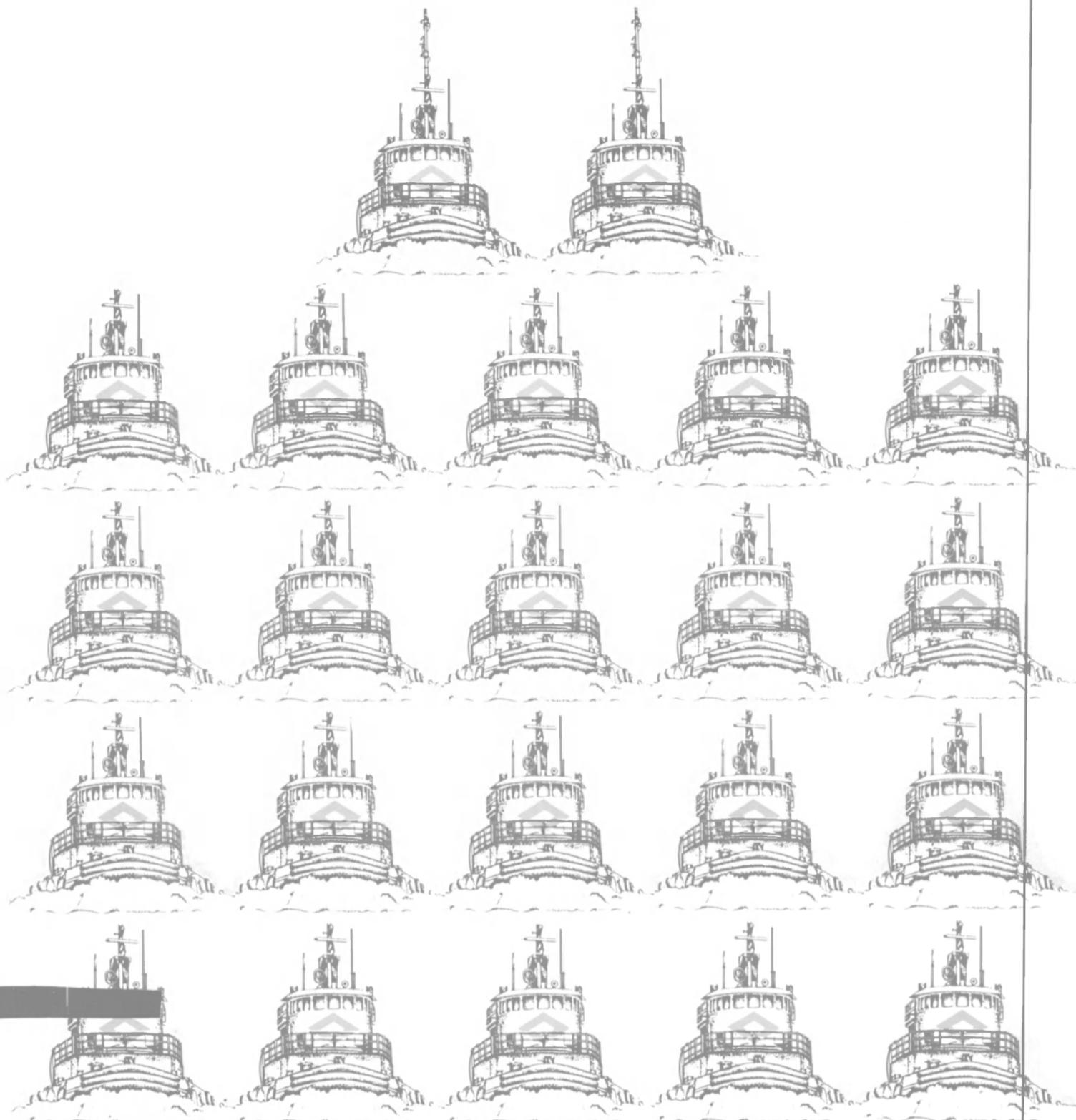
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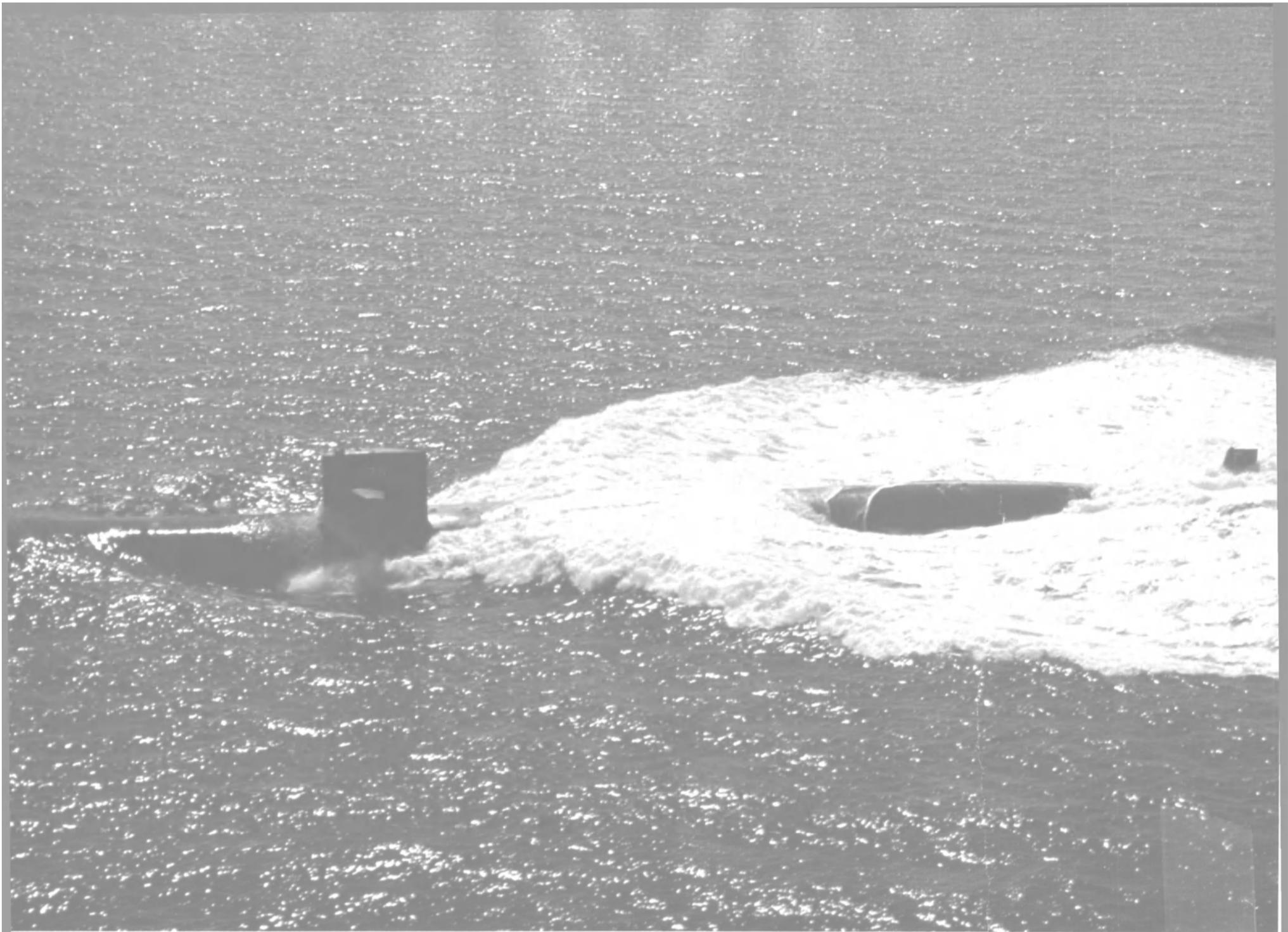
(and cost-saving) efficiencies. Perhaps that's why more marine managers are saying, "When you go with Curtis Bay Towing, you have more on your side."

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## Changes In The Navy Shipbuilding Program — An Update —

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

*International Maritime Associates, Inc., is a management consulting firm located in Washington, D.C. The firm specializes in providing market analyses, competitive assessments, project evaluations and corporate planning. Recent clients include M.A.N.-B&W Diesel, Grumman Aerospace, Todd Shipyards, World Bank, Industrial Development Bank of Malaysia, and various Scandinavian shipowners. IMA has been involved in maritime projects in more than 15 countries. For additional information, contact **James R. McCaul**, International Maritime Associates, Inc., 1800 K St. N.W., Washington, D.C. 20006. Telephone (202) 296-4615 or telex 64325.*

This update is divided into three sections: legislative action, developments in the shipbuilding program, and Navy contracts awarded since June. It includes information available as of September 30, 1983.

### **1. LEGISLATIVE ACTION** **Fiscal Year 1984 Defense** **Authorizations Passed,** **Appropriations** **Still in Committees**

FY 1984 Defense Authorization has passed in both House and Senate. A House-Senate Conference Report (98-213) was issued August 16. Final passage in Senate came on September 13. Final vote in House was taken on September 15. President **Reagan** signed the bill into law on September 24.

(continued on page 19)





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Self polishing copolymer A.F.

A unique high solids self polishing copolymer antifouling with a track record dating back to 1974. Intersmooth systems are currently approved by the Royal Navy and are in use on British, Norwegian, Spanish, Canadian and US Naval vessels giving outstanding results.

Because Intersmooth systems polish and smooth in-service they reduce frictional drag on the hull and avoid coatings build up. Biocide and paint binder are chemically combined which means they remain fully effective as antifoulings whether the vessel is operating at full speed or at rest on station or in port.

Increased mission availability comes from Intersmooth systems providing:

- extended in-service periods
- increased range (due to fuel savings)
- increased speed (due to a smooth fouling free hull)
- elimination of underwater cleaning and its associated down time.

Cost savings come from Intersmooth systems providing:

- savings in drydockings due to extended in-service periods
- fuel savings of up to 12% per year
- elimination of underwater cleaning costs



High solids, high performance anticorrosive

A high solids, high performance anticorrosive with outstanding abrasion resistant properties for all over ship protection. Specifically recommended for:

Boottops, topsides, decks and superstructures to give:

- reduced corrosion due to mechanical damage
- improved cosmetic appearance
- minimized maintenance and repair painting with the associated benefits of:
  - reduced coatings build up
  - reduced weight build leading to increased systems and weapons capacity
  - reduced requirement to carry on board maintenance paint and thinners

Underwater hull to give:

- longer anticorrosive scheme life due to its abrasion resistant properties thereby reducing the need for frequent hull blasting
- a smoother hull due to damage and its associated roughness being minimized.

Specifically recommended for use beneath Intersmooth HISOL.

- outstanding resistance to ice abrasion when missions call for such operations

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# Navy Shipbuilding — Update



(continued from page 16)

Appropriations bills are in committee mark-up process. A Continuing Resolution will provide defense funding until November 15 at FY 1983 levels. This action will allow further time for passage of FY 1984 Appropriations. Another Continuing Resolution will be necessary, should Congress be unable to meet the November 15 deadline.

Congress trimmed Navy budget request by almost 5 percent, reflecting across-the-board cuts imposed by the First Concurrent Budget Resolution. Exhibit I presents a breakdown of the requested versus authorized levels of Navy spending.

## Impact on Navy Shipbuilding Program

Congress has authorized new construction of 16 ships, conversion of five others, and acquisition of one from the British Navy in FY 1984. This program differs from the Administration request by:

- eliminating construction of one fleet oiler (TAO)
- reducing the number of mine countermeasures ships (MCM) from four to three
- adding one guided missile frigate (FFG)

Exhibit 2 compares the final Congressional authorization for Navy shipbuilding with the Administration's request.

## CG-47—Aegis Guided Missile Cruiser

Construction of three CG-47's has been authorized. This action brings to 12 the number of CG-47's authorized, with another 11 scheduled for FY 1985-88. A total of 27 CG-47's are planned.

## DDG-51—Arleigh Burke Class Guided Missile Destroyer

The DDG-51 program has drawn considerable Congressional attention. Issues involve estimated cost of each ship (\$700 million to in excess of \$1 billion), growth margins for future equipment, capabilities of the design, and requirements to be met by the ships. Specific questions have arisen over the lack of LAMPS III ASW helicopter facilities and inability to install Rankine Closed Energy Recovery (RACER) System in the first eight ships. Congress has requested a report from Navy addressing these issues and questions by November 1983.

## FFG-7—Guided Missile Frigate

Congress added an FFG-7 class ship to the Navy program. This action was taken because:

- it was felt the ship could be acquired relatively cheaply since the class is already in series production

- the additional ship would help preserve jobs in the shipbuilding sector

Congress reversed the Administration, stating that Navy has a validated requirement for more FFG-7's. Congress pointed to the distribution of recent Navy contracts (and lack of new commercial orders), stating this situation threatens to increase unemployment in shipbuilding.

## LHD-1—Amphibious Assault Ship

Congress authorized the \$1.4 billion requested for this modified version of the LHA design. Contract will be awarded to Ingalls on a sole source basis.

## LPD (SLEP)

Authorization for advance procurement funding of this program was denied. Navy planning has moved this program back by one year. Advance procurement funding will now be requested for FY 1985. The first actual SLEP is now scheduled to begin in FY 1986.

## LSD-41—Landing Ship Dock

Multiyear procurement of five ships over the next three years has been authorized. The Senate initially rejected multiyear procurement on grounds that budget constraints would prohibit full funding of the planned procurement. However, cost savings attributed to the multiyear program convinced the conference committee of the advantages of acquiring the ships under multiyear contracting.

## CV (SLEP)

Advance procurement funding for the FY 1985 SLEP of U.S.S. INDEPENDENCE was authorized in full.

## BB—Battleship (Reactivation)

Advance procurement funding for reactivation of U.S.S. MISSOURI was authorized in full.

The currently active battleship, U.S.S. NEW JERSEY has demonstrated a wide range of capabilities achievable through reactivation and modernization. However, questions have been raised with regard to the ship's role to support amphibious operations versus use as a strategic cruise missile platform. While continuing to support the program, Congress has requested a better definition of the role the BB will play in the fleet.

## SSBN—Trident Ballistic Missile Submarine

Authorization for construction of one OHIO class submarine was approved. Revised cost estimates submitted by Navy indicated that

(continued on page 20)

Exhibit I  
Procurement Authorizations for FY 1984 Navy Programs  
(in millions of dollars)

Program/Budget Item	Administration Request	Congressional Authorization	Difference
Aircraft Procurement (APN)	\$11,127	\$10,638	\$ - 489
Weapons Procurement (WPN)	4,029	3,903	- 126
Shipbuilding & Conversion (SCN)	12,699	12,045	- 654
Other Procurement (OPN)	5,002	4,498	- 504
Procurement, Marine Corps (PMC)	1,852	1,805	- 47
Total	\$34,709	\$32,889	\$ - 1,820

Source: Department of Defense Authorization Act, 1984 Conference Report, Aug. 15, 1983.

Exhibit 2  
Navy Shipbuilding and Conversion Authorizations, FY 1984

Budget Item	Administration Request		Congressional Authorization		Difference	
	Qty	Amount <sup>1</sup> (in millions)	Qty	Amount <sup>1</sup> (in millions)	Qty	Amount <sup>1</sup> (in millions)
CG-47 Aegis Guided Missile Cruiser	3	\$ 3,435.0	3	\$ 3,397.4	0	\$ - 37.6
DDG-51 <sup>3</sup> Guided Missile Destroyer	0	99.5	0	79.0	0	- 20.5
FFG-7 Guided Missile Frigate	0	0	1	300	+1	+ 300.0
LHD-1 Amphibious Assault Ship	1	1,379.7	1	1,379.7	0	0
LPD (SLEP) <sup>3</sup> Amphibious Service Life Extension Program	0	13.8	0	0	0	- 13.8
LSD-41 Landing Ship Dock	1	509.0	1	509.0	0	0
CV (SLEP) <sup>3</sup> Carrier Service Life Extension Program	0	95.9	0	95.9	0	0
BB <sup>3</sup> Battleship (reactivation)	0	57.7	0	57.7	0	0
SSBN Trident Ballistic Missile Submarine (nuclear)	1	1,832.1	1	1,759.0	0	- 73.1
SSN-688 Attack Submarine (nuclear)	3	2,042.4	3	2,042.4	0	0
MCM-1 Mine Countermeasures Ship	4	381.0	3	301.0	-1	- 80.0
MSH-1 Minesweeper Hunter	1	65.0	1	65.0	0	0
T-AO Fleet Oiler	3	\$ 524.6	2	\$ 365.4	-1	\$ - 159.2
T-AK <sup>3</sup> Cargo Ship (conversion)	0	.9	0	.9	0	0
T-AGS <sup>3</sup> Ocean Survey Ship (conversion)	0	34.5	0	34.5	0	0
T-AKR Fast Logistic Ship (conversion)	4	246.5	4	246.5	0	0
T-AH Hospital Ship (conversion)	1	260.0	1	260.0	0	0
T-AFS Combat Stores Ship (acquisition)	1	16.1	1	16.1	0	0
Service Craft <sup>4</sup>	—	119.3	—	119.3	—	0
Landing Craft <sup>4</sup>	—	15.0	—	15.0	—	0
LCAC <sup>5</sup>	6	161.1	6	161.1	0	0
Strategic Sealift <sup>5</sup>	9	31.0	9	31.0	0	0
Other <sup>2</sup>	—	1,378.7	—	809.5	—	- 569.2
Total	23	\$12,698.8	22	\$12,045.4	-1	\$ - 653.4

Notes:

<sup>1</sup>Amounts shown include advance procurement.

<sup>2</sup>Includes outfitting, post delivery, cost growth, escalation, transfers, and inflation adjustment.

<sup>3</sup>Denotes advance procurement for contract award in FY 1985.

<sup>4</sup>Quantity not specified.

<sup>5</sup>Quantity not included in total.

Source: Department of Defense Authorization Act, 1984 Conference Report, Aug. 15, 1983.

# Navy Shipbuilding — Update

(continued from page 19)

savings of \$73 million could be expected in this program. Congress reduced the authorized amount to reflect these savings. The ship is to be configured to carry the D-5 version of the Trident Missile.

## SSN-688—Nuclear Attack Submarine

Three SSN's have been authorized for FY 1984. Advance procurement of \$336 million has been authorized for later ships.

## MCM-I—Mine Countermeasures Ship

Three MCM's were authorized for FY 1984, a reduction of one from Navy's request.

The MCM design has experienced weight problems due to need for nonmagnetic, highly shock resistant equipment. MCM-I's hull design has been lengthened to accommodate increased weight. Also, Navy has reopened competitive procurement of diesel engines for the ship's propulsion.

## TAO—Fleet Oiler

Authorization of \$365.4 million eliminated one of the three ships requested by Navy. The reduction was made due to budget constraints. No significant problems have developed in the construction program.

## LCAC—Landing Craft Air Cushion

\$131.6 million was authorized for procurement of six LCAC's. Another \$29.5 million was authorized for advance procurement.

## Strategic Sealift

\$31 million was authorized for purchase of U.S. flag ships from the commercial fleet for use in the Ready Reserve Fleet. Notice of proposed purchases under this authorization are subject to Navy's notification of Congress before a 30-day continuous session of Congress.

## Restrictions Placed on Long-Term Leases for Ships

The MSC's Build/Convert and Charter Program came under detailed scrutiny in Congress last Spring. The T-AKX and T-5 tanker programs, totalling ten new constructions and eight conversions, have been the focus of concern over the use of operation and maintenance funds for acquisition of ships. As a result Congress established the following guidelines for future programs of this nature:

(1) Whenever a request is submitted to Congress for the authorization of the lease of an aircraft or naval vessel, the Secretary of Defense shall submit with that request an analysis of the cost to the

United States (including lost tax revenues) of any such lease arrangement compared with the cost to the United States of direct procurement of the aircraft or naval vessel by the United States.

Any such analysis shall be reviewed and evaluated by the Director of the Office of Management and Budget and the Secretary of the Treasury within 30 days after the date on which the request and analysis are submitted to Congress. The Director and Secretary shall conduct such review and evaluation on the basis of the guidelines issued pursuant to this Act and shall report to the Congress in writing on the results of their review and evaluation at the earliest practicable date, but in no event more than 45 days after the date on which the request and analysis are submitted to the Congress.

(2) Whenever a request is submitted to Congress for the authorization for funds for the Department of Defense for the long-term lease of aircraft or naval vessels authorized under this section, the Secretary of Defense—(A) shall indicate in the request what portion of the requested funds is attributable to capital-hire; and (B) shall reflect such portion in the appropriate procurement account in the request.

(3) The Director of the Office of Management and Budget and the Secretary of the Treasury shall issue jointly guidelines for determining under what circumstances the Department of Defense may use lease arrangements for aircraft and naval vessels rather than directly procuring such aircraft and vessels.

(4) Funds appropriated pursuant to an authorization contained in this Act may not be used to indemnify any person under the terms of a contract entered into with the United States for a lease that is authorized under this section—(A) for any amount paid or due by any person to the United States for any liability arising under the internal Revenue Code of 1954; or (B) to pay any attorney fees in connection with such contract.

(5) At the same time that the President submits the budget request for the Department of Defense to Congress for fiscal year 1985, the Secretary of Defense shall submit a written report to the Committees on Armed Services and on Appropriations of the Senate and House of Representatives concerning leases.

(6) During fiscal year 1984 obligation of funds for a lease authorized under this section that includes a termination liability in

excess of 50 percent of the original purchase value of the vessel, aircraft or vehicle is prohibited unless Congress has specifically provided budget authority for the obligation of 10 percent of such termination liability.

(7) Nothing in this section shall impede or affect the ability of the Secretary of the Navy to proceed to acquire the use of thirteen T-AKX class Maritime Prepositioning Ships and the use of five new T-5 tankers in accordance with the long term charter arrangements negotiated by the Navy before the date of enactment of this Act.

The conferees direct the Secretary of Defense to promptly report to the Committees on Armed Services of the Senate and House of Representatives any contract to lease of such contract: (A) is entered into between June 14, 1983, and the effective date of this section; and (B) would provide for indemnification of Federal tax liability of any person or would provide for indemnification of attorney's fees.

In effect, Congress permitted the Navy to proceed with the T-AKX and T-5 contracts. But Navy was told not to do it again—without our prior Congressional approval.

## 2. DEVELOPMENTS IN SHIPBUILDING PROGRAMS

Since June, the hospital ship (T-AH) has been contracted, several program changes have been announced, and four new programs have surfaced.

### T-AH—Hospital Ship (Conversion)

NAVSEA awarded initial contract for the T-AH to NASSCO in late June. The \$186 million contract calls for conversion of a San Clemente design tanker. NASSCO has chosen 92,000 DWT tanker, ROSE CITY, delivered in 1976, for conversion. Subcontracting is now underway. Delivery is scheduled for October 1986.

NASSCO's contract includes option for second conversion to be exercised in January 1984. Congress has authorized \$260 million for the second conversion, but funds are not yet appropriated.

### MSH—Mine Sweeper Hunter

This program has advanced through the first competitive design phase. Initial designs were submitted by four shipyards on August 15. The second round of competitive design will begin with award of detailed design contracts to two shipyards this fall.

Congress has authorized, but not yet funded, MSH lead ship award in FY 1984.

### DDG-51—Arleigh Burke Class Guided Missile Destroyer

Head of PMS 400, the office re-

## 1985 Defense Spending Program

Defense Program Decision Memoranda (PDM) issued August 22 mark the end of the POM process. These memoranda state the Deputy Secretary of Defense decision on size and composition of program funding for FY 1985.

As a result of the DoD review process, Navy is required to restructure \$800 million of planned spending in 1985. This action was imposed by the Deputy Secretary of Defense to reflect more realistic cost estimates and inflation adjustments.

Navy is instructed to start preliminary alternative designs of a new nuclear attack submarine. Several small ship programs proposed by Navy for FY 1985 have been deleted or deferred. Navy is ordered to deploy a fourth aircraft carrier abroad, reflecting the continued importance of the carrier task force in Navy planning. In recent past, Navy has had three carriers deployed—one each in the Pacific, Mediterranean and Indian Ocean.

These actions are forming the basis for the budget submission to Congress next January. Congress, of course, can impose changes.

sponsible for the CG-47 and DDG-51 programs, is now RAdm. D. Roane. He recently replaced RAdm. Wayne Meyer, who moved to NAVSEA 06 as Deputy Commander, Combat Systems Directorate.

The DDG-51 is currently in contract design stage. NAVSEA has organized a design team which includes numerous firms performing naval architecture, program support and systems design/modification. The three shipyards participating in this design effort are Bath, Ingalls, and Todd-L.A.

Award of lead ship contract is scheduled for early FY 1985. The RFP for lead ship contract is scheduled for release in Spring 1984. Construction awards scheduled for the first 29 ships through 1992 is shown in Table I.

DDG-51 design incorporates machinery, weapons, and a combat system similar to the CG-47 class cruiser. These systems are to be improved through design modifications. Phased introduction of upgraded systems into DDG-51 is scheduled for each of three flights over the next eight years.

Several major system upgrades are currently in design stage. They will also be incorporated into later ships of the CG-47 Aegis cruiser class. Upgrade 1, to be installed on the first flight of DDG-51 and the CG-62, includes a new digital control system and high power density reduction gear:

- design of the digital control

		Table I—DDG-51 Class Shipbuilding Program							
FY	85	86	87	88	89	90	91	92	
SHIPS	1	0	3	6	6	5	5	5	
HULL	DDG51		DDG52	DDG66	DDG60	DDG65	DDG70	DDG75	
FLIGHT 1			DDG53	DDG58	DDG61	DDG66	DDG71	DDG76	
			DG54	DDG67	DDG62	DDG67	DDG72	DDG77	
				DDG68	DDG63	DDG68	DDG73	DDG78	
				DDG68	DDG64	DDG68	DDG74	DDG79	
									FLIGHT 2
									FLIGHT 3

Source: NAVSEA

system is being handled by Bath. An RFP for procurement of the system is due in January 1984, with contract award scheduled for August 1984

- the RFP for the new high power density reduction gear was released September 2. Bids are due October 14 with contract award scheduled for Spring 1984

The second flight of DDG-51 construction will incorporate further equipment upgrades. Included will be:

- the Rankine Closed Energy Recovery (RACER) System
- a new 18 foot controllable-pitch propeller

Procurement schedules for these items have not yet been finalized.

Other DDG-51 program developments include:

- Sperry was recently selected as contractor for the AN/UYK-43 computer system for the ship

- Navy is currently developing a second source for the Vertical Launch System. FMC Northern Ordnance Division is likely to receive a directed second source contract for this system

#### Other Potential Shipbuilding Programs Have Surfaced

##### Naval Gunfire Support Ship

Congress authorized \$500,000, requesting Navy to investigate the potential of a Naval Gunfire Support Ship. This request grows out of concern that the trend towards missile armament on Navy ships has reduced Navy's capability in a critical amphibious support role.

##### Nuclear Attack Submarine

Navy will request funding in FY 1985 for design of new attack submarine (SSN). To incorporate new developments in hull strengthening, silencing, and underwater speed, new design may be ready for construction award in late 1980's.

##### Amphibious Cargo Dock—LKDX

Prefeasibility studies are being conducted on a concept design for a modified LSD-41. Top Level Requirement (TLR) is not yet formulated and no firm program is yet established. This concept may be substituted for the planned LPDX Program.

##### Army Amphibious Vessels and Craft

Army has developed plans to acquire several types of amphibious craft and support vessels, using

existing designs modified to meet the purchase specifications:

- Landing Craft Utility (LCU)—up to 50 of these 130+ ft. craft may be procured; several designs are being considered, including foreign designs from the Netherlands (Damen) and the U.K. (Rotork)

- Logistics Support Vessel (LSV)—four of these small ships (300 ft.) are to be procured over the next four years. The LSV is to

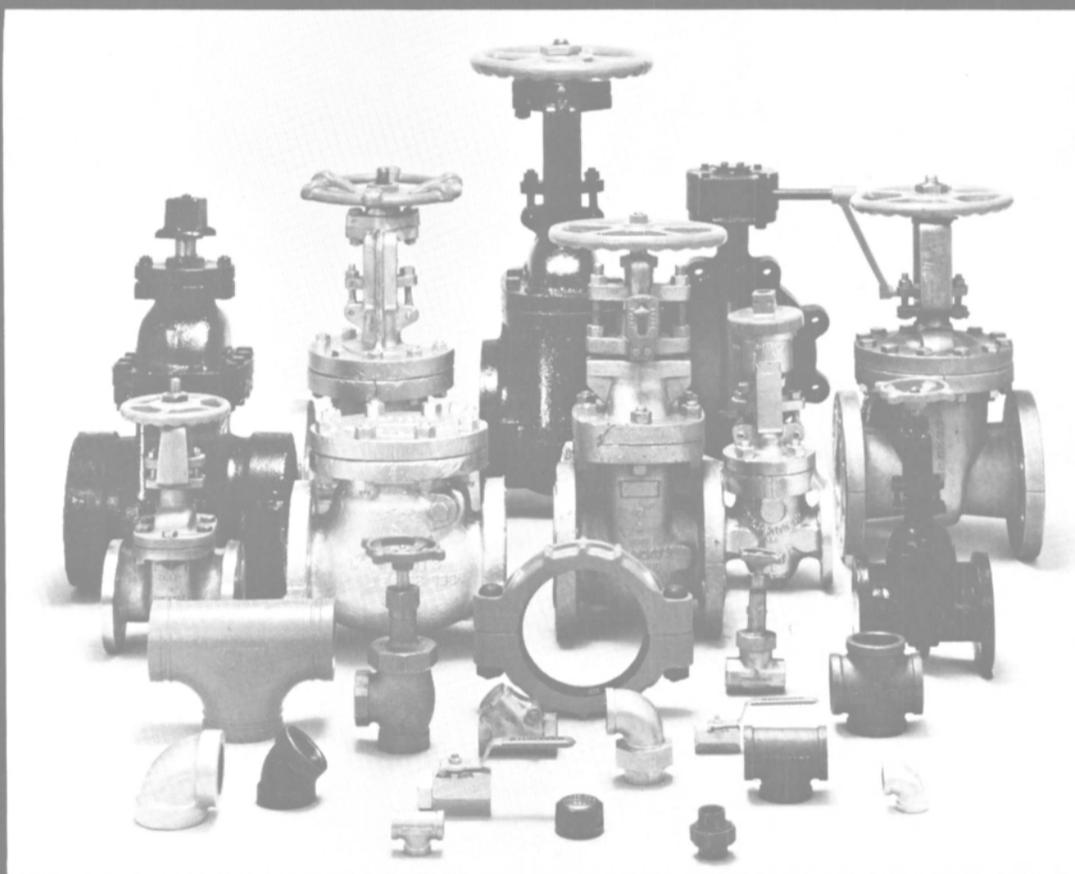
be a diesel powered, twin or triple screw vessel designed to carry a minimum of 2,000 short tons of cargo. It will have bow and stern ramps. Range must be 5,500 miles and a minimum speed of 12 knots is specified

- other craft include 20 large tugs, 20 small tugs, and 20 crew/patrol boats

Initial contract awards are scheduled for FY 1984.

(continued on page 23)

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# Navy Shipbuilding — Update



Exhibit 3  
Major Navy Contract Awards  
June–September 30, 1983

Award Date	Awarded To	Contract Value (million \$)	Description	Award Date	Awarded To	Contract Value (million \$)	Description
<b>Ship and Craft Construction</b>							
6/6/83	Ingalls Shipbuilding	926.1	3 CG-47 class cruisers to begin in July 1984 for delivery end of 1987	7/14/83	EDO Corp.	10.9	sonar equipment
6/29/83	NASSCO	186.2	convert tanker into hospital ship	6/20/83	Diagnostic Retrieval Systems, Inc.	4.7	sonar signal processing equipment
7/14/83	Marinette Marine	12.4	torpedo-retrieval craft	6/6/83	Raytheon Company	10.3	sonar sets
6/30/83	Watercraft Amer. Inc.	8.5	landing craft	6/2/83	N. American Philips Corp.	4.5	sonobuoys
<b>Ship Spares and Equipment</b>							
9/26/83	General Electric Co.	3.7	ship engine starters	6/2/83	Westinghouse Electric Corp.	4.2	sonar-detecting sets
8/23/83	Westinghouse Electric Corp.	3.9	nuclear propulsion parts	<b>Electronic Countermeasures</b>			
8/18/83	General Electric Co.	16.9	ship turbine generators and repair tubes for Navy and Air Force	8/11/83	Tracor Inc.	3.0	jamming chaff
6/16/83	Gould, Inc.	23.2	electronic gear with associated spare parts and engineering services	8/3/83	Eaton Corp.	15.5	tactical jamming system parts
6/15/83	Treadwell Corp.	6.4	refurbish electrolytic oxygen generators	<b>Communications Equipment</b>			
6/10/83	Platt Manuf. Corp.	15.2	engine cylinder assemblies to be used on carrier catapult systems	8/18/83	Tad Communications Co.	3.7	development work on joint tactical information distribution system
7/19/83	Maxima Corp.	4.5	product assurance technical work related to ships	6/21/83	Hughes Aircraft Co.	185.0	contract for tactical display systems
7/21/83	Amex Systems	4.3	equipment	7/5/83	Rockwell Int'l Corp.	5.5	engineer and install microwave link systems
6/23/83	Teledyne Mec.	3.1	microwave tubes	7/21/83	RCA Corp.	7.6	radio room for a Trident submarine and related services
<b>Ship Overhauls and Repair</b>							
6/22/83	Dillingham Shipyard	3.7	overhauling support ship	6/28/83	E-Systems, Inc.	30.1	communication systems on satellites TRW is building for Navy and Air Force
7/12/83	Norfolk Shipbldg. & Drydock	6.0	overhaul an amphibious ship	8/11/83	Rockwell Int'l Corp.	3.9	manufacture and test systems for communicating with submarines
7/1/83	Atlantic Drydock Corp.	4.1	work on frigate	7/6/83	Rockwell Int'l Corp.	5.3	communication transmitters and receivers
6/23/83	Hoboken Shipyards Inc.	14.3	overhaul a fleet oiler	7/26/83	Computer Sciences Corp.	8.3	programming services for Navy's data-automation command
6/20/83	Triple A South	10.5	overhaul on ammunition ship	7/5/83	Harris Corp.	17.1	radio sets
6/9/83	Triple A South	4.9	overhaul the repair ship Ajax	7/15/83	Analytical Tech. Application Corp.	4.6	development of technical data system
6/8/83	Newport News Shipbldg. & Drydock	97.6	overhaul, alter and repair the nuclear powered aircraft carrier Nimitz	7/1/83	Data Products New England	5.5	high-speed teleprinters
6/6/83	Jonathan Corporation	44.2	maintenance of a replenishment ship	6/1/83	CTE Corporation	6.7	upgrade a submarine communications transmitter facility
6/2/83	Southwest Marine, Inc.	7.4	work on two frigates	6/30/83	Western Electric Corp.	8.1	work on microwave communications link in Kuwait
9/8/83	GTE Corp	4.0	submarine electronics spare	9/13/83	Tektronix Inc.	4.2	radio analysis equipment
<b>Ship Navigation</b>							
9/29/83	Rockwell Int'l Corp.	13.5	gyroscopes	<b>Computers</b>			
9/20/83	Sperry	4.0	hydrofoil navigation equipment	9/26/83	Bendix Field Engin. Corp.	7.4	satellite computer equipment
9/19/83	Hycor Inc.	5.1	addition to Navy contract for chaff cartridges	9/22/83	EG&G Inc.	6.2	computer services
8/9/83	Teledyne Systems Co.	6.0	tactical navigation equipment	9/22/83	Control Data Corp.	77.7	computer services
7/11/83	Litton	18.5	Air Force and Navy contracts for advanced gyro compasses and oscillator tubes	6/28/83	Sperry	3.5	computers
8/8/83	Teledyne Systems Co.	1.7	navigation equipment	7/12/83	Rockwell Int'l Corp.	7.7	preproduction model of anti-submarine warfare info. processor
7/21/83	Rockwell Int'l Corp.	7.2	repair and modify ship inertial navigation systems	6/15/83	IBM Corp.	4.0	supply equipment for a radio-computer-tracking device
7/7/83	Litton	51.0	navigation parts and computers	6/15/83	Control Data Corp.	15.4	computer systems
7/7/83	Litton	74.6	Army and Navy contracts for inertial navigation elements, related computers and position-determining systems	8/24/83	Planning Research Co.	6.7	systems analysis, software and logistics services for an intelligence-processing system
6/15/83	Litton	14.2	inertial-navigation units control display equipment, etc.	7/25/83	Sperry	3.1	provide spare parts for computer
8/23/83	Litton	3.4	inertial navigation units	6/29/83	Computer Consoles, Inc.	3.8	office automation equipment
<b>Radar</b>							
9/21/83	General Electric Co.	19.1	addition to Navy contract for radar spare parts	<b>Ship Engineering Services</b>			
9/7/83	General Electric Co.	87.7	addition to contract for shipboard radars	9/29/83	TRW Inc.	7.7	computer services & advanced electronic design (Navy & Air Force)
6/30/83	Raytheon Co.	5.7	target detection radar	9/29/83	General Dynamics Corp.	58.1	submarine design services (includes an Army contract)
8/16/83	Raytheon Co.	14.3	radar and spare parts	9/27/83	Bath Iron Works Corp.	6.2	testing new ships
8/2/83	ITT Gilfillan	44.0	radar systems	8/31/83	Automation Industries Inc.	5.9	engineering services in support of fleet ballistic missile program
7/22/83	Ford Aerospace Comm. Corp.	26.9	spare parts for infrared radar	8/30/83	Sperry	4.9	engineering design of radar equipment
7/11/83	Norden Systems, Inc.	14.4	radar equipment and conversion of radars	8/27/83	General Dynamics Corp.	62.0	supply design services for advanced Trident missile submarine
7/8/83	Applied Tech.	6.5	production of radar warning receive systems	8/25/83	Sanders Associates Inc.	12.0	engineering development of antisubmarine surveillance equipment
<b>Sonar</b>							
9/13/83	Gould Inc.	7.1	sonar equipment	(Exhibit 3 continues on page 24)			
8/9/83	IBM Corp.	15.0	submarine detection equipment				

(continued from page 21)

### 3. CONTRACTS

Since June 1983, Navy has awarded over 200 major contracts with a total value exceeding \$5.8 billion. Twelve major U.S. defense contractors have received more than 75 percent of the value of these awards:

- Litton
- McDonnell Douglas
- Lockheed
- United Technologies
- Westinghouse Electric
- Grumman
- Hughes Aircraft
- Raytheon
- IBM
- General Electric
- General Dynamics
- Morrison-Knudsen

Exhibit 3 lists major Navy contracts awarded between June 1 and September 30 as announced by the Department of Defense and published in the *Wall Street Journal*. The list is not comprehensive, but has been arranged to include contracts for ships, systems, weapons, and services. Aircraft-related contracts are not included.

**EDITOR'S NOTE:** Since the mid-1960's, 100% of all new U.S. Navy vessels (and some for Allies) have been constructed in privately owned shipyards (the prime contractors). About 30- to 35% of Navy repair and overhaul work is also accomplished in civilian yards. The Naval Shipyards perform no new construction work.

Almost all, if not all, of the nation's leading naval architectural firms (private corporations) have been engaged, to a great degree, in naval work for decades. Most of the individuals (civilians) in both the shipbuilding and design areas who have been responsible for the selection and purchase of equipment and services for private shipbuilding projects are the same private individuals now responsible where naval work is concerned.

There is a clear and important distinction, between what is known as GFE (government-furnished equipment) and CFE (contractor-furnished equipment). When the Navy awards a contract to a private shipbuilder (the prime contractor) for construction of, say, a nuclear-powered aircraft carrier it will normally specify in detail what systems, subsystems, and equipment items will be built or purchased by the prime contractor (the private yard) (CFE) and what will be built or purchased by the government and provided to the prime contractor (GFE).

The shipyard, as prime contractor, has the authority to choose one supplier over another where contractor furnished equipment (CFE) is concerned.

For example, the total contract price for the two carriers, CVN 72 and 73, is approximately \$6.7 billion. Government **Furnished**

Equipment (GFE) is *not* included in this figure.

Of the \$6.7 billion, approximately \$2.2 billion will be used for normal shipyard operating expenses such as salaries, etc. Therefore, the shipyard, a private company staffed and managed by civilians, has the discretionary authority to spend in the

neighborhood of about \$4.5 billion with sub-contractors and suppliers—about two-thirds of the money.

The dominant role played by commercial shipyards and civilian personnel in the construction of Naval vessels and the selection and purchase of equipment cannot be over-emphasized.



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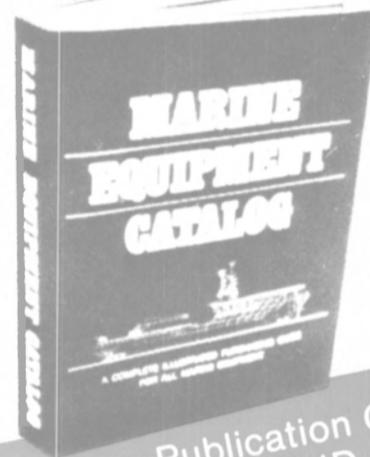
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# Navy Shipbuilding — Update



(Exhibit 3 continued from page 22)

Award Date	Awarded To	Contract Value (million \$)	Description	Award Date	Awarded To	Contract Value (million \$)	Description
8/18/83	Scientific Management	4.4	technical and engineering work	6/9/83	Lockheed Corp.	455.4	trident submarine missiles
8/18/83	Sperry	4.5	technical and engineering work in analyzing new concepts for Frigate weapons	6/1/83	General Dynamics Corp.	5.0	provide equipment for cruise missiles
8/2/83	Computer Data Systems, Inc.	9.9	services used in design, testing and evaluation of authorized data processing equipment	8/19/83	General Dynamics Corp.	6.7	guidance equipment for ground and sea-launched cruise missiles
8/3/83	Westinghouse Electric Corp.	30.0	engineering development of VLS for tomahawk cruise missiles	8/12/83	Lockheed Corp.	15.2	materials and parts used in Trident missiles
7/22/83	EG&G Washington Analytical Services Ctr., Inc.	5.9	technical and engineering service in Trident program	8/2/83	Westinghouse Electric Corp.	30.0	vertical launch system for Tomahawk cruise missiles
7/7/83	Texas Instruments	4.8	technical and engineering work on electro-optical sensor equipment	8/5/83	McDonnell Douglas Corp.	10.0	assembly of Tomahawk cruise missiles
6/24/83	Texas Instruments	4.8	furnish technical and engineering services and other work in connection w/ electro-optical sensor systems	<b>Gun Fire and Control Systems</b>			
6/10/83	Bendix Corp.	4.4	engineering and technical services dealing with a super-high-frequency satellite-communication system	9/26/83	FMC Corp.	5.1	shipboard gun-mount equipment
6/2/83	Syscon Corporation	6.6	provide engineering support for the AEGIS fleet-air-defense-cruiser project	8/16/83	Varian Associates	3.5	electron tubes for gunfire-control equipment
8/24/83	Tracor Inc.	20.0	test and evaluation of communications and other electronic systems	6/11/83	General Dynamics Corp.	4.6	provide materials for changes in Phalanx air defense gun system
6/16/83	Comptek Research, Inc.	4.1	software engineering	<b>Submarine Warfare Systems</b>			
8/11/83	Westinghouse Electric Corp.	9.7	development work related to Trident missile	7/18/83	IBM Corp.	24.9	provide materials for development of advanced combat system for submarines
7/15/83	Automation Ind. Inc.	36.1	engineering work and computer design to update Tar for missile system	8/19/83	Yardney Electric Corp. Unit of Whittaker Corp.	4.7	batteries for underwater missiles
6/8/83	McDonnell Douglas Corp.	3.6	support work on the Tomahawk cruise missile	7/5/83	Goodyear Corp.	3.9	refurbish submarine-launched rockets
6/27/83	Harris Corp.	5.3	oceanographic research	8/1/83	Goodyear Corp.	9.7	Mark 48 torpedo warheads and related equipment
8/31/83	Penn Central Corp.	5.9	engineering services for fleet ballistic missile program	<b>Other Weapons Systems and Equipment</b>			
<b>Support and Test Equipment</b>				6/29/83	Hughes Aircraft Co.	7.9	weapons control consoles and related equipment
9/15/83	F.E. Basil and Burns & Roe	5.6	support of the Diego Garcia naval facility in the Indian Ocean	8/26/83	McDonnell Douglas Corp.	3.1	missile radar altimeter-test assemblies
8/2/83	Sperry	20.7	operate land-based center for combat systems used on frigates	7/29/83	General Electric Co.	13.2	Navy and Air Force contracts for armor-piercing ammunition, development work on advanced turbine engine gas generator and spare parts for radar land mass simulators
7/11/83	Sperry	7.2	portable elect. test equipment	6/23/83	Varo, Inc	9.8	guided missile launchers to be used aboard ships
6/20/83	Tektronix Inc.	11.2	spectrum analyzers for use in electronic test equipment	9/8/83	Motorola Inc.	9.8	missile-guidance systems
8/30/83	Randolph Engineering Inc.	4.4	provide equipment for an anti-submarine warfare operations center	9/12/83	General Dynamics Corp.	97.0	repair parts for Navy guns
9/7/83	Logicon Inc	3.8	provide technical services and systems analysis for a year	<b>Other</b>			
7/1/83	RCA Corp.	38.1	engineering work on combat system for new class of guided missile destroyers	9/30/83	Western Electric Co.	6.1	oceanographic systems
<b>ASW (Anti Submarine Warfare) Systems</b>				9/30/83	Dravo/J.E. Serrine Co.	106.0	design, engineer & build a waste-to-energy industrial power plant at Norfolk Naval Shipyard
8/23/83	IBM Corp.	25.5	antisubmarine weapons systems	9/29/83	Computer Sciences Corp.	37.5	automated data processing support services
8/17/83	General Electric Co.	5.7	development of antisubmarine warfare control system software	9/28/83	Raytheon Co.	8.0	ship electronics equipment
6/6/83	Goodyear Corp.	3.7	raw materials to be used in the Captor antisubmarine mine torpedo system	9/27/83	Dynallectron Corp.	17.6	test-range instruments
<b>AAW (Anti Aircraft Warfare) Systems</b>				9/26/83	Uniroyal Inc.	4.1	airfield fuel dispensing systems
6/11/83	Texas Instruments	6.0	Harm anti-radar missiles	9/23/83	Terex Corp.	4.8	tractors
7/12/83	Texas Instruments	8.0	Harm anti-radar missiles	9/22/83	Western Electric Co., unit of American Tel. & Telegraph	4.2	oceanographic research
8/15/83	General Dynamics Corp.	10.9	material to be used in production of Phalanx air-defense systems	9/22/83	Raytheon Co.	50.0	electronic spare parts
6/23/83	Varian Assoc. Inc.	7.4	amplifiers and spare parts to be used in support of AEGIS fleet air defense radar system	9/22/83	FMC Corp.	45.6	addition to Navy contract for amphibious vehicles
6/23/83	General Dynamics Corp.	9.2	special tooling and test equipment for standard missile	9/19/83	Rockwell Int'l Corp.	3.1	torpedo targets
8/12/83	General Dynamics Corp.	40.0	materials used in producing standard missiles	9/15/83	MTS Systems Corp.	9.3	metal-working equipment
7/27/83	General Dynamics Corp.	26.6	Sparrow missile guidance and control sets	7/29/83	Martin Marietta Corp.	6.2	laser-tracker spare parts
<b>Long Range Missiles</b>				8/19/83	Texas Instruments	11.6	Army and Navy night-sight equipment and infrared receivers
9/14/83	Lockheed Corp.	4.0	submarine missile warheads	6/22/83	Rockwell Int'l Corp.	10.8	receivers
7/7/83	Williams Int'l Corp.	48.1	cruise-missile engines	7/12/83	Sperry	6.7	submarine periscope equipment
6/10/83	Williams Int'l Corp.	6.1	cruise missile engines	6/29/83	Raytheon Co.	3.9	electrical repair parts
				6/8/83	General Electric Co.	60.9	electronics systems for ships
				6/3/83	TRW, Inc.	3.5	upgrade the ocean-surveillance info. system
				8/12/83	Science Management Corp.	4.2	operate and maintain military-personnel records system
				8/1/83	RCA Corp.	22.6	Army and Navy contracts for multiplex terminals, for engineering work on remote sensor systems for physical security, and for spare parts for a technical control and analysis system

**MonArk Boat Builds  
Buoy Tending Barge  
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MonArk model 4014 barge built for the C.O.E., Savannah, Ga., is powered by twin 6V53 Detroit Diesels.

A MonArk model 4014 barge has been purchased by the Savannah (Georgia) District of Engineers from the MonArk Boat Company, Monticello, Ark.

The boat was designed and constructed especially for the Corps of Engineers for use in tending more than 600 buoys on Lake Hartwell. It is also capable of transporting a fire plow and tractor, plus other maintenance equipment.

The 4014 features lightweight aluminum hull design, a removable cabin for low bridge clearance, davits for setting and maintaining buoys, and twin 6V53 Detroit Diesel Engines.

MonArk produces a wide variety of stock and custom-designed aluminum hull workboats which are in use worldwide.

For more information,

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**Wartsila Diesels To Power  
Sonat Semisubmersible  
—Literature Available**

Wartsila Diesel of Finland has received the engine order for Sonat Offshore Drilling's new semisubmersible oil rig, the Henry Goodrich. The contract includes delivery of five heavy fuel diesel engines of the Wartsila Vasa 32 type.

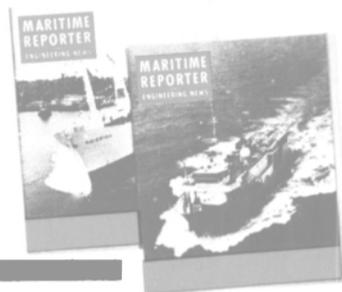
The new Sonat rig will be equipped with four twelve-cylinder Vasa 32 generating sets with a total output of 23,400 bhp and one six-cylinder 2,690-bhp emergency unit of the same engine type. The engine choice was based on extensive analyses to determine maximum operational flexibility, safety and economy in any environment. The Wartsila Vasa 32 engine represents a new generation of diesel engines designed and developed from the outset to operate on low quality heavy fuel.

The four-stroke engine is, without any load limitations, capable of burning low-quality heavy fuel with substantial impurities and a viscosity up to 700 cSt at 50°C. The heavy fuel capability in combination with unique design features give the engine especially good fuel consumption rates as well as superior overall economy. The Vasa 32 engine is manufactured in both in-line and V-form designs in seven different cylinder versions ranging in output from 2,010 to 9,180 bhp at 720-800 rpm.

November 15, 1983

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## Blount Marine Gets Orders For Three New Vessels

Blount Marine Corporation of Warren, R.I., recently announced the signing of three new vessel contracts. Westferry, Inc. of New York has ordered an 85-foot by 20-foot by 4-foot 11-inch all-welded, aluminum, passenger commuter vessel for operation on Great South Bay, Long Island. This 375-passenger, triple-screw vessel will be powered by three GM Detroit Diesel 12V-71TI engines totaling 1,530 bhp. Construction is similar to the

previously delivered 75-foot Fireball. The new vessel will be certified under U.S. Coast Guard Rules and Regulations for Small Passenger Vessels, Subchapter T. Delivery is scheduled for April 1984.

Two large dinner boats have also been ordered. Holiday Cruises of Norfolk, Va., has signed a contract for one of the New Spirit Class but of a new styling (see rendering). This vessel will be 145 feet long with a beam of 32 feet 4

inches and design draft of 6 feet. This is the second dinner boat built by Blount Marine for Holiday Cruises; the first was the New Spirit delivered in May 1983.

The new Holiday vessel will carry up to 600 passengers for dinner cruises, on two completely enclosed decks and a third open deck. Main propulsion will be by two GM Detroit Diesel 8V-71N engines; electric power will be provided by two 75-kw generators. Delivery is expected in April 1984.

A similar dinner cruise vessel has been ordered by World Yacht Enterprises, Ltd. of New York. This vessel will be a sister ship of the Holiday Cruises boat, with delivery also scheduled for April 1984. These two dinner boats will be the ninth and tenth constructed by the Blount yard. Vessels of this type are in operation on the East Coast, Gulf of Mexico, Mississippi River, and Great Lakes.

Blount Marine Corporation hopes the new modern styling of these dinner cruise vessels will increase

public acceptance of this form of dining-cruising.

## Newport News Awarded \$11.7-Million Navy Contract

Newport News Shipbuilding Company, Newport News, Va., has been awarded a \$17,063,000 cost-plus-fixed-fee contract to prepare for the overhaul and refueling of USS Benjamin Franklin (SSBN-640). The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

## PIMA Established As Shipbuilding/Repair Agents



Louis W. Gomlick

Louis W. Gomlick, president, announces the formation of Penn International Marine Agencies, Ltd. (PIMA) for the purpose of representing American and foreign shipbuilding and ship repair facilities and companies manufacturing and servicing marine equipment. Clifford R. Wise has been appointed managing director.

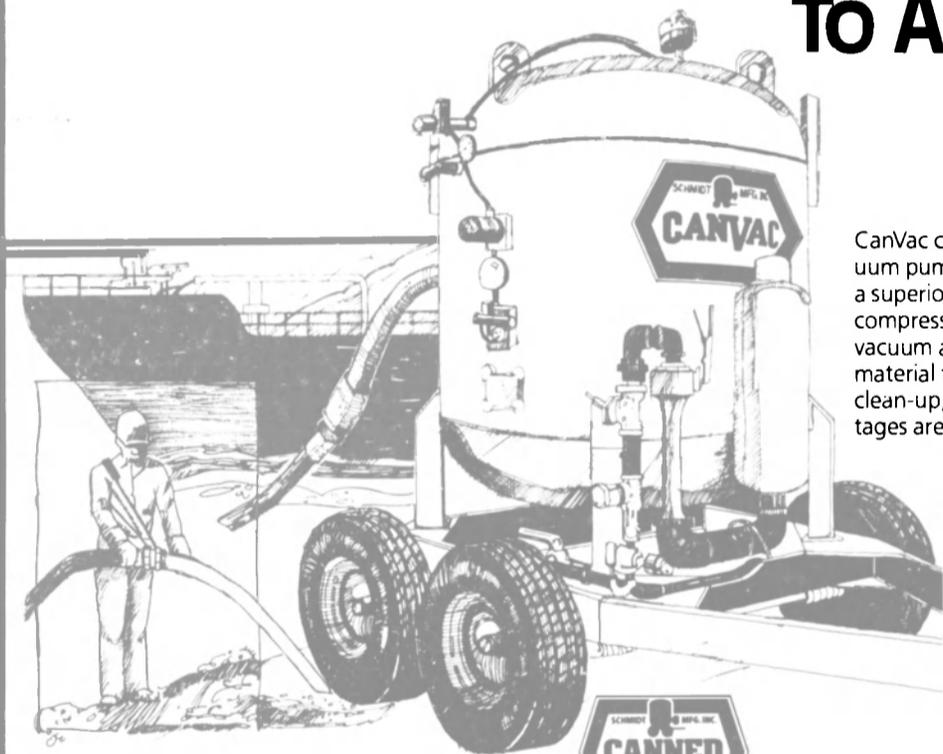
In order to provide full service to the Agencies constituents, PIMA has established subagents in Beaumont, Texas, and San Francisco, Calif. Trio Leasing & Rentals, James Finger, marketing manager, will represent PIMA in the U.S. Gulf area, including the offshore industry, and H.P. (Bud) Stewart, independent consultant, will be the U.S. West Coast agent.

PIMA has also established a worldwide network of 22 foreign agents covering 40 countries and has been appointed exclusive agent for the following companies:

Braswell Shipyards Inc., Charleston, S.C.; Hoboken Shipyards Inc., Hoboken, N.J.; Boland Marine & Mfg. Co., New Orleans, La.; Falmouth Ship Repair, Falmouth, England; Grangemouth Dockyard Ltd., Grangemouth, Scotland; Tyne Shiprepair Ltd., South Shields, England; Vospers Shiprepairs, Southampton, England; Europax Consultants Ltd., Colchester, England; Harris Pye Marine, Ltd., South Wales, U.K.; Marine Engines Specialties, Staten Island, N.Y.; Mecanique Etang Service, Port De Boue, France; River and Offshore Service, Violet, La.; S.M.E.B. Cantiere Navale SpA, Messina, Italy; Steamco Corp., New York, N.Y.; SUD Marine Enterprises, Marseille, France; and Violet Dockport, Violet, La.

Messrs. Gomlick, Wise, Finger and Stewart are all former employees of Bethlehem Steel Corp., Shipbuilding Division.

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## Jack Schmidt Joins Thunderbolt Marine As General Manager



Jack Schmidt

Jack Schmidt has recently joined Thunderbolt Marine, Inc. as general manager and will be responsible for overall yard operations. Mr. Schmidt comes to TMI

from Tracor Marine, Inc., Port Everglades, Fla., where he was employed as production manager. He began his career as an apprentice at Puget Sound Naval Shipyard, Bremerton, Wash., and brings 20 years' experience to TMI in both repairs and construction.

Thunderbolt Marine, Inc., a wholly owned subsidiary of Latex Construction Company, is located near Savannah, Ga. on the Intercoastal Waterway. The company is capable of both aluminum and steel construction. TMI has a 1,250-ton syncrolift, a barge launching facility using steel rollers and a tilting cradle, with construction already started on a side launch ways; a rail transfer system that allows 20 vessels to be drydocked simultaneously and four wet berths of 467, 307, 368, and 240 feet.

## U.S. And Canadian Companies Licensed To Build Vickdock

U.S. and Canadian companies have been licensed to manufacture a range of floating drydocks that operate on the submarine principle of using compressed air to blow water from their ballast tanks.

Ammac Welding and Machine Works of Wilmington, Calif., has acquired license rights to build the Australian-design Vickdock, the largest version of which handles vessels of up to 300 tons. Mantle Industries of Delta, British Columbia, Canada, has acquired the rights for both the manufacturing and marketing of the docks, which can raise a 30-ton vessel in 15 minutes and a 100-ton vessel in 35 minutes.

Vickers Cockatoo Dockyard, a member of the British Vickers group of companies and located in Sydney, Australia, has appointed Giannotti & Associates of Houston as manufacturer's agent in the United States and Canada for the Vickdocks. All sales inquiries and administration of orders will be handled by the Giannotti firm.

The docks, which operate faster

than conventional drydocks that use pumps to empty their ballast tanks, are operated by one man. A docked vessel is supported by stressed beams and girders attached to the ballast tanks, giving an unobstructed working space without cradle arms and supports blocking the dock floor.

The Vickdock, which does not require supporting shore-based equipment and can be moved readily from mooring to mooring, is aimed particularly at operators of workboats and fishing vessels, and at owners of pleasure craft marinas. Versions are used by similar vessels in Australia and Southeast Asia, including workboats servicing offshore oil rigs.

"A 39-foot yacht can be lifted, cleaned and re-landed within 90 minutes using the Vickdock, so it should be well possible to handle five or six vessels in a day," said Graham Cole, a Vickers spokesman.

For additional information on the Vickdock,

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Unique floating drydock that uses compressed air to blow water from its ballast tanks will be built by companies in the U.S. and Canada.

## \$22.2-Million Navy Contract Awarded To Raytheon

Raytheon Company, Portsmouth, R.I., has been awarded a \$22,200,000 firm-fixed-price contract for six AN/SOS-56 sonars and related engineering services. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

## Victor Atkins Retires As Lips Propellers CEO

A spokesman for Lips Propellers (formerly Doran Company and Lips Doran) reported recently that Victor K. Atkins, the firm's chief executive officer, has retired. His position has been filled by Robert F. Kress, formerly president of Lips Propellers.

In 1942, Mr. Atkins graduated from the U.S. Naval Academy with a B.S. degree. After serving as a submarine officer during World War II, he attended the Massachusetts Institute of Technology and received an M.S. degree in 1947.

From 1947 to 1950 he worked as a manufacturing and engineering executive at Paccar, Inc., Seattle. In 1951 he purchased the Oakland, Calif. operations of the Doran company.

In 1962, Mr. Atkins formed a partnership with Lips BV, a Netherlands-based organization specializing in the manufacture and repair of large propellers and other propulsion equipment. In 1970 Lips acquired the remainder of the company. Mr. Atkins continued to be president and chief executive officer until his retirement.

## General Ship Awarded Navy Overhaul Contract

General Ship Corporation, East Boston, Mass., is being awarded a \$706,978 firm-fixed-price contract with an \$8,085,369 option for the regular overhaul of USS Jesse L. Brown (FF-1089). The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N62665-81-C-0001).

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# DIRECTORY OF NAVAL SUPPLIERS

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- Marine Windshield Mfg. Co.  
1702 Commerce Blvd., Sarasota, FL 33580
- Commercial Division, Masonite Corp.  
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P.O. Box 72, Colville, WA 99114
- Danfoss, Inc.  
16 McKee Drive, Mahway, NJ 07430
- Foster Refrigerator of Canada Ltd.  
333 Janelle Street, Drummondville,  
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- Graham Manufacturing Co., Inc.  
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- Mechanical Resources, Inc.  
191 Cambridge Ave., Jersey City, NJ 07307
- Nance Industries  
P.O. Box 1547, Beaumont, TX 77704
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329 Herzl Street, Brooklyn, NY 11212
- Robichaux's Marine-Air, Inc.  
1314 27th St., Kenner, LA 70062
- Tomlinson Refrigeration & Supply Co.  
324 Broadway, Elizabeth, NJ 07206
- York-International, Borg-Warner Corp.  
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- Marine & Industrial Resins  
6183 Ft. Caroline Rd., Jacksonville FL
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P.O. Box 454, 20 Commerce Drive,  
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- Activation Marine Systems, Int'l.  
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- American Hydromath Co.  
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Germantown, NY 12526
- AMOT Controls Corp.  
P.O. Box 1312, Richmond, CA 94802
- ARMTEC Industries, Inc.  
Manchester, NH 03103
- ASEA Inc., Hagglund Products Division  
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- Automation Products, Inc.  
3030 Max Roy St., Houston, TX 77008
- Autronica Marine, USA Inc.  
234 Industrial Parkway, Northvale, NJ 07647
- Avicon Corporation  
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- Beckman Instruments Inc. Cedar Group Operation  
80 Commerce Road, Cedar Grove, NJ 07009
- B.I.E. Instruments, Inc.  
2100 West Loop South, Houston, TX 77027
- Biospherics Incorporated  
5001-F Forbes Blvd., Lanham/Seabrook, MD 20852
- CEC Division/Bell & Howell  
360 Sierra Madre Villa, Pasadena, CA 91109
- Commodities Recovery Corp.  
150 Fifth Ave., New York, NY 10011
- Dynalco Corporation  
P.O. Box 8187, Ft. Lauderdale, FL 33310
- Eldec Corp.  
16700 13th Ave. W, P.O. Box 100, Lynwood, WA  
98036
- Energy Incorporated  
One Energy Drive, P.O. Box 736, Idaho Falls, ID
- En-Tronic Controls (Div. Cooper Energy Services)  
North Sandusky St., Mt. Vernon, OH 43050
- Eugene Ernst Products Co.  
South Main St., Box 427, Farmingdale, NJ 07727
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78 Blanchard Road, Burlington, MA 01803
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- Total Transportation Systems, Inc.  
813 Forrest Dr., P.O. Box 6127, Newport News, VA  
23606
- Transamerica Delaval Inc.  
Gems Sensors Division, Cowles Road,  
Plainview, CT 06062
- Victor Fluid Power  
7525 Mitchell Road, Suite 205,  
Eden Prairie, MN 55344
- WABCO Fluid Power Division/American Standard  
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- Custom Cable Company  
5310 Glenmount, Houston, TX 77081
- Disco International  
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2475 N.W. 38th St., Miami, FL 33142
- Loos & Co. Inc.  
Tr. 101, P.O. Box 98, Pomfret, CT 06258
- Samson Ocean Systems, Inc.  
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- Tubbs Cordage Company  
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- Wall Industries, Inc.  
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William St., P.O. Box 49, Haskell, NJ 07420
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P.O. Box 55343, Houston, TX 44255
- American Abrasive Metals Co.  
460 Coit Street, Irvington, NJ 07111
- Anker Marine Paints, Inc.  
29 Broadway, New York, NY 10006
- Apache Abrasives, Inc.  
10690 Shadow Wood, Suite 112,  
Houston, TX 77043
- Aurand Mfg. & Equipment Co.  
1210 Ellis Street, Cincinnati, OH 45223

## Jack Schmidt Joins Thunderbolt Marine As General Manager



Jack Schmidt

Jack Schmidt has recently joined Thunderbolt Marine, Inc. as general manager and will be responsible for overall yard operations. Mr. Schmidt comes to TMI

from Tracor Marine, Inc., Port Everglades, Fla., where he was employed as production manager. He began his career as an apprentice at Puget Sound Naval Shipyard, Bremerton, Wash., and brings 20 years' experience to TMI in both repairs and construction.

Thunderbolt Marine, Inc., a wholly owned subsidiary of Latex Construction Company, is located near Savannah, Ga. on the Intercoastal Waterway. The company is capable of both aluminum and steel construction. TMI has a 1,250-ton syncrolift, a barge launching facility using steel rollers and a tilting cradle, with construction already started on a side launch ways; a rail transfer system that allows 20 vessels to be drydocked simultaneously and four wet berths of 467, 307, 368, and 240 feet.

## U.S. And Canadian Companies Licensed To Build Vickdock

U.S. and Canadian companies have been licensed to manufacture a range of floating drydocks that operate on the submarine principle of using compressed air to blow water from their ballast tanks.

Ammac Welding and Machine Works of Wilmington, Calif., has acquired license rights to build the Australian-design Vickdock, the largest version of which handles vessels of up to 300 tons. Mantle Industries of Delta, British Columbia, Canada, has acquired the rights for both the manufacturing and marketing of the docks, which can raise a 30-ton vessel in 15 minutes and a 100-ton vessel in 35 minutes.

Vickers Cockatoo Dockyard, a member of the British Vickers group of companies and located in Sydney, Australia, has appointed Giannotti & Associates of Houston as manufacturer's agent in the United States and Canada for the Vickdocks. All sales inquiries and administration of orders will be handled by the Giannotti firm.

The docks, which operate faster

than conventional drydocks that use pumps to empty their ballast tanks, are operated by one man. A docked vessel is supported by stressed beams and girders attached to the ballast tanks, giving an unobstructed working space without cradle arms and supports blocking the dock floor.

The Vickdock, which does not require supporting shore-based equipment and can be moved readily from mooring to mooring, is aimed particularly at operators of workboats and fishing vessels, and at owners of pleasure craft marinas. Versions are used by similar vessels in Australia and Southeast Asia, including workboats servicing offshore oil rigs.

"A 39-foot yacht can be lifted, cleaned and re-landed within 90 minutes using the Vickdock, so it should be well possible to handle five or six vessels in a day," said **Graham Cole**, a Vickers spokesman.

For additional information on the Vickdock,

Write 11 on Reader Service Card



Unique floating drydock that uses compressed air to blow water from its ballast tanks will be built by companies in the U.S. and Canada.

## \$22.2-Million Navy Contract Awarded To Raytheon

Raytheon Company, Portsmouth, R.I., has been awarded a \$22,200,000 firm-fixed-price contract for six AN/SOS-56 sonars and related engineering services. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

## Victor Atkins Retires As Lips Propellers CEO

A spokesman for Lips Propellers (formerly Doran Company and Lips Doran) reported recently that **Victor K. Atkins**, the firm's chief executive officer, has retired. His position has been filled by **Robert F. Kress**, formerly president of Lips Propellers.

In 1942, Mr. Atkins graduated from the U.S. Naval Academy with a B.S. degree. After serving as a submarine officer during World War II, he attended the Massachusetts Institute of Technology and received an M.S. degree in 1947.

From 1947 to 1950 he worked as a manufacturing and engineering executive at Paccar, Inc., Seattle. In 1951 he purchased the Oakland, Calif. operations of the Doran company.

In 1962, Mr. Atkins formed a partnership with Lips BV, a Netherlands-based organization specializing in the manufacture and repair of large propellers and other propulsion equipment. In 1970 Lips acquired the remainder of the company. Mr. Atkins continued to be president and chief executive officer until his retirement.

## General Ship Awarded Navy Overhaul Contract

General Ship Corporation, East Boston, Mass., is being awarded a \$706,978 firm-fixed-price contract with an \$8,085,369 option for the regular overhaul of USS Jesse L. Brown (FF-1089). The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N62665-81-C-0001).

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Loos & Co. Inc.  
Tr. 101, P.O. Box 98, Pomfret, CT 06258  
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Tubbs Cordage Company  
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Apache Abrasives, Inc.  
10690 Shadow Wood, Suite 112,  
Houston, TX 77043  
Aurand Mfg. & Equipment Co.  
1210 Ellis Street, Cincinnati, OH 45223

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Circle Chemical Company, Inc.  
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Contact Paint & Chemical Corp.  
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1100 Walnut Street, Roselle, NJ 07203

CPR Division of the Upjohn Company  
555 Alaska Avenue, Torrance, CA 90503

Devoe Marine Coatings Co.  
4000 DuPont Circle, Louisville, KY 40207

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

E.I. du Pont de Nemours & Co.  
F & FP Department — Marine Finishes  
Wilmington, DE 19898

Dupont Starblast  
Wilmington, DE 19898

Engelhard Corporation  
2655 U.S. Rte. 22, Union, NJ 07083

Eureka Chemical Company  
P.O. Box 2205, South San Francisco, CA 94080

Fabtek, Inc.  
30 Mill Street, Healdsburg, CA 95448

The Farboil Company  
8200 Fischer Road, Baltimore, MD 21222

Gamlen Chemical Company  
375 Allwood Road, Clifton, NJ 07013

Global Cathodic Protection, Inc.  
5826 Schumacher, Houston, TX 77057

Harben Inc.  
Route 10, Box 163, Cumming, GA 30130

Hempel's Marine Paints, Inc.  
65 Broadway, New York, NY 10006

Hydro-Manufacturing  
P.O. Box 308, Missouri City, TX 77459

International Paint Company, Inc.  
P.O. Box 386, 2270 Morris Ave., Union, NJ 07090

IPEC  
1 Sawyer Drive, Coventry, RI 02816

Jotun Marine Coatings  
840 Key Highway, Baltimore, MD 21230

Kaiser Chemicals, Div. Kaiser Aluminum  
& Chemical Corporation  
300 Lakeside Drive, RM KB 1128, Oakland,  
CA 94542

Kenco Div. Southern Coatings, Inc.  
P.O. Box 160, Sumter, SC 29150

Magnus Maritec International, Inc.  
150 Roosevelt Place, Palisades Park, NJ 07405

METCO, Inc.  
1101 Prospect Avenue, Westbury, NY 11590

Mobil Chemical Co.  
150 JFK Parkway, Short Hills, NJ 07078

Nalco Chemical Company  
2901 Butterfield Road, Oakbrook, IL

Norton Corrosion Limited  
22327 89th Ave., SE, Woodinville, WA 98072

Occidental Chemical  
P.O. Box 728, Niagara Falls, NY 14302

Osmose-Marine Division  
P.O. Drawer O, Griffing, GA 30224

Palmer Products, Inc.  
Worcester, PA 19490

Pauli & Griffin Co., Inc.  
137 Utah Ave., South San Francisco, CA 94080

Pennington Mfg.  
5901 Edison Road, Oxnard, CA

Products Research & Chemical Corporation  
5430 San Fernando Road, P.O. Box 1800,  
Glendale, CA 91208

Reynolds Metals Company  
P.O. Box 27003, Richmond, VA 23261

Sanchem Inc.  
1600 S. Canal St., Chicago, IL 60609

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

Schmidt Manufacturing Inc.  
P.O. Box 45857, Houston, TX 77254

Sigma Coatings, Inc.  
P.O. Box 826, Harvey, LA 70059

Slime Marine Inc.  
P.O. Box 2726, Houston, TX 77001

Stainless Steel Coatings  
Box H 265, Littleton, MA

Timmons & Charles, Inc.  
991 East Linden Ave., P.O. Box 507,  
Linden, NJ 07036

Wheelabrator-Frye Inc.  
400 S. Byrkit Ave., Mishawaka, IN 46544

Wilson, Walton International  
P.O. Box M-890, 66 Hodson St.,  
Hoboken, NJ 07030

Woolsey Marine  
1250 Broadway, New York, NY 10001

## DECK MACHINERY — CARGO HANDLING EQUIPMENT — CRANES

Write 47 on Reader Service Card

Alpha Technical Services Inc. (ATS),  
P.O. Box 446, Hamilton, OH 45012

American Hoist & Derrick Co. (Amhoist)  
63 South Robert St., St. Paul, MN 55107

Appleton Marine, Div. of Appleton Machine Co.  
P.O. Box 2339, Appleton, WI 54913

Atco Marine Corporation  
603 Dean St., Brooklyn, NY 11238

L.S. Baier & Assoc.  
7527 NE 33rd Dr., Portland, OR 97211

Baker Marine Corporation  
P.O. Box 190, Ingleside, Texas 78362

Beebe International, Inc.  
2724 6th Ave. South, Seattle, WA 98134

Bertsch And Company, Inc.  
2 East Church Street, Cambridge City, IN 47327-  
1297

J.W. Burruss, Inc.  
P.O. Box 12496, Norfolk, VA

CMH-Hele-Shaw, Inc.  
201 Harrison St., Hoboken, NJ 07030

Campbell Chain Division, McGraw-Edison Co.  
3990 E. Market St., York, PA 17402

Conmaco, Inc.  
820 Kansas Avenue, Kansas City, KS 66119

Cunningham Marine Hydraulics Co., Inc.  
201 Harrison St., Hoboken, NJ 07030

Cyclonaire Corporation  
P.O. Box 548, Henderson, NE 68137

Dynamic Air Inc.  
1125 Wolters Blvd., St. Paul, MN 55110

Emco-Wheaton Ltd.  
136 The East Mall, Toronto, Ontario, Canada  
M8Z 5M2

FMC Corporation  
2800 Lakeside Drive, Bannockburn, IL 60015

Federal Equipment Co.  
728 Mehring Way, Cincinnati, OH 45203

Gearmatic Co.  
7400 132nd St., Surrey, BC, Canada V3T, 4X4

Harnischfeger Corp.  
P.O. Box 554, Milwaukee, WI 53201

John T. Hepburn, Limited  
914 Dupont St., Toronto, Canada, M6H 1Z2

Hiab Cranes & Loaders, Inc.  
Rd. #6, Box 34-B, York, PA 17404

A.C. Hoyle Company  
103 East "H" Street, P.O. Box 580,  
Iron Mountain, MI 49801

Hyde Products, Inc.  
810 Sharon Dr., Cleveland, OH 44145

Jered Brown Brothers, Inc.  
1300 South Coolidge Road, Birmingham, MI 48008

Almon A. Johnson, Inc.  
425 Morris Ave., Elizabeth NJ 07207

Kone Corporation  
1904 West 16th Avenue, Vancouver, B.C., Canada

Lake Shore, Inc.  
P.O. Box 809, Iron Mountain, MI 49801

Linden-Alimak, Inc.  
1100 Boston Avenue, Bridgeport, CT 06610

Line Fast Corporation  
805 Grundy Avenue, Holbrook, NY 11741

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

MacGregor-Comarain, Inc.  
135 Dermody Street, Cranford, NJ

Marine Travelift, Inc.  
P.O. Box 66, Sturgeon Bay, WI 54235

Markey Machinery Co., Inc.  
P.O. Box 24788, Seattle, WA 98124-0788

Marotta Scientific Controls, Inc.  
1500 Boonton Avenue, Boonton, NJ

Nautilus Crane & Equipment Corporation  
P.O. Drawer 1287, Metairie, LA 70004

Navire Cargo Gear  
570 Rahway Avenue, Woodbridge, NJ 07095

New England Trawler Equipment Co.  
291 Eastern Avenue, Chelsea, MA 02150

Opdykes Sales  
793 Bethlehem Pike, P.O. Box 252,  
Colmar, PA 18915

Paceco Inc.  
P.O. Box 3400, Gulfport, MS 39503-1400

W.W. Patterson Co.  
3 Riversea Road, Pittsburgh, PA 15233

Paul-Munroe Hydraulics, Inc.  
1701 West Sequoia Avenue, Orange, CA 92668

Provincial Crane, AMCA International  
P.O. Box 1013, Niagara Falls, Ontario, Canada

Reel-O-Matic Systems, Inc.  
P.O. Box 69, Wrightsville, PA 17368

Republic Equipment & Machinery Co., Inc.  
108-18 Queens Blvd., Forest Hills, NY 11375

Ro Corporation  
550 East Highway 56, P.O. Box 2110, Olathe, KS  
66061

The Schat Davit Corporation  
226 West Park Place, Newark, DE 19711

Schiller International Corp.  
2101 Exe. Drive, Box 40, Hampton, VA 23666

Schoellhorn-Albrecht Div. of St. Louis Ship  
3460 S. Broadway, St. Louis, MO 63118

Scholtz-EFS Corporation  
6926 Little River Turnpike, Annandale, VA 22003

Scott Huber  
P.O. Box 10263, Charleston, SC 29411

Sea-Mac Marine  
10669 Richmond, Houston, TX 77042

Ship Supply Corporation  
87 Hamilton Avenue, Brooklyn, NY 11231

Skagit Division, Continental Emco Co.  
P.O. Box 151, 500 Metcalf St., Sedro-Woolley, WA  
98284

SMATCO, Inc.  
P.O. Box 4036, Houma, LA 70361

Smith-Berger Manufacturing Corporation  
3236 16th Avenue SW, Seattle, WA 98134

Stroudsburg Engine Works, Inc.  
P.O. Box 350, Stroudsburg, PA 18360

Superior-Lidgerwood-Mundy Corp.  
1101 John Ave., P.O. Box 39, Superior, WI 54880

Tacoma Boatbuilding Co.  
1840 Marine View Drive, Tacoma, WA 98422

Timberland Equipment Ltd.  
P.O. Box 490, Woodstock, Ontario, Canada N4S 7Z2

Tracor Marine, Inc.  
P.O. Box 13107, Ft. Lauderdale, FL 33316

TSE International  
Rte. 4 Box 124F, Shreveport, LA 71107

Tulsa Power Products, Inc.  
11130 East 56th Street, South Tulsa, OK 74145

Howard Turner Mfg. Co.  
2545 Palm Drive, Long Beach, CA 90806

Washington Aluminum Co., Inc.  
Knecht Avenue, Baltimore, MD 21229

Xtek Inc.  
211 Township Avenue, Cincinnati, OH 45238

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

## ELECTRICAL

Write 49 on Reader Service Card

AMP Special Industries  
P.O. Box 1776, Paoli, PA 19301

Anixter Bros., Inc.  
4711 Golf Road, Skokie, IL 60076

Bogue Electric Mfg. Co.  
100 Pennsylvania Ave., Paterson, NJ 07631

Brand-Rex Company, Electronic and Industrial Cable  
Division  
1600 West Main St., P.O. Box 498, Willimantic, CT  
06226

Brown & Ross of New Jersey, Inc.  
40 Columbia Avenue, Jersey City, NJ 07307

Calfonex  
85 Industrial Ave., Little Ferry, NJ 07643

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

Duraline, Div. of J.B. Nottingham & Co., Inc.  
75 Hoffman Lane, Central Islip, NY 11722

L.F. Gaubert & Co., Inc.  
P.O. Box 50500, New Orleans, LA 70150

The Guest Corporation  
130 Shield Street, West Hartford, CT 06110

Joy Mfg. Co.  
Rt. 4, Box 156, LaGrange, NC 28551

Naporano/Railroad Division  
Foot of Hawkins St., Newark, NJ 07105

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

Ship Supply Corporation  
87 Hamilton Avenue, Brooklyn, NY 11231

Sigmaform Corporation  
P.O. Box 515, Richboro, PA 18954

Trinetics, Inc.  
55807 Currant Rd., Mishawaka, IN 46545

Universal Wire & Cable Co.  
2929 N. Paulina, Chicago, IL 60657

Ward Leonard Electric Co., Inc.  
31 South St., Mount Vernon, NY 10550

Edwin L. Wiegand Division Emerson Electric Co.  
4 Allegheny Center, Pittsburgh, PA 15212

## FANS — VENTILATION

Write 50 on Reader Service Card

Camar Corporation  
186 Prescott St., Worcester, MA 01613  
Cargocaire Marine Systems  
79 Monroe St., Amesbury MA 01913  
The Flexaust Company  
11 Chestnut St., Amesbury, MA 01913  
The Guest Corporation  
130 Shield St., West Hartford, CT 06110  
Hartzell Fan  
P.O. Box 919, Piqua, OH 45356  
Joy Manufacturing Co.  
338 South Broadway, New Philadelphia, OH 44663

## FIRE PROTECTION — ALARMS

Write 51 on Reader Service Card

Alexander Industries, Inc.  
P.O. Box 51886, New Orleans, LA 70151  
Autronica Marine, USA Inc.  
234 Industrial Parkway, Northvale, NJ 07647  
Chemetron Fires Systems  
Route 50 & Governors Highway, Monee, IL 60449  
Houston Fire & Safety Equipment Co.  
P.O. Box 12639, Houston, TX 77217  
Rockwood Systems Corporation  
8350 N. Central Expressway Suite 1800, Dallas, TX 75206  
Wormald Fire Systems  
1 Stanton St., Marinette, WI 54143

## FLOTATION — FOAM

Write 52 on Reader Service Card

J.W. Automarine Corp.  
One North Broadway, Suite 620, White Plains, NY 10601  
CPR Division of the Upjohn Company  
555 Alaska Avenue, Torrance, CA 90503

## GALLEY EQUIPMENT

Write 53 on Reader Service Card

Gaylord Industries, Inc.  
P.O. Box 558, 9600 SW Seely Ave., Wilsonville, OR 97070  
Gerber International Supply Company, Division of Gerber's Restaurant Supply Co.  
2222 Pierce Ave., Houston, TX 77003  
Kiefer Corporation  
W. 227 N. 546 Westmound Drive, Waukesha, WI 53186

## INERT GAS

Write 54 on Reader Service Card

AIRFILCO  
5555 North Channel Avenue, Swan Island, Building 43, Portland, OR 97217  
Camar Corporation  
186 Prescott St., Worcester, MA 01613  
Foster Wheeler Boiler Corp.  
110 S. Orange Ave., Livingston, NJ 07039  
Gas Atmospheres  
336 South Spring Street, Port Washington, WI 53074  
Smit Nymegen Corporation  
1511 K Street, N.W., Washington, DC 20005  
Tanker Systems Service Corp.  
4801 Woodway, 300E, Houston, TX

## LADDERS

Write 55 on Reader Service Card

AFC, Inc.  
Highway 52 South, Chatfield, MN 55923  
Alexander Marine Associates, Inc.  
P.O. Box 1048, Port Washington, NY 11050  
Duo-Safety Ladder Corp.  
P.O. Box 497, Oshkosh, WI 54902  
Lapeyre Stair, Inc.  
220 Laitram Lane, Harahan, LA 701  
H.K. Metalcraft Mfg. Corp.  
35 Industrial Rd., P.O. Box 260, Lodi, NJ 07644  
Rampmaster Incorporated  
1226 N.W. 23rd Avenue, Fort Lauderdale, FL 33311  
Sidewinder International, Ltd.  
P.O. Drawer 5007, Wilmington, NC 28403  
Washington Aluminum Co., Inc.  
Kecht Avenue, Baltimore, MD 21229

## LIGHTING

Write 56 on Reader Service Card

Aqua-Signal/Browning Signal, Inc.  
33W480 Fabyan Parkway, Suite 105, West Chicago, IL 60185  
Birns Oceanographics, Inc.  
P.O. Box 24160, Los Angeles, CA 90024-160  
The Carlisle & Finch Co.  
4562 W. Mitchell Avenue, Cincinnati, OH 45232-1798  
The Guest Corporation  
130 Shield St., West Hartford, CT 06110  
Murlin Mfg. Corp.  
P.O. Box 757, Quakertown, PA 18951

Port Electric Supply Corp.  
157 Perry Street, New York, NY 10014  
Super-Marine Div. of Phoenix Product Co.  
4715 North 27th Street, Milwaukee, WI 53209

## LUBE OILS—FUELS—ADDITIVES—SYSTEMS

Write 57 on Reader Service Card

Avicon Corporation  
7750 E. Redfield Rd., Suite 106, Scottsdale, AZ 85260  
Bull & Roberts, Inc.  
785 Central Avenue, Murray Hill, NJ 07974  
Burmah-Castrol, Inc.  
30 Executive Ave., Edison, NJ 08817  
Drew Chemical Corporation  
1 Drew Chemical Plaza, Boonton, NJ  
Eastern Seaboard Petroleum Co.  
P.O. Box 3233, Jacksonville, FL  
Exxon International Company  
1251 Avenue of the Americas, New York, NY 10020  
Ferrous Corp.  
910 108th NE, P.O. Box 1764, Bellevue, WA 98009  
Fire-Brite, Hoffert Mfg. Company, Inc.  
1700 East Church Street, Jacksonville, FL  
Gulf Oil Corp.  
P.O. Box 1563, Houston, TX 77251  
International Marine Sales Inc.  
489 Fifth Avenue, New York, NY 10017  
Keene Corp.  
1571 Forrest Avenue, LaGrange, GA 30240  
Magnus Maritec International Inc.  
150 Roosevelt Place, Palisades Park, NJ 07405  
A. Margolis & Sons Corp.  
1504 Atlantic Ave., Brooklyn, NY 11216  
Mobil Oil Co.  
3225 Gallows Rd., Fairfax, VA 22031  
Parker Hannifin  
16810 Fulton City Rd. #2, Metamora, OH 43540  
Seaworthy Engine Systems Inc.  
36 Main St., Essex, CT 06426  
Shell Oil Company  
1 Shell Plaza, Houston, TX 77002  
Synthetic Engineered Lubricants Co.  
3316 Stuart Drive, Ft. Worth, Texas 76110  
Texaco Inc.  
2000 Westchester Ave., White Plains, NY 10650  
XRG International, Inc.  
4125 SW Martin Highway, Stuart, FL 33494

## MOORING SYSTEMS — ANCHORS CHAINS — FENDERING

Write 58 on Reader Service Card

Alexander Marine Associates, Inc.  
P.O. Box 1048, Port Washington, NY 11050  
Aquatic Marine Systems, Inc.  
P.O. Box 326, Williamsville, NY 14221  
Baldt Inc.  
P.O. Box 350, Chester, PA 19016  
Campbell Chain Division, McGraw Edison Co.  
3990 E. Market St., York, PA 17402  
Danforth, Div. of The Eastern Co.  
500 Riverside Industrial Pkwy., Portland, ME 04103  
Dreyfus Supply & Machinery Corp.  
2121 Poland Ave., New Orleans, LA 70177-3116  
Hamanaka International, Inc.  
1980 Post Oak Blvd., Suite 1000, Houston, TX 77056  
IMODCO  
10960 Wilshire Blvd., Suite 1100, Los Angeles, CA 90024  
Intertrade Industries, Ltd.  
15301 Transistor Lane, Huntington Beach, CA 92649  
Lord Corporation  
1635 West 12th St., P.O. Box 10039, Erie, PA 16514-0039  
Marine Chemtronics Corp.  
333 N. Belt East, Suite 1150, Houston, TX 77060  
H.K. Metalcraft Manufacturing Corp.  
35 Industrial Road, Lodi, NJ 07644  
New England Trawler Equipment Co.  
291 Eastern Ave., Chelsea, MA 02150  
ORECO III Inc.  
P.O. Box 51303, Lafayette, LA 70505  
Schuyler's Bumpers, Inc.  
P.O. Box 326, Woodenville, WA 98072  
Seaward International, Inc.  
6269 Leesburg Pike, Falls Church, VA 22044

## MARINE EQUIPMENT

General-Machines, Tools, Parts

Write 59 on Reader Service Card

Boston Metals Co.  
313 E. Baltimore St., Baltimore, MD 21202  
Locators International  
P.O. Box 4082, Bellingham, WA 98227  
Dynalube Of North America  
1438 North Gower St., Los Angeles, CA 90028  
Hilman Rollers  
2604 Atlantic Ave., Wall (Belmar), NJ 07719

Houma Machine & Marine Supply, Inc.  
1219-27 E. Main St., Houma, LA 70360  
Levin Metals Corporation  
1310 Canal Blvd., P.O. Box 398 Point Station, Richmond, CA 94807  
Mapeco Products, Inc.  
20 Vesey Street, New York, NY 10007  
Nicolai Joffe Corporation  
9171 Wilshire Blvd., #428, P.O. Box 5362, Beverly Hills, CA 90210  
Republic-Lagun Machine Tool Co.  
P.O. Box 4586, 1000 E. Carson St., Carson, CA 90749  
Ship Supply Corporation  
87 Hamilton Avenue, Brooklyn, NY 11231  
Waterman Supply Company, Inc.  
P.O. Box 596, Wilmington, CA 90748  
Zidell Explorations, Inc.  
3121 S.W. Moody Ave., Portland, OR 97201

## NAVIGATION & COMMUNICATIONS EQUIPMENT

Write 60 on Reader Service Card

ARS Electronics  
7808 Gloria Avenue, Van Nuys, CA 91409  
Alden Electronic & Impulse Recording Equipment Co.  
Washington St., Westboro, MA 01581  
Alexander Marine Associates, Inc.  
P.O. Box 1048, Port Washington, NY 11050  
Ametek, Straza Division  
790 Greenfield Drive, El Cajon, CA 92022  
Anschuetz of America  
187 East Union Ave., East Rutherford, NJ 07073  
Aquadynamics, Inc.  
168 Rockland Avenue, P.O. Box 1049, Woonsocket, RI 02895  
Aqua Marine Engineering Company  
P.O. Box 83495, San Diego, CA 92138  
Asea, Inc.  
4 New King Street, White Plains, NY 10604  
Atkinson Dynamics, Div. of Guy F. Atkinson  
10 West Orange Avenue, So. San Francisco, CA  
Automatic Power Inc.  
P.O. Box 18738, Houston, TX 77023  
Brookes & Gatehouse Inc.  
154 East Boston Post Rd., Mamaroneck, NY 10543  
Calvert Electronics, Inc.  
1 Branca Road, E. Rutherford, NJ 07073  
Communication Associates, Inc.  
200 McKay Road, Huntington Station, NY 11746  
Coursemaster America Corp.  
432 E. 91st St., New York, NY 10028  
Danforth, Div. of The Eastern Co.  
500 Riverside Industrial Pkwy., Portland, ME 04103  
Digicourse, Inc.  
5200 Toler St., Harahan, LA 701  
EDO Corp.  
Government Systems Div., 14-04 111th St., College Point, NY 11356  
EEV Inc.  
7 Westchester Plaza, Elmsford, NY 10523  
Electronic Services, Inc.  
P.O. Box 9, Westwego, LA 70094  
Epsco, Inc./Marine Division  
411 Providence Highway, Westwood, MA 02090  
Fleet Marine  
1820 N.E. 146 Street, N. Miami, FL  
Furuno USA Inc.  
271 Harbor Way, S. San Francisco, CA 94080  
Griffith Marine Navigators, Inc.  
134 North Avenue, New Rochelle, NY  
Harris Corp., RF Communications Div.  
1680 University Avenue, Rochester, NY 14610  
Henschel Corporation  
14 Cedar St., Amesbury, MA 01913  
ITT Surprenant Division  
172 Sterling St., Clinton, MA 01510  
Intech Incorporated  
282 Brokaw Road, Santa Clara, CA 95050  
Ray Jefferson Company  
Main & Cotton St., Philadelphia, PA 19127  
Krupp Atlas-Elektronik  
241 Erie St., Jersey City, NJ 07302  
McKay Dymek Div. of Stoner Communications, Inc.  
9119 Milliken Ave., Rancho Cucamonga, CA 01730  
Magnavox Advanced Products and Systems Company  
2829 Maricopa Street, Torrance, CA 90503  
Maritel, Inc.  
8230-R Telegraph Rd., Odenton, MD 21113  
Modar Electronics/Motorola Marine Communications  
1301 E. Algonquin Rd. (SH-4), Schaumburg, IL 60196  
Morrow Electronics, Inc.  
4740 Ridge Drive, Salem, OR 97303  
N.C.S. (Navigation Communications Systems, Inc.)  
20100 Plummer Street, Chatsworth, CA  
Nav-com Incorporated  
9 Brandywine Drive, P.O. Box 650, Deer Park, NY 11729

Norcontrol  
135 Fort Lee Road, Leonia, NJ 07605

Phelps Dodge Communications Inc.  
Rt. 79, Marlboro, NJ 07746

Racal-Decca Marine Inc.  
4200 23rd Ave. West, Seattle, WA 98199

Radio Holland USA, Inc.  
One Allen Ctr., Suite 1000, Houston, TX 77002

Raytheon Marine Company  
676 Island Pond Road, Manchester, NH 03103

Raytheon Ocean Systems Company  
10 Risho Ave., Westminster Park, East Providence, RI 02914

Raytheon Company, Submarine Signal Division  
P.O. Box 360, 1847 W. Main Rd., Portsmouth, RI 02871

Regency Electronics, Inc.  
7707 Records St., Indianapolis, IN 46226

Robertson, Division of Kongsberg N.A.  
135 Ft. Lee Rd., Leonia, NJ 07605

Rockwell International, Autonetics Marine Systems Division  
3370 Miraloma Avenue, Anaheim, CA 92803

SGC, Inc.  
13737 S.E. 26th St., Bellevue, WA 98005

Scientific-Atlanta, Inc.  
3845 Pleasantdale Road, Atlanta, GA 30340

Servo Corporation of America  
111 New South Road, Hicksville, NY 11746

Simrad, Inc.  
2215 N.W. Market Street, Seattle, WA

Southern Marine Research, Inc.  
1401 N.W. 89th Court, Miami, FL 33172

Sperry  
Great Neck, NY 11020

Standard Communications Corp.  
P.O. Box 92151, Los Angeles, CA 90009

Teledyne Hastings-Raydist  
P.O. Box 1275, Hampton, VA 23661

Trimble Navigation  
1077 Independence Ave., Mountain View, CA 90274

**OIL/WATER SEPARATORS  
WATER TREATMENT — EVAPORATORS**

Write 61 on Reader Service Card

Alfa-Laval, Inc.  
2115 Linwood Avenue, Fort Lee, NJ 07024

American-Standard Heat Transfer Division  
P.O. Box 1102, Buffalo, NY 14240

Aqua-Chem, Inc.  
P.O. Box 421, Milwaukee, WI

Aqua Global, Inc.  
50-60 Inip Drive, Inwood, NY 11696

Bailey Refrigeration Co., Inc.  
74 Sullivan St., Brooklyn, NY 11231

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

Butterworth Systems Inc.  
224 Park Avenue, Box 352, Florham Park, NJ 07932

National Fluid Separators, Inc.,  
1239 Hanley Industrial Court, St. Louis, MO 63144

Drew Chemical Corp.  
One Drew Plaza, Boonton, NJ 07005

Eagle Equipment Co.  
103 N. 11th Ave., St. Charles, IL 60174

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

Facet Enterprises, Inc.  
P.O. Box 50096, Tulsa, OK 74150

Fram Industrial  
P.O. Box 33210, Tulsa, OK 74135

McTighe Industries, Inc.  
1615 Ninth Avenue, Suite 1 South, Bohemia, NY

Magnus Maritec International, Inc.  
150 Roosevelt Place, Palisades Park, NJ 07405

Manning & Lewis Engineering Co.  
675 Rahway Ave., Union, NJ 07083

Marine Engineering, Inc.  
P.O. Box 30590, New Orleans, LA 70190

Marland Environmental Systems Inc.  
227 N. Main Street, P.O. Box 9, Walworth, WI 53184

Microphor Inc.  
P.O. Box 490, Willits, CA 95490

Nelson Division, Nelson Industries, Inc.  
P.O. Box 428, Stoughton, WI 53589

Red Fox Industries, Inc.  
P.O. Drawer 640, New Iberia, LA 70560

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

Univox California Inc.  
6551 Loisdale Court, Springfield, VA 22150

**PIPE — TUBING — FITTINGS**

Write 62 on Reader Service Card

Advanced Petroleum Services, Inc.  
P.O. Box 53096, Lafayette, LA 70505

Aeroquip Corp.  
300 S. East Ave., Jackson, MI 49203

Anchoring International, Inc.  
1401 Brittmoore Rd., Houston, TX 77043

Band-It Division, Houdaille Industries, Inc.  
P.O. Box 16307, Denver, CO 80216

Custom Alloy Corp.  
Route 513, Califon, NJ 07830

Gripper, Inc.  
1107 Aldine Mail Route, Houston, TX 77039

Hayward Marine Products  
900 Fairmont Ave., Elizabeth, NJ 07207

Hydro-Craft Inc.  
1821 Rochester Industrial Dr., Rochester, MI 48063

Hyspan Precision Products, Inc.  
1844 Imperial Ave., San Diego, CA 92102

Knights Piping, Inc.  
P.O. Box 851, 5039 Industrial Rd., Pascagoula, MS 39567

Kubota America Corp.  
405 Lexington Ave., New York, NY 10174

Murdock Machine & Engineering Co. of Texas  
5100 Airport Fwy. W., P.O. Box 2278, Irving, TX 75601

Nelson Stud Welding Division, TRW Assemblies & Fasteners Group  
E. 28th & Toledo Ave., Lorain, OH 44055

Parker Hannifin Corp., Fluid Connectors Group,  
17325 Euclid Ave., Cleveland, OH 44112

Pioneer Valve & Fitting Co., Inc.  
93 Siegel Street, Brooklyn, NY 11206

Stauff Corporation  
21-23 Industrial Park, Waldwick, NJ 07463

Taylor Forge Stainless, Div. Gulf & Western Mfg.  
P.O. Box 610, Sommerville, NJ 08876

Tioga Pipe Supply Co.  
2450 Wheatshaf Lane, P.O. Box 5997, Philadelphia, PA 19137

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Alco Power Inc.  
100 Orchard St., Auburn, NY 13021

Alnor Instrument Co.  
7301 N. Caldwell Ave., Niles, IL 60648

American M.A.N.  
50 Broadway, New York, NY 10004

American Standard/WABCO  
1953 Mercer Rd., Lexington, KY 40574

American Vulcan Corp.  
2525 Dundee Rd., Winter Haven, FL 33880

Armco Stainless Steel Div.  
P.O. Box 1697, Baltimore, MD 21203

Atco Marine Corp.  
603 Dean St., Brooklyn, NY 11238

Avco Lycoming Stratford Division  
550 So. Main St., Stratford, CT 06497

BFC Marine Services, Inc.  
25 Fifth St., Brooklyn, NY 11231

B & W Diesel, Inc.  
50 Broadway, New York, NY 10004

Bird-Johnson Company  
110 Norfolk St., Walpole, MA 02081

G.R. Bowler Inc.  
23 Williams St., Wharton, NJ 07885

Burford Equipment Co.  
P.O. Box 1591, Montgomery, AL 36192

Boyce Machinery Corporation  
P.O. Drawer AJ, Reserve, LA 70084

CR Industries  
900 N. State St., Elgin, IL 60120

Camar Corporation  
186 Prescott St., Worcester, MA 01613

CamLock Flange Sales Corp.  
50-60 Inip Drive, Inwood, NY 11696

Capitol Gears, Inc.  
349 North Hamline Ave., St. Paul, MN 55104

Carpenter Technology Corp.  
101 W. Bern St., Reading, PA 19601

Caterpillar Engine Division  
100 N.E. Adams, Peoria, IL 61629

Colt Industries - Fairbanks Morse  
9219 Katy Freeway, Suite 106, Houston, TX 77024

Combustion Engineering, Inc., C-E Marine Power Systems  
1000 Prospect Hill Road, P.O. Box 500, Windsor, CT 06095

Combustion Engineering Superheater Ltd.  
99 Bank Street, Ottawa, Ontario, Canada K1P 6C5

Commodities Recovery Corp.  
150 Fifth Avenue, New York, NY 10011

Alfred Conhagen Inc.  
110 Sylvania Place, South Plainfield, NJ 07080

Cooper Bearing Company  
5795 Thurston Avenue, Virginia Beach, VA 23455

Crane Packing  
6400 Oakton, Morton Grove, IL

Cummins Engine Company, Inc.  
Box Number 3005, Columbus, IN 47201

Detroit Diesel Allison Div. of General Motors Corp.  
13400 West Outer Drive, Detroit, MI 48239

Deutz Corporation  
7809 Airline Hwy., Suite 207F, Metairie, LA

Diesel Parts Corporation  
1133 Zerega Avenue, Bronx, NY 10462

Diesel Engine & Fabricating Co., Inc.  
223 McCarty, Houston, TX

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

Donaldson Company, Inc.  
P.O. Box 1299, Minneapolis, MN 55440

Electro-Motive Div., General Motors Corp.  
9301 W. 55 Street, LaGrange, IL

Elliott Company  
P.O. Box 239, Springfield, OH 45505

Essex Machine Works Inc.  
50 West Ave., Essex, CT 06426

Fairbanks Morse Engine Div., Colt Industries  
701 Lawton Avenue, Beloit, WI 53511

Farrel Company  
Emhart Machinery Group, Ansonia, CT 06401

R.W. Fernstrum & Company  
1716 - 11th Avenue, P.O. Box 87, Menominee, MI 49858

GMT of American Corp.  
P.O. Box 1220, Stamford, CT 06904

Garlock - Mechanical Packing Division, International Marine Sales  
1666 Division Street, Palmyra, NY 14522

Gearmatic Co.  
7400 132nd St., Surrey, B.C. Canada V3T 4X4

General Electric Co., Diesel Power Products  
2901 East Lake Rd., Erie, PA 16531

General Electric Company, Medium Steam Turbine Dept.  
1100 Western Avenue, Lynn, MA 01910

General Electric/Marine & Industrial Engines and Service Division  
Neumann Way, Cincinnati, OH 45215

General Thermodynamics Corp.  
210 So. Meadow Rd., P.O. Box 1105, Plymouth, MA 02360

Goodyear Aerospace Corporation  
Glades Road, Berea, KY 40403

Harbormaster Division of Mathewson Corp.  
2 Hancock St., Quincy, MA 02171

Haynes Corporation  
3725 Commerce Street, P.O. Box 179, Jackson, MI

The Hunt Company  
P.O. Box 35685, Houston, TX 77035

Inland Marine Industries  
1818-30 Harrison Street, San Francisco, CA 94103

Inland Water Propulsion Systems  
P.O. Box 1460, 1400 580 Building, Cincinnati, OH

Intertrade Industries, Ltd.  
15301 Transistor Lane, Huntington Beach, CA 92649

Jacuzzi Bros. Division  
P.O. Box 3533, Little Rock, AR 72203

Jim's Pump Repair Inc.  
48-55 36th Street, Long Island City, NY 11101

The Johnson Rubber Company, Duramax Marine Division  
16025 Johnson Street, Middlefield, OH 44062

Johnson & Towers, Inc.  
P.O. Box 38, Mt. Laurel, NJ 08054

Kelly Tractor Co. - Pantropic Div.  
8255 N.W. 58th St., Miami, FL 33166

Kennedy Engine Co., Inc.  
P.O. Box 117, Mobile, AL 36601

Koppers Co. Power Transmission Division  
P.O. Box 1696, Baltimore, MD 21203

Lord Corporation  
1635 West 12th St., P.O. Box 10039, Erie, PA 16514

Louisiana Dock Company  
P.O. Box 610, Jeffersonville, IN 47130

Lufkin Industries, Inc.  
P.O. Box 849, Lufkin, TX 75901

MTU of North America, Inc.  
1 East Putnam Avenue, Greenwich, CT 06830

Merriman  
100 Industrial Park Rd., Hingham, MA 02043

Michigan Wheel  
1501 Buchanan Ave. SW, Grand Rapids, MI 49507

Robert W. Mitchell  
P.O. Box 1637, Houston, TX 77001

Lucian Q. Moffitt, Inc.  
P.O. Box 1415, Akron, OH 44309

Motive Power Corp. — Z-F  
P.O. Box 365, Mineola, NY 11501

MWM/Murphy Diesel Co.  
5317 W. Burnham St., Milwaukee, WI 53219

MWM Murphy/Large Bore Div.  
1809 Carol Sue Ave., Gretna, LA 70053

Murray Tube Works Inc.  
P.O. Box 2065, Union, NJ 07083

Naporano/Railroad Division  
Foot of Hawkins St., Newark, NJ 07105

National Marine Service Inc.  
Foot of Hawthorne St., P.O. Box 38, Hartford, IL 62048

Nissho Iwai American Corporation  
1211 Avenue of the Americas, New York, NY 10036

Omnithruster Inc.  
9515 Sorensen Avenue, Santa Fe Springs, CA 90670

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P.O. Box 30587, New Orleans, LA

P & S Diesel Service, Inc.  
17 Louisiana Avenue, P.O. Box 74, Westwego, LA 70094

Paragon Power Inc.  
7455 Tyler Blvd., Mentor, OH 44060

Parts Maintenance Inc. (PMI)  
10612 Cherryhill Avenue, Baton Rouge, LA 70816

Patterson Machine  
12 Van Dyke St., Brooklyn, NY 11231

H.O. Penn Machinery Co.  
1-684 Route 22, Armonk, NY 10504

Propulsion Systems, Inc.  
P.O. Box 1285, Kent, WA 98040

Ransome Engine Power  
777 American Dr., Wes-Port Industrial Park, Bensalem, PA 19020

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

John Robinson Co., Inc.  
3930 Kirby Drive, Suite 265, Houston, TX 77098

Rozier Machinery Company  
1219 N. Hwy. 301, P.O. Box 1872, Tampa, FL 33601

Schoonmaker Service Parts Co., Inc.  
Foot of Spring St., P.O. Box 757, Sausalito, CA 94966

Ship Supply Corporation  
87 Hamilton Avenue, Brooklyn, NY 11231

Skinner Engine Company  
337 West 12th Street, Erie, PA

Stewart & Stevenson Services Inc.  
8631 East Freeway, Houston, TX 77029

Thomson Gordon Ltd.  
3225 Mainway Drive, Burlington, Ontario, Canada L7M 1A6

The Torrington Company  
59 Field Street, Torrington, CT 06790

Transamerica Delaval, Inc.  
P.O. Box 6550, Lawrenceville, LA 08648

Turbine Specialties, Inc.  
Box 207 West State Street Road, Salina, KS 67401

Twiflex Corporation  
703-C S. Main Street, Horseheads, NY 14845

Van der Horst Corporation of America  
314 Penn Ave., Olean, NY 14760

Voith Transmissions, Inc.  
7 Pearl Court, Allendale, NJ 07401

Volvo Penta of America  
P.O. Box 927, Rockleigh, NJ 07647

Wartsila Power, Inc.  
5132 Tatavella Road, Marrero, LA 70072

Waukesha Bearings Corp.  
P.O. Box 798, Waukesha, WI 53186

Waukesha Engine Division  
1000 W. St. Paul Avenue, Waukesha, WI

Western Engine Co.  
750 Route 53, Itasca, IL 601433

Western Gear Corporation  
2600 East Imperial Highway, Lynwood, CA 90262

Westinghouse Electric Corporation  
401 East Hendy Ave., Sunnyvale, CA 94088

Wichmann Diesel, Inc.  
2701 Delaware Avenue, Kenner, LA 70062

## PUMPS AND COMPRESSORS

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Atlas Copco Industrial Compressors  
104 Lower Westfield Rd., Holyoke, MA 01040

Alfred Conhagen Inc.  
110 Sylvania Place, South Plainfield, NJ 07080

Danfoss, Inc.  
16 McKee Drive, Mahwah, NJ 07430

FMC Coffin Turbo Pump  
326 S. Dean Street, Englewood, NJ 07631

Goulds Pumps, Inc.  
Fall Street, Seneca Falls, NY 13148

Hayward Tyler Inc.  
25 Harbor Ave., Norwalk, CT 06850

Homelite/Textron  
P.O. Box 7047, Charlotte, NC

Hyde Products, Inc.  
810 Sharon Dr., Cleveland, OH 44145

ITT Jabsco Products  
1485 Dale Way, Costa Mesa, CA 92626

ITT Marlow Pumps  
P.O. Box 200, Midland Park, NJ 07432

MP Pumps Div. Tecumseh Products, Co.  
515 Lycaste, Detroit, MI 48214

Megator Corporation  
562 Alpha Dr., Pittsburgh, PA 15238

Multiquip Inc.  
19600 Wilmington Avenue, Carson, CA 90746

NLB Corporation  
29830 Beck Road, Wixom, MI

The Nash Engineering Company  
Wilson Ave., Norwalk, CT 06856

W.H. Nichols Company  
48 Woerd Avenue, Inaltham, MA 02254

Peabody Barnes, Inc.  
651 N. Main St., Mansfield, OH 44902

The Rexroth Corporation  
P.O. Box 2407, Bethlehem, PA 18081

S & R Pump Company  
7545 Breen, Houston, TX

Superior-Lidgerwood-Mundy Corp.  
1101 John Ave., P.O. Box 39, Superior, WI 54880

Transamerica Delaval - IMO Pump Div.  
P.O. Box 447, Monroe, NC 28110

Warren Pumps Division, Houdaille Industries, Inc.  
Bridges Avenue, Warren, MA 01803

Wilden Pump and Engineering Co.  
P.O. Box 845, Colton, CA 92324

Worthington Division, McGraw-Edison Co.  
P.O. Box 69, Buffalo, NY 14240

## SAFETY EQUIPMENT

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ACR Electronics, Inc.  
3901 N. 29th Ave., Hollywood, FL 33022

Datrex  
3795 N.W. 25th St., Miami, FL 33142

## SANITATION DEVICES

— POLLUTION CONTROL

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Microphor Inc.  
P.O. Box 490, Willits, CA 95490

Oil Mop, Inc.  
P.O. Box P. Belle Chasse, LA 70037

OMNIPURE  
6101 SW Freeway, Suite 100, Houston, TX 77057

Red Fox Industries Inc.  
P.O. Drawer 640, New Iberia, LA 70560

Tyson Industries Ltd.  
P.O. Box 51997, New Orleans, LA 70151

## SCAFFOLDING—PLATFORMS—BUILDINGS

Write 67 on Reader Service Card

Manlift, Inc.  
P.O. Box 21, Shady Grove, PA 17256

Mitchell Building Systems  
P.O. Drawer 911, Columbus, MS 39701

Patent Scaffolding  
One Bridge Plaza, Fort Lee, NJ 07024

Superscaf  
12900 Garden Grove Blvd., Suite 146, Garden Grove, CA 92643

Swiss Fabricating, Inc.  
811 Camp Horne Road, Pittsburgh, PA 15237

Trus-Joist Corporation Micro-Lam Division  
P.O. Box 7984, 3210 E. Amity Rd., Boise, ID 83707

Waco Ladder & Scaffolding Co., Inc.,  
P.O. Box 126, Brentwood, MD 20722

## STEELS—METALS—FORGINGS—ALLOYS

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Armco Inc., Southwestern Steel Division  
1455 West Loop South, Houston, TX 77027

Dibert, Bancroft & Ross Co., Ltd.  
P.O. Box 836, Amite, LA 70422

Huntington Alloys, Inc.  
Guyan River Rd., Huntington, WV 25720

Inland Steel  
30 West Monroe, Chicago, IL 60603

IML Metals Inc.  
2065 Fifth Ave., P.O. Box 306, Ronkonkama, NY 11779

The Metal Bank of America, Inc.  
6801 State Rd., Philadelphia, PA 19135

Millard Controlled Metals, Inc.  
5 Louise Dr., Ivyland, PA 18974

SiFco Selective Plating  
5708 Schaaf Rd., Cleveland, OH 44131

Thyssen Rheinstahl Technik, Div. of Thyssen Inc.  
1114 Avenue of the Americas, New York, NY 10036

## STEERING SYSTEMS

Write 70 on Reader Service Card

Anschuetz of America  
187 East Union Ave., East Rutherford, NJ 07073

Cunningham Marine Hydraulics Company, Inc.  
2030 East Adams St., Jacksonville, FL

Hyde Products, Inc.  
810 Sharon Dr., Cleveland, OH 44145

Hydrive America Corp.  
3629 Vernon Blvd., Long Island City, NY 11106

Kongsberg North America  
135 Fort Lee Rd., Leonia, NJ

Omnithruster Inc.  
9515 Sorensen Ave., Santa Fe Springs, CA 90670

Sperry  
Great Neck, NY 11020

SSI, Inc.  
P.O. Box 271, Station, Houma, LA 70361

## VALVES—FILTERS—STRAINERS

Write 71 on Reader Service Card

Chas. M. Bailey Co., Inc.  
1301 59th Street, Emeryville, CA

DEMCO, A division of Cooper Industries, Inc.  
P.O. Box 94700, Oklahoma City, OK

Dover Corporation/Norris Division  
P.O. Box 1739, 10 N. Elwood, Tulsa, OK 74101

Eugene Ernst Products Co.  
South Main St., Box 427, Farmingdale, NJ 07727

Green Marine and Industrial Equipment Co., Inc.  
1111 Central Ave., Metairie, LA 70001

Hayward Marine Products  
900 Fairmount Avenue, Elizabeth, NJ 07207

Henze Service, Div. ITT Grinnell Valve Co., Inc.  
2970 Cottage Hill Road, Suite 283, Mobile, AL 36606

Keene Corp.  
1571 Forrest Ave., LaGrange, GA 30240

Keystone Valve Division  
9700 West Gulf Bank Drive, Houston, TX 77040

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

Limitorque Corporation  
5114 Woodall Road, P.O. Box 11318, Lynchburg, VA 24506

Mar-Ind Supply, Inc.  
550 Townsend St., San Francisco, CA 94103

Newmans Inc.  
9 Joanna Ct., E. Brunswick, NJ 08816

Wm. W. Nugent & Co., Inc.  
3440 Cleveland Street, P.O. Box 948, Skokie, IL 60076

Pall Land & Marine Corporation  
Newport Richey, FL 33552

Parker Hannifin Corp., Filter Division  
16810 Fulton County Rd #2, Metamora, OH 43530

Pioneer Valve & Fitting Co., Inc.  
93 Siegel Street, Brooklyn, NY 11206

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

William Powell Co.  
2503 Spring Grove Ave., Cincinnati, OH 45214

Rockwell International - Flow Control Division  
400 N. Lexington Avenue, Pittsburgh, PA 15208

Stacey Valve Company, Inc.  
P.O. Box 377, Brooklyn, NY 11222

Stockham Valves & Fittings  
4000 10th Avenue North, Box 10326, Birmingham, AL 35202

Stow Manufacturing Co.  
P.O. Box 490, Binghamton, NY 13902

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

Technical Products & Precision Mfg. Co.  
3067 Unionville Pike, Hatfield, PA 19440

Teledyne Republic Manufacturing  
15655 Brookpark Road, Cleveland, OH

Velan Valve Corporation  
Avenue 'C', Griswold Industrial Park, Williston, VT 05495

Robert H. Wager Co., Inc.  
Passaic Avenue, Chatham, NJ 07928

Wheatley/Geosource, Inc.  
P.O. Box 3249, Tulsa, OK 74127

William E. Williams Valve Corp.  
38-52 Review Ave., Long Island City, NY 11101

Zidell Explorations, Inc.  
3121 S.W. Moody Avenue, Portland, OR

## WELDING EQUIPMENT AND PRODUCTS

Write 73 on Reader Service Card

Armco Inc. (Southwestern Steel Division)  
1455 West Loop South, Houston, TX 77027

Armorian Division  
P.O. Box 33569, Houston, TX 77233

Bernard Division/Dover Corporation  
Box 667, Beecher, IL 60401

Big-4 Manufacturing Company Inc.  
3223 Woodson Rd., St. Louis, MO 63114

CRC Automatic Welding  
50 Briar Hollow West, (6th Floor), Houston, TX

ESAB Engineering  
15800 West Hardy, Suite 580, Houston, TX 77060

The Lincoln Electric Company  
22801 St. Clair Avenue, Cleveland, OH 44117

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

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

To compile this directory, MARITIME REPORTER mailed questionnaires to all leading marine industry suppliers. This list is based on all replies received by press time.



Shown at a recent meeting of the Society of Marine Port Engineers are (standing left to right): J. Kennedy, unidentified guest, Cmdr. J. Todd, Edward English, John Antonetz; (seated left to right): James W. Elliott, Jr., (author); Thomas J. Young, William T. Dingnes and Benjamin A. Bailey.

## N.Y. Port Engineers Society Discusses Importance Of Propeller Finish

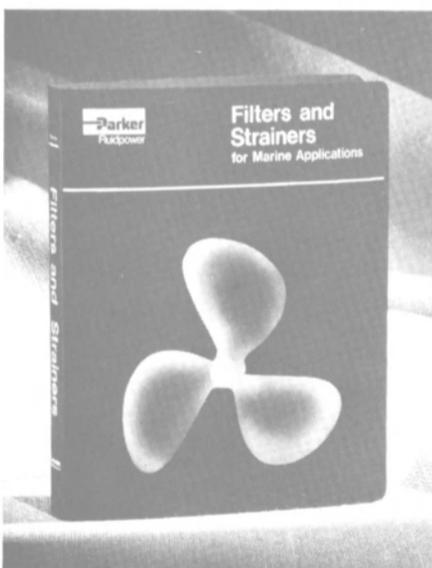
The recent meeting of The Society of Marine Port Engineers New York, N.Y. heard a paper titled "The Importance of Good Surface Finish on Large Diameter Propellers," presented by **James W. Elliott Jr.**, engineering manager at Michigan Wheel Gulf Coast, Inc., Pascagoula, Miss.

In introducing his paper the author said that the surface finish and configuration of a ship's propeller is one of the most important factors in maintaining maximum fuel efficiency. The deviation of various propeller characteristics from design contribute to loss of operating efficiency by creating

adverse water flow conditions that aid in the development of surface defects, he stated.

The author also discussed propeller surface characteristics as they pertain to water flow, and their relationship with cavitation. He detailed the effect of irregular surface finish, along with methods of inspection and repair of these discrepant conditions. He also gave some suggestions for development of an individual inspection and evaluation program in order that each propeller application can achieve optimum operational efficiency.

## New 54-Page Filters And Strainers Catalog Available At No Cost



The Filter Division of Parker Hannifin Corporation, Cleveland, Ohio, has available a new catalog, Filters and Strainers for Marine Applications. The catalog covers filters for hydraulic and lube oil applications such as bow thrusters, trawl winches, gear boxes, steering systems and deck equipment. Products include duplex and simplex strainers, high pressure micronic filters, low pressure suc-

tion and return line filters, and portable filter carts.

The catalog consists of six product bulletins of 54 total pages contained in a sturdy three-ring binder. An introductory section lists several vessels on which Parker filters are presently installed, and acknowledges U.S. Coast Guard and U.S. Navy accepted applications.

For a free copy of the Parker Hannifin catalog of Filters and Strainers for Marine Applications,

Write 35 on Reader Service Card

## Field, Wigham Represents Granges Repair In The U.S.

Granges Repair Service GmbH of Hamburg, Germany, a worldwide in-place machining service for shipping and industry, has announced the appointment of Field, Wigham & Co., Inc. of Great Neck, N.Y., as their sales representative in the United States. Granges specializes in on-site crankshaft grinding, line-boring, machining, chocking and welding on ships and offshore platforms throughout the world.

At its Hamburg workshops, Granges specializes in such re-conditioning of spare parts as welding of cracked pistons, cylinder covers and valves, hard chroming of pis-

ton ring grooves, and the like. All work accomplished by Granges, on site or in their workshops, is fully guaranteed.

**S.B. Field** is president of Field, Wigham & Co., Inc., which is located at Box 2123, 200 Middle Neck Road South, Great Neck, N.Y. 11021, Telephone: 516-466-5340.

For further information on this service,

Write 27 on Reader Service Card

## Jamesbury Announces Fusible Spring-Return Actuators For Large Valves

New Jamesbury Series FSR fusible spring-return actuators for larger valves provide for automatic emergency closing or opening of a valve in the event of a fire or other unwanted temperature rise. The actuator is cocked to set the valve in the desired operating position (either open or closed) by manually overriding the driver with a wrench and then tightening the adjusting screw that retains the compressed spring.

In a fire, a high-load fuse weakens, releasing the adjusting screw and causing the immediate return of the valve to its spring driven position. Two Series FSR actuator sizes, with torque outputs of 30 and 90 foot-pounds are available to permit sizing to various valves.

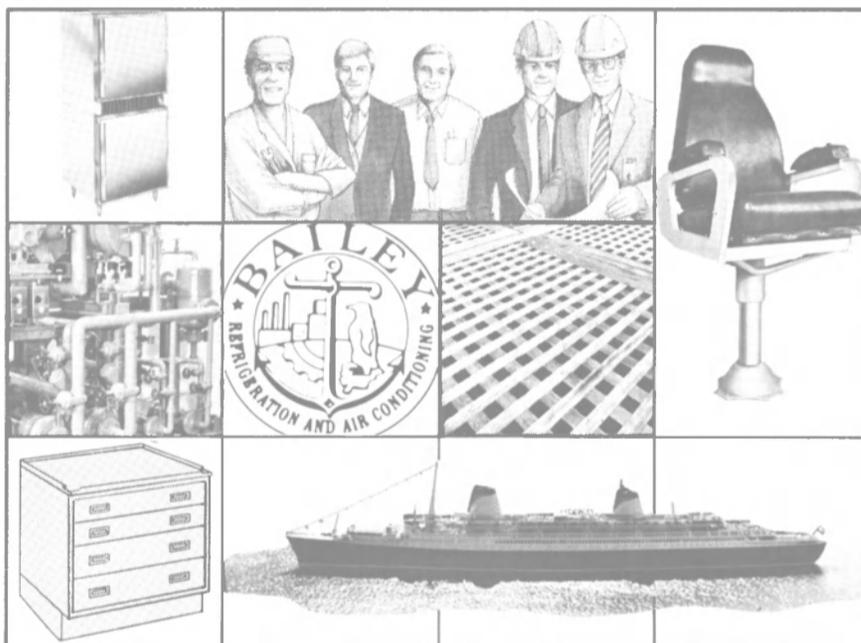
Size range for Jamesbury ball valves is 2 to 4 inches, for wafer-sphere butterfly valves from 3 to 8 inches. For smaller ball valves, Jamesbury Torq-Handle™ spring-return handles with fusible line are recommended.

For more information on the New Jamesbury Series FSR fusible spring-return actuators,

Write 36 on Reader Service Card

## Northwest Marine Awarded \$9.9-Million Navy Contract

Northwest Marine Iron Works, Portland, Ore., has been awarded a \$9,899,356 firm-fixed-price contract for overhaul and upgrading of the Military Sealift Command scientific support ship USNS Observation Island. The Military Sealift Command, Washington, D.C., is the contracting activity.



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Bailey Carpenter & Insulation Company, Inc.**

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NEW ORLEANS, LA 70117 2621 Arkansas Avenue (804) 855-0401  
WASHINGTON, DC (703) 750-1901



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## Halter Marine Completes Contract With Tidewater



The 192-foot supply boat Tiger Tide, built by Halter Marine for Tidewater, is powered by EMD engines.

Halter Marine, Inc., New Orleans, La., has completed an 11 supply boat contract with Tidewater Marine, Inc. with the delivery of the 192-foot Tiger Tide.

The Tiger Tide is 192 feet 6 inches with a 40-foot beam and 14-foot depth. She is powered by two EMD 16-645E7B diesel engines developing 2,305 hp each at 900 rpm. They drive two 90-inch-diameter four-bladed propellers through Lufkin RH 2322 reverse-reduction gears with a ratio of 3.0:1. The main engines and gears are cooled by six Fernstrum grid coolers.

There are three Mathers pneumatic control systems aboard and a 24-point engine alarm system provided by SSI. The hydraulic/electric steering system was also supplied by SSI. A

Schottel S-152L bow thruster driven by a Detroit Diesel 8V71 improves station keeping and maneuverability. The main switchboard, distribution panels, and generator control panels were manufactured by Continental Electric Service Corporation. Auxiliary power is supplied by two Detroit Diesel 8V71 diesel engines through two Delco 125-kw generators. Aurora pumps service bilge, ballast, fuel oil transfer and the on and off ship fire-fighting systems. The fuel oil separator was manufactured by Westfalia. The sanitary water system contains a Myers pressure set with an 82-gallon Harvard tank.

Navigation and communications equipment include: two Decca RM916C radars; a Furuno P860F sounder; two Sailor VHF radios; Ritchie compass; a RFM230M SSB radio; an NCS Wherefinder II; a Sperry MK37 Gyro with repeater; and a Sperry 8T autopilot and gyro interface.

Some of the deck equipment includes: a Smatco 72 DAW double drum tow/anchor-handling winch driven by a Detroit Diesel 12V71 engine with a line pull of 150 tons; a Smatco 1500 EAD-30 anchor windlass with a 35,000-pound line pull; a Smatco single drum hydraulic tugger with multiple disc brakes; and a 5-foot by 8-foot Halmar stern roller.

Living and working spaces are heated and cooled by a 17-ton Carrier system. Eight staterooms provide berths for 16 persons.

The Tiger Tide was built at Halter's Moss Point, Mississippi division, one of six shipyards owned and operated by Halter in the Southeastern United States. Halter is one of

the world's largest builders of supply vessels for the offshore oil and gas industry.

## Maritime Industries Supplies Strut Drive Propulsion Units —Literature Available



The 49-foot Pacific Pilot Six is powered by Detroit Diesel engines and Maritime Industry "strut drives."

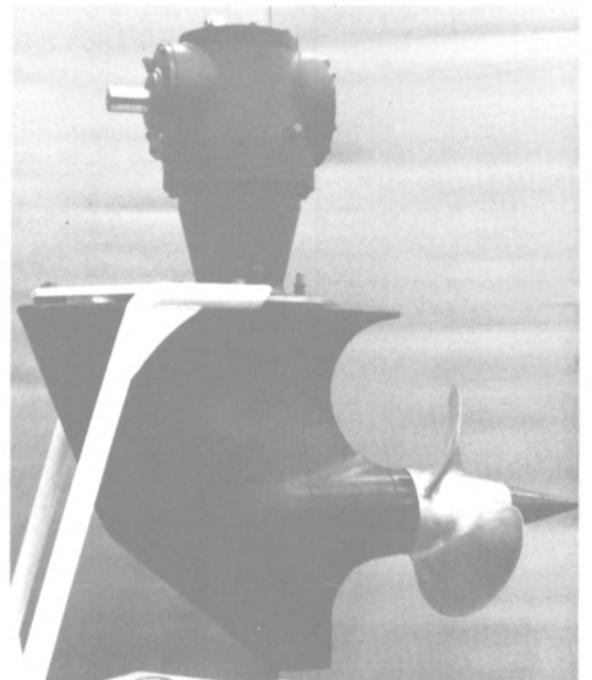
Maritime Industries Ltd., Vancouver, Canada, supplied the propulsion units for the recently commissioned Pacific Pilotage Authority vessel, Pacific Pilot VI, now in service as a pilot boat from Victoria, B.C., Canada.

The vessel was designed by David Moore of Shore Boatbuilders who were also the constructors of the vessel. The overall length is 49 feet and it has a service speed in excess of 20 knots.

The twin strut drive offers unique advantages in both performance and space. They are commercially rated and robustly designed to withstand impact such as log debris. Strut drive also provides horizontal thrust, thereby increasing performance compared with conventional shaft drives. Casings for the Model MC-300 and its larger companion, the MC-500, are constructed of aluminum. The engines driving these units are Detroit Diesel 8V71's, rated at 286 hp at 2,100 rpm. Current applications for the unit also include crewboats and luxury yachts. The technology of the strut drive is based on Maritime's 15 years' experience in steerable drives which they have manufactured in horsepower up to 3,000.

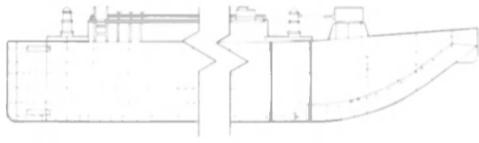
For further information on the strut drive,

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## Richard Baumler Named President Of American Ship's Tampa Shipyards

Richard J. Baumler has joined The American Ship Building Company as president of Tampa Shipyards, Inc., it was announced by George A. Chandler, president of The American Ship Building Company.

Mr. Baumler replaces Ralph F. Anselmi, who is retiring after 44 years in the shipbuilding industry. Mr. Baumler most recently was vice president of ship construction for Sea Land Service, Inc. Prior to that, he was with St. John Shipbuilding & Drydock Company, New Brunswick, Canada, as vice president of operations, and with Newport News Shipbuilding from 1955 to 1976 in various capacities including general manager-commercial ships. He served with the United States Navy as Lieutenant-Engineering Officer from 1953 to 1955.

## John Crane Appoints Trytek VP Marketing

Joseph J. Trytek has been promoted to vice president of the marine and government marketing division of John Crane, it was announced by George McLaughlin, vice president of sales and marketing.

Throughout his career with Crane, Mr. Trytek has been associated with the company's operations in the marine market. He has earned several patents and developed various marine sealing products.

His first assignment with John Crane in 1970 was in an analysis group responsible for developing sealing programs for the nuclear power industry. He became general manager of marine and government operations last year.

John Crane is one of the world's largest manufacturers of engineered sealing systems.

## \$8.5-Million Navy Contract Awarded To Stewart Warner

Stewart Warner Corporation, Chicago, Ill., has been awarded an \$8,557,323 fixed-price contract for 544 AN/URT-23 radio transmitters, 391 R-1051/URR radio receivers, and 262 T-827/URT transmitters for ship and shore use. The Naval Electronic Systems Command, Washington, D.C., is the contracting activity.

## Great Lakes Towing Christens 250-Ton Drydock

The Favorite, a 250-ton steel drydock owned and operated by The Great Lakes Towing Company, Cleveland, Ohio, was recently christened. It is reportedly the largest Lake Erie drydock specifically designed for commercial small craft, such as tugboats and

floating equipment.

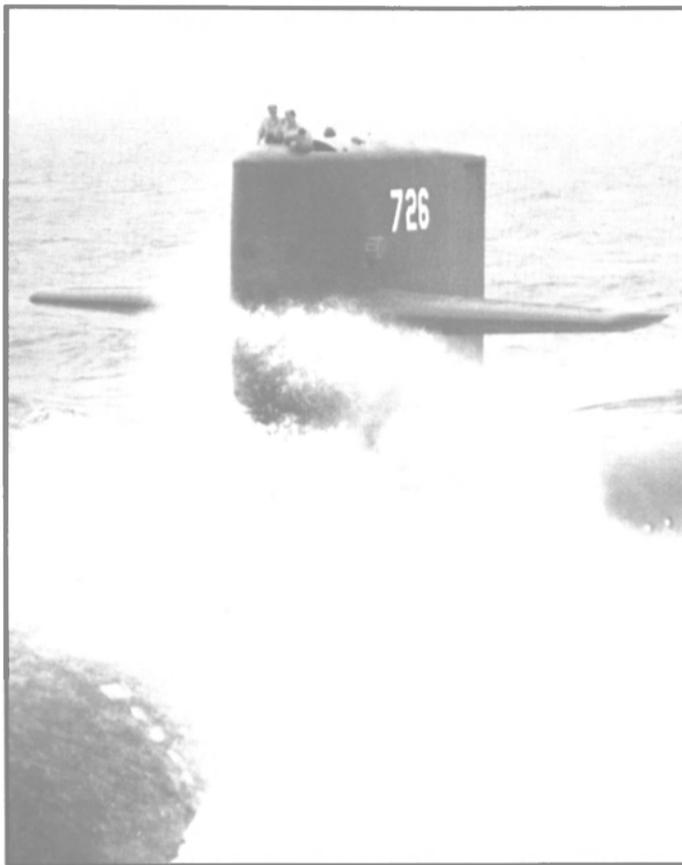
Mrs. Ronald C. Rasmus, wife of the president of The Great Lakes Towing Company, sponsored the drydock by shattering the traditional bottle of champagne. She was assisted by Matrons of Honor Mrs. Frank Fauver and Mrs. W. Joe White.

The Favorite, constructed at The

Great Lakes Towing Company Shipyard on the Old River Bend at Division Avenue, Cleveland, is 90 feet long with a distance between wing walls of 36 feet.

Capable of performing extensive marine repairs and maintenance for its own fleet of 39 tugboats, The Great Lakes Towing Company Shipyard will now expand its

services to include the commercial drydocking of tugboats, floating equipment, fishing boats and yachts. W. Joe White, manager of the shipyard, stated that "the Favorite will make sorely needed commercial drydocking services available in the Cleveland area since heretofore the nearest drydock for small craft was in Detroit."



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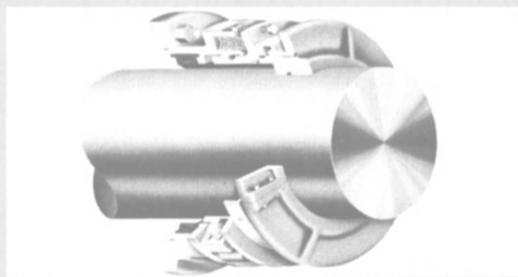
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## TCS Cuts Barge-Moving Costs With New Winch-Control System

Bulk-carrying river barges often look as if they are floating effortlessly upon the waters, but St. Paul, Minn.-based TCS Industrial knows that it takes a lot of power to handle one. Therefore, specially designed barge-moving systems are a must for any terminal dock.

TCS Industrial's solution to this load-handling problem has been to use two side-by-side winches powered by an electro-hydraulic power unit feeding low-speed, high-torque motors. Wire rope runs from each winch to a connecting link which is secured to the barge to control its movement. It is reaved around various sheaves to form a continuous loop arrangement, which allows its end to return to the second winch situated next to the first one. Proper tension is applied to the lines to hold the barge in its selected position and, when it must be moved forward or backward under the loading spout, the proper winch is activated to move it in the right direction. As one winch takes in line the other pays it out.

The system works well, with two notable exceptions. Cavitation takes place when the oil is subjected to a vacuum at the inlet of the motor (which is at the time acting as a pump), and vaporizes. Also, the band-type brakes cause problems. Every time it rained the open bands would swell up and become tight, requiring an employee

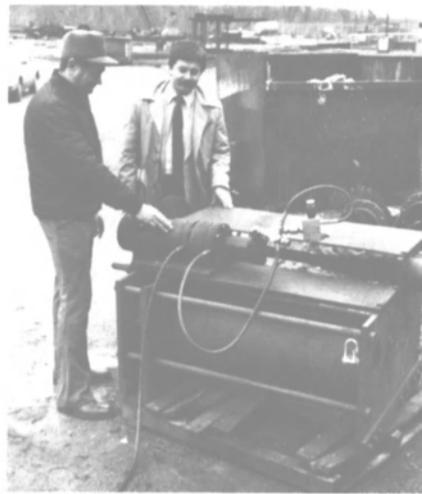
to be constantly on hand to adjust them. The brakes' actuating cylinders also often leaked.

Searching for a solution, TCS Industrial engineers worked with applications engineers at the local J.N. Fauver Company office. This team analyzed the problem and realized it had two basic options. One was to build a hydraulic bypass into the system so the motor would not starve or cavitate. This solution has since been retrofitted on units already in the field.

The other option, the one selected for the new system, was to hydraulically disengage the unused motor from the circuit with an Ausco hydraulic clutch. This new design also used a totally enclosed Ausco failsafe brake, which completely eliminates both the adjustment and leaking problem previously encountered when using open-type brakes.

Each of the two winches now includes an overhung load adapter, with the Ausco failsafe brake piggybacked to it. Next comes the clutch and then the motor. Using direct-spline shafts and matched SAE mountings, it really becomes an integral drive train that eliminates the problems previously experienced.

The failsafe brakes are spring applied and hydraulically released. When hydraulic pressure is applied to a motor through a



TCS Industrial's Donald Seiford (left) discusses new winch drive with Ray King, a Fauver Company technician who helped engineer the new barge-moving system.

shuttle valve, the pressure also goes to the brake cylinder and releases the brake discs. When pressure is released the built-in springs automatically re-apply the brake. The units are completely enclosed, which precludes water from affecting their performance.

The advantages of the system are obvious. Each of the two winches has its own drive train. To move a barge the operator activates a hand-held, electrical-proportional hydraulic control valve, which releases both brakes so one cable can pay out while the other is being wound on a drum. As the control valve releases the brakes it also starts to direct oil through the hydraulic motors. As they turn, the exiting oil flows over a load control which creates a back pressure signal that is read by the

clutch in the winch system that is taking in the line, and it actuates to turn the winch. But the other clutch does not receive such a signal so its hydraulic motor does not turn backwards. Because it is "de-clutched" the motor rests as the line pays out.

These new changes have solved the problems previously encountered. The heart of the system is the electro-hydraulic power unit situated at any convenient location at the terminal. In addition to barge moving, the hydraulic circuitry may be configured to provide power for other requirements, such as spout handling or cover pulling. Proportional controls allow a variable-speed movement between 0 to 50 fpm, moving up to four barges at one time. The system provides an efficient and positive method of moving empty or loaded barges between mooring points at a dock, terminal or other marine facilities, whether the duty cycle is continuous or the frequency of movement is intermittent, with local or remote (or both) radio or pendant variable-speed control.

For complete details on the new barge moving system,

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## Kone Reports USA Is Its Largest Crane Market

The Kone Corporation, a Finnish multi-national corporation, reports that its 1983 sales in the United States will exceed \$100-million.

Kone has recently concluded a number of large crane contracts in the United States. The International Terminal Operating Company of New York has purchased a container-handling crane. Another was sold to the Port Everglades Authority in Florida. Newport News Shipbuilding, one of the largest United States shipbuilders, has also contracted for six 300-foot cranes which were shipped to the United States already erected.

Kone products sold in the United States also include ramps and hatches.

For free literature on Kone cranes ramps and hatches

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## Brown & Root Receives \$10-Million Contract

Brown & Root, Inc., Houston, Texas, has received a contract from Seagull Energy Corp. through its wholly owned subsidiary, Seagull Transmission Co., to install 44.3 miles of gas pipeline in the Gulf of Mexico. Brown & Root, a Halliburton company, is one of the world's most diversified engineering and construction firms.

The 24-inch and 12-inch concrete-coated pipelines will be installed in water depths ranging from 50 feet to the shore. Brown & Root will use BAR 324 and BAR

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355 to lay the line and BAR 228 and BAR 280 to trench the pipe.

The \$10-million contract is part of a gas gathering system for Seagull Shoreline System, a partnership consisting of Seagull Transmission Co., Northern Intrastate Pipeline Co., and HNG Offshore Co. Installation is scheduled for completion in late 1983.

### Financial Moratorium At Verolme Botlek Lifted

The suspension of payments (the Dutch equivalent of Chapter XI) for the ship and offshore repair yard Verolme Botlek B.V. Rotterdam and for its 100 percent subsidiary Verolme Tankcleaning Company B.V. has been lifted. They continue their activities as independent companies, the shares of which are being transferred to a trustee. The suspension payment was imposed in February 1983 because of serious financial difficulties of the RSV holding company.

Verolme Botlek is a sound company and as such the suspension of payments was not necessary; however, as a consequence of the joint liability for certain RSV-debts, all 100 percent owned Dutch RSV companies entered into moratorium as well.

The reason that the suspension of payment lasted more than six months is mainly attributable to the extremely complicated financial and legal cross connections that existed within the RSV Group. Also, a new starting position had to be drawn up for Verolme Botlek in order to enter the future as a strong company. The ending of the suspension of payment is based on full satisfaction of the creditors.

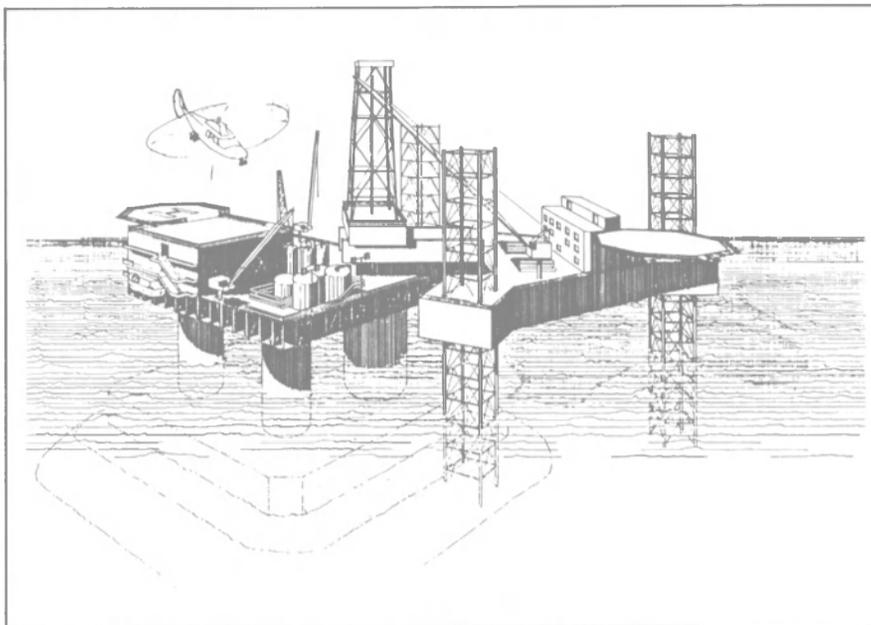
The Verolme Botlek yard and Verolme Tankcleaning are represented in the U.S. by Midland Marine Corporation of New York City.

For additional information,  
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### Flynn Appointed Traffic Manager At Foster Wheeler

Robert P. Flynn has been appointed general traffic manager of the purchasing department, equipment division of Foster Wheeler Energy Corporation, Livingston, N.J.

Mr. Flynn joined Foster Wheeler in May 1972 as an assistant general traffic manager. He was formerly export traffic manager for the E.W. Bliss Company and export documentation manager for the Maron Shipping Agency. He served from 1960 to 1963 in the U.S. Navy. A 1959 graduate of Erasmus Hall High School, he graduated from the La Salle University, School of Traffic & Transportation in 1972. He is a member of the Raritan Traffic Club, Newark Traffic Club, and New York Traffic Club. Mr. Flynn belongs to the Ocean Country Cub Scout Council, Pack 2.



Venture concrete offshore platform.

## Concrete Offshore Platform Designed By Foundation-Skanska

The Foundation Company of Canada Limited, in joint venture with Skanska of Sweden, has proposed a concrete platform to Mobil Oil Canada for use in the Venture gas field off Nova Scotia. Designed for use in 22 meters (72+ feet) of water, the platform is a scaled-down version of the behemoth structures used in the North Sea.

Foundation has been involved in marine work since its inception in

1910, and feels that concrete-base gravity structures can be built for less cost than an equivalent complex of steel jackets as is currently proposed for Venture.

John Otter, vice president of engineering, says that Foundation-Skanska estimates the cost of construction and installation of two jackets to be approximately C\$62 million. These platforms would replace the two complexes

of steel jackets described in Mobil's recent environmental impact statement. Construction work would provide approximately 690 man-years of directly related labor, of which some 630 man-years would be generated in ordinary construction trades in the Halifax/Dartmouth area. Materials and equipment would also be procured locally, stimulating the depressed Nova Scotia construction industry infrastructure. The attraction of this scheme is that the necessary skills and equipment are readily available, today, within the Province.

Foundation claims that the shift from steel to concrete would not be at the expense of the local steel fabrication industry because the Mobil Venture environmental impact statement currently envisages only about one-third of total steel fabrication work being performed in the Province. Even with concrete supporting structures, platform integrated decks will require some 10,000 tons of steelwork and modules—work that will go to unemployed Nova Scotian welders and fitters. Local labor demand should therefore be increased by the use of concrete gravity platforms.

Foundation and its joint-venture partner are considering setting up separate facilities for the construction of the concrete platform bases and the fabrication of integrated modules for platform decks and topsides that will utilize existing Foundation Company property and involve some additional expansion. Further action will depend upon positive responses from industry and the Venture Field operator, Mobil Oil Canada Limited.



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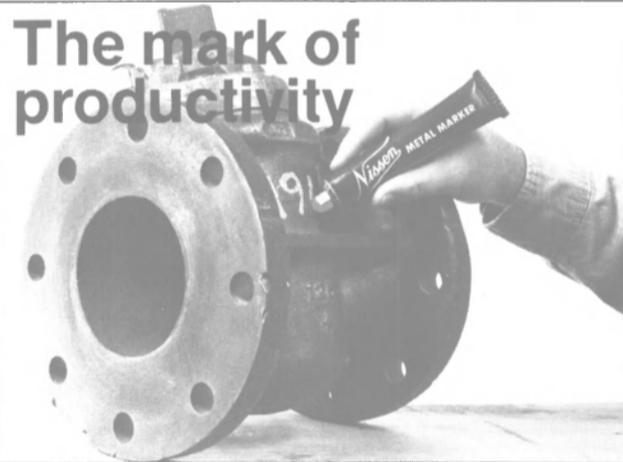
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An Exxon multi product carrier takes shape at Avondale

## Productivity Advances In Shipbuilding

### The Desire To Reduce Shipyard Production Manhours Leads Avondale To Production-Line Ship Construction

James R. Wilkins Jr.\*

During World War II, ships were built in the United States at a rate which may well have been the most productive in terms of ships per day being produced that has ever been accomplished. A major reason for that productivity was that many ships of the same type were constructed one after another in a given shipyard. This allowed utilization of special tooling and allowed personnel to become proficient in accomplishing the same task over and over again. In many ways, production-line techniques

could be, and were, utilized in the construction. Another significant advantage was the ability to make large quantity procurements of equipment and materials. After World War II, the shipbuilding practices which had been common prior to the war became common again.

During the ensuing 20 years, shipyards in other countries, such as Japan and in Europe, were developed or modernized using up-to-date production engineering principles. By the early 1970s it was clear that most shipbuilding in the world was being accomplished outside the United States.

At that time, the Maritime Administration conducted several investigations of worldwide shipbuilding practices and provided seed money for shipyards to at-

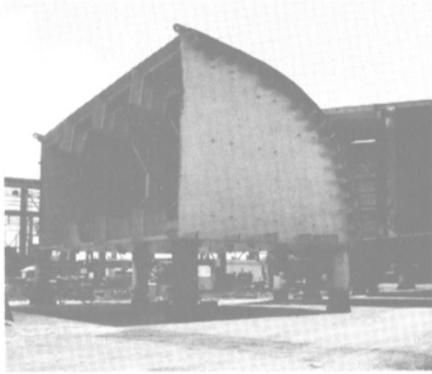
tempt to improve their own capability for decreasing shipbuilding costs. Many shipyards also made independent efforts to investigate foreign shipyards and to investigate new shipbuilding techniques.

One of the most notable efforts was the then new shipyard at Pascagoula, Miss., established by Litton/Ingalls. It was based largely around automated machinery, a good flow of materials into the areas where fabrication took place, and a concept of building ships in large sections which were outfitted as they were being built. These sections were then welded together and launched, using a launch platform. These were very innovative steps which were well suited to building runs of several ships.

For another example, Avondale

Shipyards (ASI) sent a team of engineers to Japan and to Europe as early as 1972 to investigate the techniques used by Japanese and European shipbuilders. Somewhere in that time frame, as the world demand for ships decreased, some of the Japanese companies decided that it was to their advantage to begin to export the technology which they had been using to build ships so effectively. The combination of these several efforts resulted, at Avondale, in a commitment by Avondale management to have a Japanese company, Ishikawajima-Harima Heavy Industries Co. (IHI), make an in-depth study of the way Avondale was building ships and make recommendations to Avondale for things which could be done to improve productivity.

\*Dr. Wilkins, group vice president, engineering, Avondale Shipyards, presented the paper condensed here before a recent meeting of the Gulf Section of The Society of Naval Architects and Marine Engineers, held in New Orleans, La.



Consequently, a contract was signed in 1974 which resulted in five Japanese engineers being assigned by IHI to Avondale Shipyards. These men have been participating directly with Avondale employees in the planning and construction of a new class of product carriers which Avondale had contracted to build for Exxon.

The approach recommended by IHI required major changes to the existing sequence of construction and resulted in major changes to the type and timing of the design effort.

Recognizing the potential advantage to Exxon, as well as to Avondale, of the new techniques Avondale was trying to use, Exxon participated fully with Avondale in studies of the details of the ship design and with modifications to the ship design. This degree of involvement between the owner and the shipbuilder at this stage of the design process was unprecedented in ASI's commercial experience. The result was a period of about six months prior to the actual award of the construction contract during which Avondale and Exxon engineers went through the design to identify to the maximum extent possible all major items of equipment and the system design of all systems which would be installed in the ship. The goal was to have a completely defined package decided upon prior to the award of the contract to build that package.

Although the design changes were important, the primary emphasis of this first effort at Avondale was directed at the production effort—at reducing production manhours. There are three major conceptual approaches which, in combination, have effected an entirely different approach to building ships at Avondale.

#### Production Line

The first of these changed construction approaches might be called a "production line" ship-construction technique. Instead of laying the keel on the shipbuilding ways and constructing the ship progressively from the keel up and from the middle of the ship toward each end, with the "production line" approach, sections of the ship are moved along from position to position in the shipyard. At each position, certain types of work are accomplished. After work

on a unit is completed at one position, the unit is moved to another position for additional types of work to be done.

This results in many units of the ship being constructed simultaneously in different parts of the shipyard. Only after each unit is complete is it moved to the shipbuilding ways for assembly into the ship itself. Of course, we do erect these units on the ways,

from the keel up and from the machinery space forward and aft, but the pieces which we erect are whole units of the ship with as much piping and equipment already installed as it is economical to do.

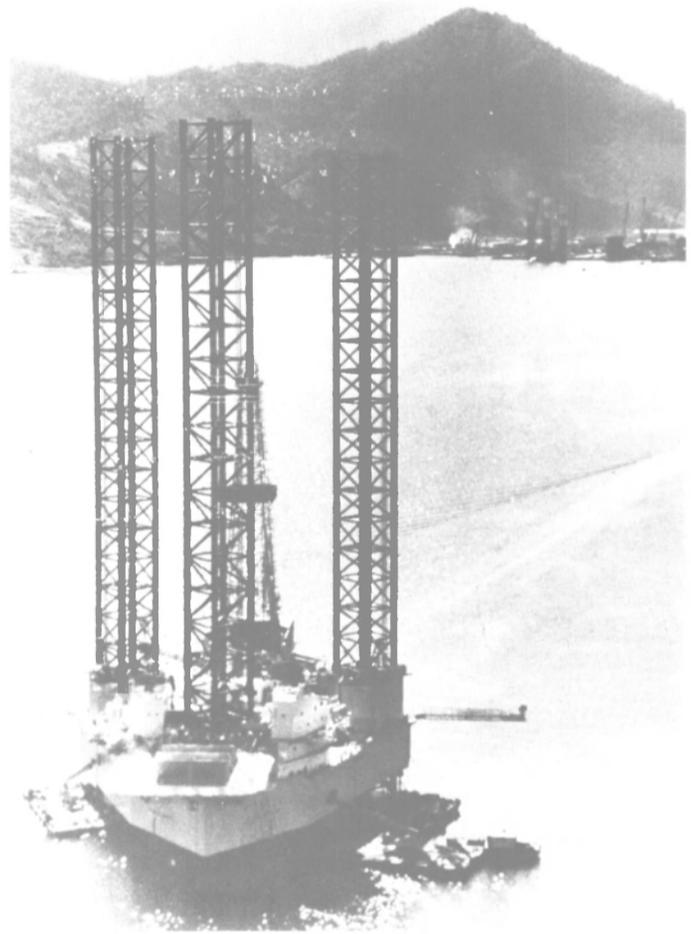
The process begins with an analysis of the entire structure of the ship, breaking it down into units which are suitable for handling with the shipyard cranes

and other facility capacities. Under the tutelage of our Japanese advisors, Avondale production personnel classified each portion of the hull into one of six different categories, depending on the complexity of each category to be built. The simplest category is one constructed of flat pieces of material welded together. Fortunately, more than half of the units of the

(continued on page 40)

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## Productivity Advances

### In Shipbuilding

(continued from page 39)

ship are constructed of these relatively easy-to-build units.

At least part of the art of breaking the ship up into units is to select as many units as possible which can be constructed using the techniques associated with the less complicated categories. Then, again under the guidance of IHI advisors, Avondale set aside certain areas of the shipyard where this type of construction would be carried out exclusively.

The result is that in the areas where this type of construction is accomplished, the workers accomplish exactly the same kind of work each day. As they complete one section, the ship section moves to the next work site, and another section is constructed at the first site by the same people using exactly the same techniques. This then leads to the description of this process as a "production-line shipbuilding technique."

### Outfitting

The second major change in technique is the installation of piping, ventilation and other systems on each of these units as they are being constructed. Thus, after one unit of the hull reaches the appropriate level of construction, it will be moved to a location in the shipyard where the pipefitters and ventilation people and other system installers will take over and install their systems. This is called "outfitting" the unit.

Following outfitting, the section of hull may go to a different spot in the shipyard where another piece of plate will be added to cover up that area that has just been worked on. In this way, each system is installed at the point of construction where it is most easily installed. One essential point to note at this point of construction is that the design of the entire piping system in that portion of the ship must already have been completed.

Thus, by the time the entire unit is ready to be erected at the erection site, the majority of all the internal work has already been accomplished. All that remains to be done is to join the piping systems in one unit to the piping systems in another unit with short lengths of pipe called connecting pieces. The wireways for electrical installations will be installed during this period but the cables actually are run after the units have been assembled.

### Packaging

The third major difference in construction technique involves utilization of so-called "package units." The package unit is a combination of related equipment, such as pumps, controllers, gageboards, etc., constructed and installed on

their foundations and all piped and wired. It is completed as a package with the entire system constructed and tested before installation.

### Engineering

Now, concerning the engineering efforts. This requires a considerably different effort on the part of the design and engineering personnel in order to effect these savings for production personnel.

The entire design must be virtually complete before production can efficiently start. For example, the first production effort related to most pieces of steel structure is to cut the piece out of a larger piece. That is also the most efficient point of construction to cut all of the holes which must be cut in that piece. However, in order to know where to cut all the holes, the detailed design and routing of every piece of piping, or ducting, or electrical cable which will finally pass through that piece of steel must be complete.

The result of these many changes was a considerably larger engineering effort on this first project, compared to the "conventional" technique. However, the payoff was in the many fewer hours spent in production correcting the interferences between the larger and the smaller sections of piping.

Another aspect of the design process is the need to identify all of the equipment which will be installed on the ship right at the very beginning of the design process. In order to minimize the wastage of time it is mandatory that we know precisely what pumps, what engines, what gear, etc., will be installed in the ship as soon as possible after the design effort begins.

The results to date have been very satisfying to Avondale's management. Avondale's production manhours have been significantly reduced compared to the manhours which would have been expected had the ships been built in the "conventional" manner. The reduction in production manhours have much more than offset the increase in engineering manhours in this first effort to apply the new shipbuilding technique.

Needless to say, Avondale is not alone. Most other shipyards in this country are adopting the majority of these concepts in their building process today. So we can definitely say that the productivity of U.S. shipyards is improving.

Of course, production and engineering labor costs are not the whole cost story. Analyses of shipbuilding, whether in the U.S. or abroad, have demonstrated that approximately half of the cost of a commercial ship is in material. Thus, even if we were to reduce manhours in half, we will still not be as competitive in the world market as we want to be until the material and equipment costs can be made competitive.

## National Marine Names Mangan Service Manager



Phillip S. Mangan

Phillip S. (Scott) Mangan has been named Service Manager of National Marine Service Incorporated's East Coast Operations. He will be headquartered at National Marine's new diesel engine repair and parts facility, 4580 Village Avenue, Norfolk, Va. 23502, and reports directly to the regional manager, Bill Dotson.

Mr. Mangan joined National Marine in 1974 at its shipyard engine repair facility in Hartford, Ill. After an initial assignment as a mechanic, he was appointed to a lead foreman position, traveling worldwide on commercial and government marine engine overhauls, troubleshootings and other repairs. He will be responsible for all service work/repair crews assigned to the Norfolk facility and operating at the shop or at job locations along the East Coast and overseas.

National Marine Service, one of the Nicor basic energy companies, is a leading supplier of liquid bulk transportation services on the Mississippi River system and Gulf Coast. The company's shipyards at Hartford, Ill. and Harvey, La., offer full-service facilities for barge and towboat repairs. Its diesel engine repair services are widely recognized in the United States; its repair crew services the needs of customers in all parts of the world.

## Fetterolf Acquires Stacey Valve Products —Literature Available

Fetterolf Corporation of Skipack, Pa., has acquired the Stacey Valve product line, and is currently manufacturing and marketing Stacey® Line Blinds on a worldwide basis.

J.W. Williams, president of Fetterolf Corporation, stated in an interview: "Up until now, our endeavors have been concentrated in severe service/lethal gas applications. Now, with the Stacey product line, we have the products to meet the requirements of the all important Maritime Industry."

Proven Stacey Line Blind Valves provide positive, dead-tight shut-off of liquids, gasses or slurries in standard piping from 1 inch through 36 inches. Other sizes can be custom made to meet any spec-

ification. The Line Blind Valves are available in all ASNI pressure ratings in a wide variety of sizes and body materials for service temperatures from cryogenic to 1400° F. Fetterolf has unique coating technologies to allow the valves to perform in the most severe salt water environments.

In addition to dead-tight shutoff, Stacey Line Blinds are easily operated. Mr. Williams states: "With the Stacey, one man can position a blind in a matter of minutes. It usually takes three men up to an hour. Even at a distance, a glance is all it takes to determine whether a Stacey valve is open or closed. This is another important safety feature. Safety is finally easy."

For additional information on Stacey/Fetterolf valves,

Write 24 on Reader Service Card

## North Florida Shipyard Acquires Floating Drydock

North Florida Shipyard at Commodore's Point in Jacksonville has acquired a floating drydock to accommodate vessels to 475 feet long and 68 foot beam. The drydock has a lift capacity of 6,500 tons; a length of 448 feet; width of 97 feet and a draft of 16 feet.

Exclusive representative for the shipyard is Richard F. O'Boyle, Inc., New York, N.Y.

## Charles Hall Appointed Sales Manager-Marketing Development For Petromar

Charles LeBlanc, chairman and president of Petromar Corporation, Rockport, Texas, has announced that Charles Hall has been appointed to the newly created corporate position of sales manager-marketing development. "Charles Hall brings a vast amount of marketing, business development and general operational planning experience to our company," Mr. LeBlanc said. "He will assist us in the growth and expansion of the firm."

Mr. Hall, recently affiliated with Halter Marine, Inc., of New Orleans in marketing and sales, has an extensive marketing background in both domestic and international fields of marine shipbuilding. He is a member of The Society of Naval Architects and Marine Engineers, and the Marine Technology Society. He will be based in Petromar's corporate headquarters in Rockport.

Petromar operates a fleet of anchor-handling tug/supply vessels in the North Sea, Southeast Asia, West Africa and the Middle East.

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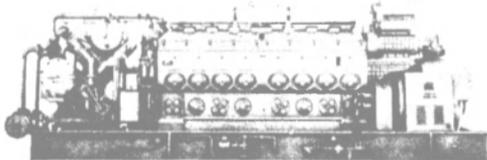
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- (4) Reconditioned Farrel Birmingham - 3600 H.P., 2 pinion reduction gears 3.6 to 1 - 900 RPM input, 225 RPM output - Equal to new - \$7,500 each.
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- (5) Reconditioned General Electric S234 reduction gears 4950 - 1750 RPM - 700 - 1000 H.P. - \$4,500 each.
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- (2) Cummins VT12-800 generator sets. 450 KW, skid mounted, radiator cooled, 440 volt, 3 phase, 60 Hz. Less than 2000 hours.

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- (2) Enterprise DSG6 12 x 15 generators, used, with 250 KW Elliot generators. Used for parts. \$5,500 each.

## TURBO-GENERATORS

- (1) 1000 KW Westinghouse turbo-generator, 440 volt -580# steam - 28" vac.

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- (2) Coffin Type DE feed pumps, capacity 500 GPM at 950 PSI. Used, in excellent condition. \$7,500 each.

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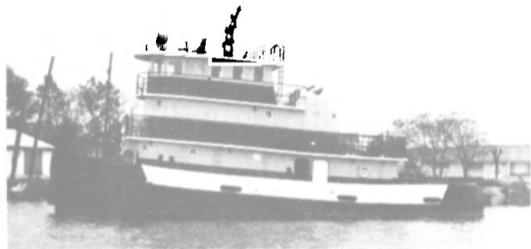
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# BUYERS DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER/Engineering News. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all 24 issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR/EN assumes no responsibility for errors. If you are interested in having your company listed in this Buyers Directory Section, contact John C. O'Malley at (212) 689-3266.

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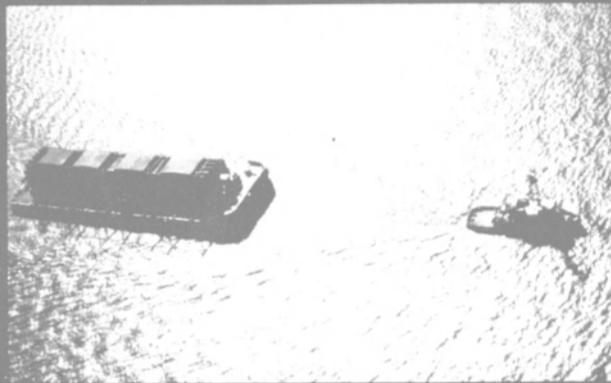


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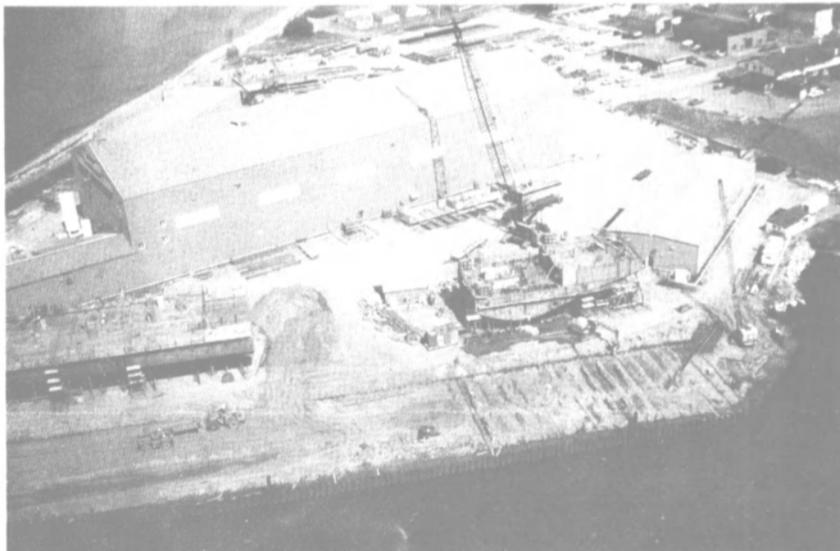
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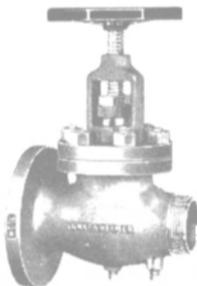
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## Armco Adds Forging Capability For Stainless-Steel Products —Free Literature Available

Armco's Stainless Steel Division, Baltimore, Md., producer of boat shafts and stainless steel for other marine and industrial products, has become the country's first integrated specialty steelmaker to begin operation of a precision rotary forging complex.

"The finished products will have significantly improved mechanical properties and surface quality, among other things," said **F.H. Cheffy**, president of the division. "Quality and variety will be far greater than possible with most conventional forging processes."

"The forging facility is part of a \$30-million program which will also add continuous casting capability to the Baltimore Works," Mr. **Cheffy** said.

Forging is done with four high-powered hammers striking the workpiece at the rate of 200 strokes a minute. Each stroke reduces the diameter of the ingot and increases the length until the billet or other desired shape is completed. The manipulators feed and rotate the piece so that it will not be moving at the instant the hammers strike, eliminating twist and stretch that can mar the quality of the forged piece. Internal quality is superior because the precision rotary forging machine does not require repeated re-heating and conditioning. Its high forging speed maintains the temperature of the workpiece. Round forged shapes can be produced as small as 4 inches in diameter, and flat forged shapes can be produced with cross sections ranging from 2.5 by 5 inches to 12 by 14 inches; all configurations can be made up to 39 feet long.

Operators can use computers to direct and monitor the complete forging operation or, if desired, operate the machine manually or semi-automatically. **Dennis Jensen**, general foreman of precision rotary forging, said forging times can be reduced from up to six hours to as little as 15 minutes, depending on the

alloy, conditioning requirements and finished product. The machine is capable of forging several shapes on a single bar, giving the mill new flexibility in handling smaller orders or orders for unusual shapes and sizes.

For additional information on Armco stainless steel products,

Write 15 on Reader Service Card



**EASY DOES IT**—More than 400 tons of steel formed into dozens of rooms is lifted carefully over the Estelle Maersk by four giant cranes at Bethlehem Steel Corporation's Sparrows Point (Md.) yard. The new, additional accommodations deckhouse was lifted from a pre-outfitting area on the ground to its permanent location just forward of the ship's existing house. Estelle Maersk, the first ship scheduled for completion in the U.S. Navy's Maritime Prepositioning Ship Program, will be floated out of the yard's 1,200-foot-long building basin. Construction will continue at pierside. Delivery is scheduled for August 31, 1984. Owned by a consortium of banks, the ship will be operated by affiliates of Maersk Line, Limited, of New York City and chartered to the Navy's Military Sealift Command. In addition to the construction of the accommodations deckhouse shown above, a major portion of the work has involved the construction of 157-foot-long midbody section, which lengthens the ship to 755 feet.

## SNAME Gulf Section Meets In Biloxi



Gulf Section SNAME, September 23-28 (from left): **Chester A. Hard III**, papers chairman; **Robert Woodruff** and **John F. Robbins II**, authors; and **Dr. John P. Hackett**, section vice chairman-East.

The Gulf Section of The Society of Naval Architects and Marine Engineers (SNAME) held its fall meeting at the Biloxi Hilton in Biloxi, Miss. Two informative and interesting papers were presented.

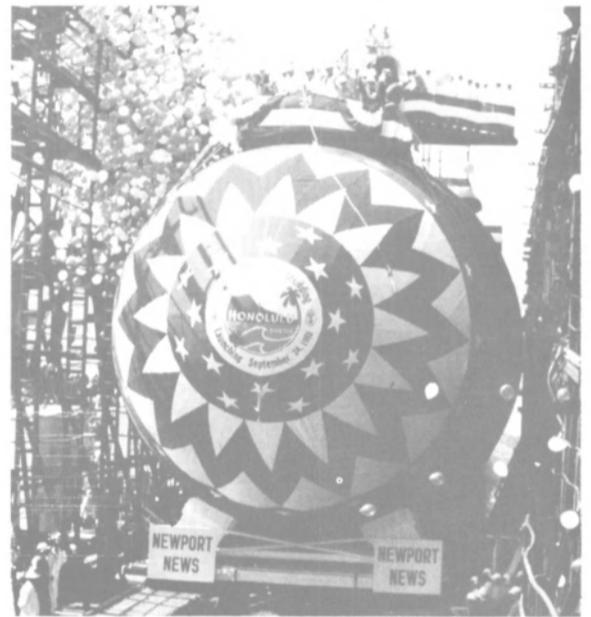
**John F. Robbins II** of Ingalls Shipbuilding presented a paper describing a "Destroyer Synthesis Computer Algorithm." This algorithm is an effective tool in establishing a baseline weight estimate during the feasibility or conceptual design process for a ship utilizing a destroyer hull form. Inputs for this

model include payload, performance and mission requirements, manning, and a description of vessel characteristics. Outputs include estimates of speed and power, electrical load requirements, fuel load, total volume, weights by weight group and vertical centers of gravity.

The development of submerged foil hydrofoils with emphasis on the "Boeing Offshore Jetfoil" was the topic of the second paper, which was delivered by **Robert Woodruff** of Boeing Marine Systems. Boeing hydrofoils, which have been under development for over 25 years, have three major systems that make them unique—fully submerged foils, water jet propulsion, and an automatic foil control system. With its high speed and superior sea-keeping ability, the jetfoil promises to find a sizable role in the support of the offshore oil industry. Boeing engineers are currently working to complete development of a personnel transfer device needed before the jetfoil can assume this role.

**Dr. John Hackett**, vice chairman-East, and **Chet Hard**, papers chairman, presented certificates of application to the authors for their papers.

## Submarine Honolulu Launched At Newport News Shipbuilding



The attack submarine Honolulu is launched at Newport News Shipbuilding.

National Security Advisor **William P. Clark** was the principal speaker at the launching of the attack submarine Honolulu at the Newport News Shipbuilding yard where the submarine was built. **Jean Clark**, wife of the National Security Advisor, was the ship's sponsor breaking the traditional bottle of champagne over the ship's bow.

The Honolulu is a Los Angeles-class submarine, 360 feet long, 33 feet abeam, displaces 6,900 tons submerged, has a draft of 32 feet, is powered by a steam turbine utilizing a pressurized water reactor, and accommodates 12 officers and 115 enlisted men. It is the 37th submarine launched by Newport News Shipbuilding since 1960.

**Edward J. Campbell**, president and chief executive officer of Newport News Shipbuilding, remarked, "Hawaii began a new era of growth and prosperity as our 49th state in 1959, the year Newport News Shipbuilding made a spectacular entrance into the nuclear age with the launchings of three United States nuclear Naval vessels: the Polaris submarine Robert E. Lee, the attack submarine Shark, and the first nuclear aircraft carrier Enterprise—a remarkable achievement by anyone's standards."



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Van der Horst Corp. of America, 314 Penn Ave., Olean, NY 14760

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## FILTERS

Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307

Wm. W. Nugent & Co., P.O. Box 948, Skokie, IL 60076

## FINANCING—Leasing

A.G. Becker Paribus Inc., 2 First National Plaza, Chicago, IL 60670

Yegen Marine, P.O. Box 25504, Ft. Lauderdale, FL 33320

## FIRE PROTECTION, DETECTION, & ALARM SYSTEMS

EEV, Inc., 7 Westchester Plaza, Elmsford, NY 10523

Walter Kidde, Walter Kidde Dr., Wake Forest, NC 27586

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

## FUEL OIL/ADDITIVES—Analysis & Combustion Testing

Ferrous Corporation, 910-108th N.E., P.O. Box 1764, Bellevue, WA 98009

Fuji Trading (America) Ltd., 17 Battery Place, New York, NY 10004

New York Mercantile Exchange, Four World Trade Center, New York, NY 10048

Rolfite Products Inc., 300 Brood Street, Stamford, CT 06901

## FURNITURE

Bailey Carpenter & Insulation Co., 74 Sullivan Street, Brooklyn, N.Y. 11231

Comfort-Mate, Inc., 7988 NW 56th Street, Miami, FL 33166

## GALLEY EQUIPMENT

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

Kiefer Corporation, W227 N546 Westmound Dr., Waukesha, WI 53186

## GANGWAYS

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

## HATCH & DECK COVERS—Chain Pipe

Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07027

Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696

MacGregor-Navire International, Box 8991, S-402 74 Goleborg, Sweden

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

Julius Mock & Sons, Inc., 20 Vesey Street, New York, NY 10007

J.E. Steigerwald Co., Inc., 5515 Belair Rd., Baltimore, MD 21206

## HEAT EXCHANGERS

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

American Standard Inc., Heat Transfer Div., Buffalo, NY 14240

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

## HULL CLEANING

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

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

Gulf International Divers, P.O. Box 1342, Gretna, LA 70052

Performance Hull Cleaning Systems, Inc., P.O. Box 655 New Orleans, LA 70059-0655

Phosmarin Equipment, 21, Boulevard de Paris, 13002 Marseille, France

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

Stork Services B.V., P.O. Box 2013, 7750 CA Hengelo, Holland

## HYDRAULICS

Aeroquip Corp., 1130 Maynard Road, Jackson, MI 49202

HRS, Inc., 3334 Victor Court, Santa Clara, CA 95050

Hydronautics, 6338 Lindmar Drive, Goleta, CA 93017

## INERT GAS—Generators—Systems

Foster Wheeler Boiler Corp., 110 So. Orange Ave., Livingston, N.J. 07039

Maritime Protection A/S, N. American Agents, American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906

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

## INSULATION—Cloth, Fiberglass

Bailey Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231

Superior Energies, Inc., P.O. Drawer 386, Groves, TX 77619

## INSURANCE

Adams & Porter, 1819 St. James Place, Houston, Texas 77027

Adams & Porter, 1 World Trade Center, Suite 8433, New York, N.Y. 10048

Assurance Foreningen Skuld, P.O. Box 1376 Vika, Stortingagaten 18, N-OSLO 1, Norway

R.A. Fulton & Company Insurance Services, 100 California St., San Francisco, CA 94111

Midland Insurance Co., 160 Water St., New York, N.Y. 10038

United States P&I Agency, Inc., 80 Maiden Lane, New York, NY 10038

## JOINER—Watertight Doors—Paneling

Bailey Distributors, Inc., 74 Sullivan St., Brooklyn, NY 11231

Isolamin Panels, c/o Consafe, Inc., P.O. Box 40339, Houston, TX 77040

Masonite Commercial Division, Dover, OH 44622

Megadoor Inc., 441 Lexington Ave., Suite 903, New York, NY 10017

Walz & Krenzer, Inc., 400 Trabold Road, Rochester, NY 14624

## KEEL COOLERS

R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858

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

## LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights

ACR Electronics, Inc., P.O. Box 2148, Hollywood, FL 33022

Browning Marine Inc., (Aqua Signal) 33W 480 Fabyan Parkway, Ste 105, West Chicago, IL 60185

Keuffel & Esser/Kratos, 20 Whippary Rd., Morristown, NJ 07960

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

Metriape 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  
James O. Nelson, 225 Argyle Rd., West Palm Beach, FL 33405  
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  
Schmahl and Schmahl, 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  
Timsco, 622 Azalea Road, Mobile, AL 36609  
Tracor Hydronautics, Inc., 7210 Pindell School Rd., Laurel, MD 20707  
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  
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., Buckwheat 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  
Electric Tachometer Corp., 68th & Upland Street, Philadelphia, PA 19142  
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  
ITT Mackay Marine, 2912 Wake Forest Road, Raleigh, N.C. 27611  
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 Vapenfabrik, 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, Tarrant, CA 90503  
Nav-Corn, Inc., 9 Brandywine Drive, Deer Park, NY 11729  
Navidyne Corp., 11824 Fishing Point Drive, Newport News, VA 23606  
Perko Inc. (Lights), P.O. Box 64000, Miami, FL 33164  
Racal-Decca Marine, Inc., 4200 23rd Avenue West, Seattle, WA 98199  
Radar Devices, Inc., 2955 Mercer 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  
Roberson Auto Pilot, 135 Fort Lee Road, Leonia, NJ 07605  
Selesmar S.p.A., Casella Postale 9, 50020 Montagnana Val Di Pesa,  
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 Ave-  
nue, 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  
Butlerworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX  
77223-9989  
Butlerworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX,  
England  
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ  
07647  
Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307  
From Industrial, P.O. Box 33210, Tulsa, OK 74135  
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  
Bywater Coatings, 1610 Engineers Road, Belle Chasse, LA 70037  
CLEMCO, P.O. Box 7680, San Francisco, CA 94120  
"CONSOL" manufactured by Contact Paint & Chemical Co. Inc., 200 S.  
Franklinton Rd., Baltimore, MD 21223  
Devoe 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  
Farboil, 8200 Fischer Road, Baltimore, MD 21222  
Grow Group, Inc., 200 Park Ave., New York, NY 10017  
Hempel Marine Paints, Inc., 65 Broadway, New York, NY 10006; P.O. Box  
41, So. Houston, TX 77587; P.O. Box 10265, New Orleans, LA 70181  
International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083  
Jotun-Baltimore Copper Paint Co., 840 Key Highway, Baltimore, MD 21230  
Magnus Maritec International Inc., 150 Roosevelt Pl., P.O. Box 150, Palis-  
ades 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**  
Camlock Flange Sales Corp., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696  
Hydro-Craft, Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063  
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  
Armco 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, Nor-  
folk, 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  
Goltin 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 Koppers Way, Chesapeake, VA 23323  
M.A.N.-B&W Diesel, 2, Ostervej, DK-4960 Haleby, Denmark  
MTU of North America, One E. Putnam Ave., Greenwich, CT 06830; 10450  
Corporate Dr., Sugarland, TX 77478; 2945 Railroad Ave., Morgan City,  
LA 70203; 180 Nickerson St., Seattle, WA 98109; 1730 Lynn St., Arlington,  
VA 22209  
MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046  
Mapeco Products, Inc., 20 Vesey St., New York, NY 10007  
Maritime Industries, Ltd., 6307 Laurel St., Burnaby, B.C. Canada V5B 3B3  
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507  
National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA  
70037  
Ornithruster 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, Murrero, 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  
FMC Corporation, Pump Division, 326 S. Dean Street, Englewood, NJ  
07631  
Industrial Products & Engineering Co., Inc., 1 Sawyer Dr., Coventry, RI  
02816  
Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101  
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238  
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, Col-  
ton, 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—Hawthers—Fibers**  
American Mfg. Co., Inc., Willow Avenue, Honesdale, Pa. 18431  
Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008  
DuPont Co., KEVLAR Aromatic 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**  
Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142  
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., 449 Sheridan Blvd., Inwood, L.I., N.Y.  
11696  
National Sanitation Foundation, P.O. Box 1468, Ann Arbor, MI 48105  
**SCAFFOLDING EQUIPMENT—Work Platforms**  
McCausey 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**  
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042  
Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004  
Tilne, 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 Maestranz 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., Bethlehem, PA 18016  
Blohm & Voss Company, 55 Morris Avenue, Springfield, NJ 07081  
Burmeister & Wain Skibsvaerft A/S, P.O. Box 2122, Refshaleoen-1015 Co-  
penhagen K-Denmark  
Burrard Yarrows 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 Navali Riuniti, Via Cipro, 11, 16100 Genova, Italy  
China Shipbuilding Corp., 3 Chung Kang Rd., Hsia Kang, Kaohsiung, Tai-  
wan, 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, 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, Singa-  
pore 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  
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  
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, Singa-  
pore 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., Se-  
attle, 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  
John Manly Shipyards, 2050 East Kent Ave., Vancouver, B.C. V5P 2T2,  
Canada  
Marystown Shipyard Limited, P.O. Box 262, Marystown, Newfoundland,  
Canada AOE 2M0  
Misener Industries, Inc., 5353 Tyson Avenue, P.O. Box 13625, Tampa, Fla.  
33681  
Mitsubishi Heavy Industries, Ltd., 5-1, Marunochi 2-chome, Chiyoda-ku, To-  
kyo, 100 Japan  
Monark Boat Co., P.O. Box 210, Monticello, Ark. 71655  
Moron 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., New-  
port 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  
Patti 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, Taepyeong-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,  
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Service Machine Group, Inc., P.O. Box 2664, Morgan City, LA 70381  
Southbay Boat Inc., P.O. Box 13308, San Diego, CA 92113  
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.  
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Valmet Oy, Helsinki Shipyard, Laivanrakentajantie 2, P.O. Box 910 SF-  
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West Coast Salvage And Contracting, 2150 East Kent Avenue, Vancouver,  
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Frank Jeffrey & Assoc., 5201 Westbank Exp., Suite 206, Marrero, LA 70073  
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## TANK CLEANING

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

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

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

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

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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

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

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

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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., 449 Sheridan Blvd., 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

Stackham 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

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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

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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

Timberland Equipment Ltd., Box 490, Woodstock, Ont. Canada N4S 7Z2

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

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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

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

## Wartsila Opens Newest Factory In Singapore

—Engine Literature Available

The newest diesel engine factory in Singapore, Wartsila Power Singapore (Pte) Ltd., has started production. Wartsila Power Singapore, is a joint venture comprising Wartsila of Finland and Keppel Shipyard of Singapore. The company manufactures and markets Wartsila Vasa 22HF heavy fuel diesel engines suitable for use in ships and power-generating plants. The company also markets the other Wartsila Diesel Engine types in the Asean countries, Australia and New Zealand.

The first four eight-cylinder Vasa 22HF engines have already been delivered to the customer, Gul Engineering of Singapore, for use as the main engines in two tugboats. All the machining units are numerically controlled. The factory also has modern assembly and test-run centers using equipment that can accept heavy fuel with high viscosity values.

The Vasa 22HF is reportedly the smallest heavy fuel diesel engine in the world. It has an output range of 440-2560 kw (600-3,480 hp) at 900-1,200 rpm. It can be used as main or auxiliary engine in various ship types: as the main engine in workboats, supply vessels and other coastal vessels, and as an auxiliary engine in all types of vessels using heavy fuel to produce electricity.

For a free color brochure giving the technical characteristics of the 22HF engine,

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## Wallenius Lines Orders Four Large Car And Truck Carriers



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Wallenius Lines recently signed Letters of Intent for four large car and truck carriers. Two of them will be built by Hitachi in Japan and two by Kockums in Sweden for delivery in 1985. The order, which is worth around US \$150 million is the largest ever placed by Wallenius.

The new ships will be identical in appearance to the four vessels previously received from Kockums, but the deck and ramp arrangements will be improved and the latest type of fuel-saving main engine installed.

The vessels, which will partly replace older units, match the increasingly marked demands of car manufacturers for flexible vessels that can carry not only passenger cars but also commercial vehicles, such as vans, trucks, chassis, buses, agricultural and roadworking equipment.

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James O. Nelson, 225 Argyle Rd., West Palm Beach, FL 33405  
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  
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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  
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Schmohl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Florida  
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Hill, NJ 08003 (Publications Division at Cherry Hill location)  
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Simmons Associates, P.O. Box 760, Sarasota, FL 33578  
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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.,  
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Harris Communications (RF Communications), 1680 University Avenue,  
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ITT Mackay Marine, 2912 Wake Forest Road, Raleigh, N.C. 27611  
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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,  
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Caterpillar Engine Division, 100 N.E. Adams, Peoria, IL 61629  
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Beloit, WI 53511  
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Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231  
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Krupp Mak Diesels, Inc., 4329-33 Di Paolo Center, Glenview, IL 60025  
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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 Taravello 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)

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FMC Corporation, Pump Division, 326 S. Dean Street, Englewood, NJ  
07631  
Industrial Products & Engineering Co., Inc., 1 Sawyer Dr., Coventry, RI  
02816  
Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101  
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238  
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, Col-  
ton, CA 92324

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Port Refrigeration Div., 157 Perry St., New York, NY 10014

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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

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Hy-Drive America Corp., 3629 Vernon Blvd., Long Island City, NY 11106  
Marine Drive Systems, 519 Raritan Center, Edison, NJ 08817  
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11696  
National Sanitation Foundation, P.O. Box 1468, Ann Arbor, MI 48105

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

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Atlantic Dry Dock, P.O. Box 276, Ft. George Island, Jacksonville, FL 32226  
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BFC Marine Services, Inc., 25 Fifth St., Brooklyn, NY 11231  
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Norcontrol, 135 Fort Lee Rd., Leonia, NJ 07605

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# "DARN RIGHT DILBURN'S GOOD, I TRAINED HIM."



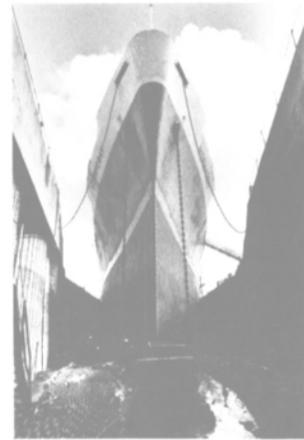
The man with the cigar is Dilburn "Junior" Herrington. He's been with us over 30 years, and is now foreman of our Fabrication shop. The man who trained him is Jack Groover, who recently retired. Jack was foreman of Fabrication. He was with us since the end of World War II.

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