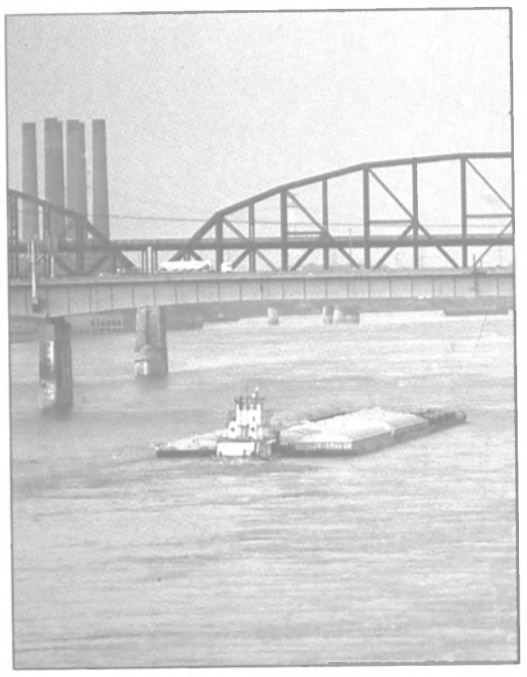
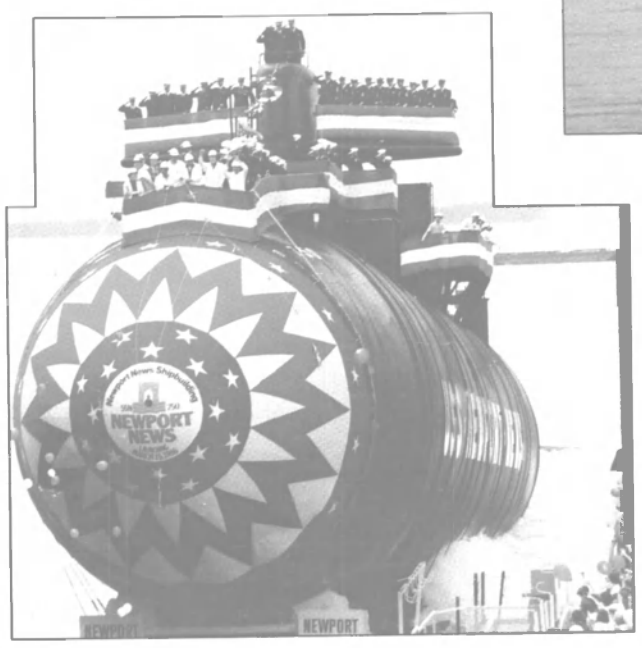
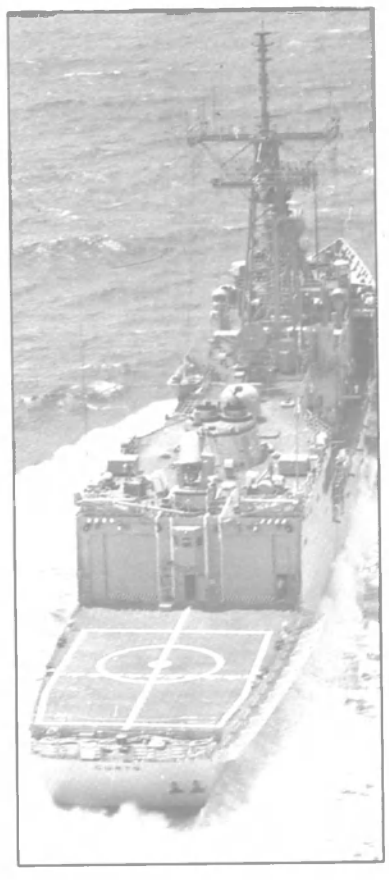
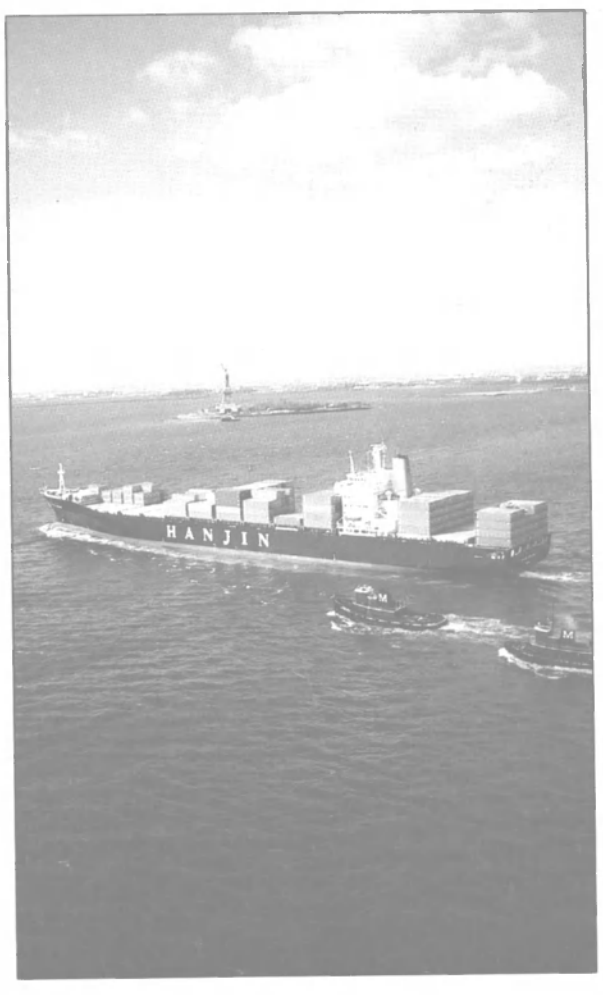
MARITIME REPORTER
AND ENGINEERING NEWS









1986 YEARBOOK

JUNE 1986 ISSUE

One word describes Nichols' Whidbey Island Catamarans:

CLASS!

NICHOLS BROS. BOAT BUILDERS

Nichols Brothers Boat Builders, Inc.
P. O. Box 580
5400 S. Cameron Road
Freeland, WA 98249

For more information about these striking, commodious, fast passenger vessels, with their attractively low seat mile costs, call Matt Nichols (206-321-5500) or George Duclos (617-676-8596).

GLADDING-HEARN
SHIPBUILDING
The Duclos Corporation

Gladding-Hearn Shipbuilding
P. O. Box 300-W
One Riverside Avenue
Somerset, MA 02726

Circle 254 on Reader Service Card

ON THE COVER

Photos: Clockwise from logo: **Birka Princess** built by Valmet's Helsinki yard; photo courtesy American Waterways Operators; **USS Curtis; Lawrence H. Gianelli** built by Tampa Shipyards; **New York harbor**—courtesy Moran Towing, F.J. Duffy; **Glacier Express** on sea trials in Puget Sound—Bill Houlton, Camera Craft; (center) launching of the submarine **Newport News** at Newport News Shipyard.

$1.8-Million Contract To Great Lakes Dredging

A $1,784,750 contract for maintenance dredging in Barataria Bay Waterway was awarded to the Great Lakes Dredge & Dock Company of New Orleans according to Colonel **Eugene S. Witherspoon,** District Engineer.

The fixed-price contract consists of the removal and satisfactory disposal of approximately 1,835,000 cubic yards of shoal material from a 14.7-mile stretch of the waterway located in Jefferson Parish, La.

Dredging begins about 15 miles below Lafitte and extends southward to the vicinity of Grand Isle. The dredging is to restore and help maintain the 12-foot deep navigation channel authorized by Congress.

Harty Appointed Manager Of U.S. Navigation's Inward Service Department

Frank M. Cangemi, president of U.S. Navigation, Inc., has announced the appointment of **Francis (Frank) J. Harty** as manager of U.S. Navigation's Inward Service Department.

He will be responsible for all inward activities on behalf of U.S. Navigation's principals, The National Shipping Company of Saudi Arabia, Scindia Steam Navigation, America-Africa Line, Breakbulk Container Line and Maragua Line.

Mr. **Harty** was previously with Columbus Line and ELMA, handling their inward activities, and brings to U.S. Navigation his expertise in handling inbound cargo movements.

MARITIME REPORTER AND ENGINEERING NEWS

118 EAST 25th STREET
NEW YORK, N.Y. 10010
(212) 477-6700
Telex: MARINTI 424768
ESTABLISHED 1939

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

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

Member BPA
Business Publications Audit of Circulation, Inc.

ISSN-0025-3448
No. 7 Volume 48

ALL MATERIAL FOR EDITORIAL CONSIDERATION SHOULD BE ADDRESSED TO ROBERT WARE, EDITOR

Zapata Gulf Acquires All Assets Of Seahorse

Zapata Gulf Marine Corporation of Houston has completed the acquisition of the assets of Seahorse, Inc., including 92 marine service vessels, according to an announcement by **Kenneth W. Waldorf,** Zapata Gulf chairman and chief executive officer.

In exchange for the Seahorse assets, Seahorse's parent company, Petroland Incorporated, a subsidiary of Texas Eastern Corporation, will receive Zapata Gulf stock equal to an 18.5 percent equity interest in the company. Petroland will also receive two seats on the Zapata Gulf board of directors, which will be expanded from six to eight members. Other holders of Zapata Gulf stock include: Zapata Corporation, 34.7 percent; HNG/InterNorth, 29.3 percent; and Halliburton, 17.5 percent. Under terms of the acquisition agreement, Zapata Gulf does not assume any additional debt obligations.

The addition of the Seahorse vessels brings to 423 the number of vessels owned and operated by Zapata Gulf, a company formed in November 1984 through the merger of Zapata Marine, HNG/InterNorth's Gulf Fleet Marine, and Halliburton's Jackson Marine.

Rody Selects AWSC Committee Chairmen

Walter W. Rody, chairman of the American Waterways Shipyard Conference (AWSC), and president of Port Allen Marine Service, Inc., has announced the following to serve as AWSC committee chairmen in 1986:

Committee of Counsel—**William P. Morelli,** Associate General Counsel and Director of Government Affairs, Midland Enterprises; Economic and Commercial Committee—**Robert E. Kenny,** president, HBC Barge, Inc.; Industrial Relations Committee—**Leo Toupin,** vice president, Industrial Relations, Jeffboat Incorporated, Membership and Public Relations Committee **George Fegert,** president, Gretna Machine & Iron Works, Inc.; and Vessel Repair Committee—**Neal S. Platzer,** president, Platzer Shipyard, Inc.

In a letter to the AWSC membership reporting on the new AWSC committee chairmen, Mr. **Rody** urged all members to participate actively in committees that develop the policies and programs that are necessary for the future of the small and medium-sized shipyards.

Danos & Curole Continue Long-Range Expansion In Marine Department

Construction is underway on a $1.9-million class 130 jackup barge for Danos & Curole Marine Contractors of Larose, La., as part of the ongoing process of expansion in their marine department.

Featuring a state-of-the-art closed loop hydraulic system, the vessel, to be christened Eric Danos, will be capable of working in depths of up to 90 feet and has an overall length of 94 feet, a beam of 63 feet and a draft design of 6 feet 6 inches.

Engines on the Eric Danos will be two 12V-71-N Detroit diesels and deck space will allow for 150,000 pounds of topside cargo. As additional support, hydraulic cranes with 40-ton and 10-ton capacities and 70-foot and 50-foot boom lengths, respectively, will be included.

Designed with a variety of services in mind, the Danos & Curole jackup boats have gained special notoriety for their use in pipelaying projects.

The firm is also known in the oil and marine industries as a full service contractor for more than 40 years.

Danos & Curole locations can be found throughout the Gulf Coast in Larose, Morgan City, Buras, Intracoastal City, and Cameron, La., and Galveston, Texas.

For further information,

Circle 63 on Reader Service Card

Contract With $25-Million Potential Awarded Rockwell —Brochure Available

A production contract with options for four years to produce fixed-station radio transmitters for the U.S. Navy has been awarded to Rockwell International Corporation's Collins Defense Communications, Cedar Rapids, Iowa.

The contract, issued by the U.S. Navy's Space and Naval Warfare System Command in Washington, D.C., is for production of up to 470 10 kilowatt high-frequency transmitters known as the AN/FRT. The $450,000 initial contract has a potential value of more than $25 million if each of the four production options is exercised.

The AN/FRT is a high-performance HF communications transmitter that features automatic tuning, built-in test capability and synthesized frequency control in the 2.0 to 29.999 MHz spectrum. The AN/FRT is a derivative of the HF-80 family of HF communications equipment which incudes 1kw, 3kw and 10kw transmitters and accessories.

For further information and a free brochure,

Circle 62 on Reader Service Card

Garrow Appointed Public Relations Vice President At Newport News Shipbuilding

Newport News Shipbuilding in Virginia, a subsidiary of Tenneco Inc., has named Rear Adm. **Jack A. Garrow,** USN (Ret.), to the position of vice president-public relations. He retired from the Navy at the end of April this year as chief of information.

Admiral **Garrow** served as the principal public affairs advisor to the Secretary of the Navy and the Chief of Naval Operations. His responsibilities also included management of the Navy's worldwide public affairs program.

$3.1-Million Navy Contract To Braswell Shipyards For USS Los Alamos Work

Braswell Shipyards Incorporated, Mt. Pleasant, S.C., is being awarded a $3,075,912 firm-fixed-price contract for the restricted availability of the USS Los Alamos (AFDB-7). Work will be performed in Holy Loch, Scotland, and is expected to be completed August 12, 1986. Four bids were solicited and three offers were received. The Supervisor of Shipbuilding, Conversion and Repair, Charleston, S.C., is the contracting activity (N00024-85-H-8139).

Nelson Electric Names Sanchez Sales Manager

Nelson Electric of Tulsa, Okla., has recently named **Vic Sanchez** as sales manager for Enclosure and Control Products. In this position, he will be responsible for providing headquarters support and direction to field sales representatives nationwide.

Mr. **Sanchez** was previously with Adalet for 10 years where he served as the national sales manager and before that as regional sales manager. He also has experience with Pyle-National, Appleton and Crouse-Hinds. Mr. **Sanchez** has been associated with the electrical industry for more than 25 years.

Nelson Electric Enclosure and Control Products are used worldwide, primarily in classified areas of petroleum, petrochemical and industrial plants. They include motor starters, junction boxes, circuit breakers, control stations, panelboards, instrument enclosures, low voltage bus boxes and switchracks.

For free literature on Nelson Electric Enclosure and Control Products,

Circle 89 on Reader Service Card

Bailey Refrigeration Goes On Site For Work Aboard Navy Aircraft Carrier

Bailey Refrigeration Company recently completed a top-to-bottom cleaning and charging of the U.S. Navy aircraft carrier Theodore Roosevelt's after ship's stores refrigeration system. The 81,600-ton carrier is currently nearing completion at Newport News Shipbuilding in Virginia.

The tune-up included purging all lines to remove air and moisture, charging the system with refrigerant, and testing for competency. Bailey's 12-man crew completed the complex task in three weeks, meeting the Navy's and the yard's need for a tight completion schedule.

Once awarded the job, Bailey required less than 24 hours to assemble a team of highly qualified technicians and service engineers and deliver necessary equipment to the job site.

Other current military assignments for the company include work on the USS Nimitz, a sister ship of the Roosevelt, and other Navy and Army craft. Bailey represents most major refrigeration and air conditioning manufacturers, and services all makes and models. Custom design of refrigeration and air conditioning is another company specialty.

For free technical literature describing Bailey's full range of services and equipment,

Circle 90 on Reader Service Card

NAVSEA Awards AT&T $9.7-Million Modification For Sonar Equipment

AT&T Technologies Incorporated, Federal Systems Divisions, Greensboro, N.C., is being awarded a $9,672,500 modification to a previously awarded fixed-price-incentive contract for AN/BQR-15 special project 9080 sonar equipment for Poseidon and Trident submarines. Work will be performed in Burlington, N.C., and is expected to be completed in June 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-6154).

Navy Awards $73.7-Million Crane Contract To Craft Machine —Literature Available

The Northern Division of the Naval Facilities Engineering Command (NAVFAC), headquartered at the Philadelphia Naval Shipyard, has awarded a $73.7-million contract for the multi-year procurement of 23 portal cranes to Craft Machine Works, Inc., a small business firm in Hampton, Va.

The contract is the largest small business set-aside ever awarded by NAVFAC's Northern Division and the largest ever made following a successful appeal by SBA to the Secretary of the Navy.

The precedent-setting award was the direct result of action by SBA's Procurement Center Representative **Joseph E. May**, who at the time was stationed at the Philadelphia Naval Shipyard. Mr. **May** has since been named Chief of Prime Contracts, Philadelphia Regional office.

Craft Machine Works, Inc., was chosen from 18 firms that submitted technical proposals and 13 companies selected for actual bidding on the firm, fixed-price production contract which includes fabrication and installation.

Eighteen of the 60-ton cranes will go to the Norfolk Naval Shipyard in Portsmouth, Va., three to the Philadelphia Naval Shipyard, one to the Naval Submarine Base at King's Bay, Ga., and one to the Polaris Atlantic Missile Facility, Charleston, S.C. The cranes will be delivered over a five-year period.

The cranes are of the rail-mounted, self-powered portal type. They will revolve on a rotating bearing. Capacity will be 60 tons at a 90-foot radius. All but one of the cranes will replace existing equipment.

For full information and free detailed literature on Craft Machine products,

Circle 87 on Reader Service Card

Alsthom Awarded Contract To Build Two Dredges For Mexican Authority

Chantiers de l'Atlantique, the shipbuilding division of Alsthom-Atlantique in France, recently announced receipt of an order for two 4,000-cubic-meter dredges for the Mexican Dredging Authority. The contract follows the signing of a protocol in Mexico City in December of last year. The dredges are scheduled for delivery at the end of 1987 and the beginning of 1988.

The l'Atlantique shipyard in St. Nazaire is currently building what will be the world's largest cruise liner, the 70,000-gt Sovereign of the Seas, under construction for Royal Caribbean Cruise Line.

For information on the St. Nazaire yard's capabilities and facilities,

Circle 24 on Reader Service Card

ABS Elects New Members To Board Of Managers

Six maritime executives were elected to the board of managers of the American Bureau of Shipping (ABS) for three-year terms at the recent annual meeting of the international classification society held at the new world headquarters in Paramus, N.J.

Management of ABS is vested in its board of managers, whose responsibilities include the election and confirmation of people for service on ABS management, finance, audit, and classification committees, as well as on the technical committee.

The newly elected managers are: **Edward J. Campbell,** president and chief executive officer, Newport News Shipbuilding; **Joji Hayashi,** executive vice president and chief operating officer, American President Lines; Vice Adm. **William H. Rowden,** USN, Commander, Naval Sea Systems Command; **George H. Walls,** director, United Fruit Company; **Douglas C. Wolcott,** president, Chevron Shipping Company; and **George S. Zacharkow,** chairman, Marine Office of America Corporation.

Metropolitan Expands Shop Capacity And Inventory

Metropolitan Master Machinists, manufacturing division of Metropolitan Plumbing Supply Corporation, has doubled their shop capacity and tripled their inventory of marine and shipbuilding and repairing valves, fittings, strainers, flanges and expansion joints up to 60 inches.

Available in stock in cast steel, iron, bronze, aluminum, ductile, forged steel, stainless and monel, the company offers a wide inventory of manifolds, cross valves, hose valves, check valves, gate valves, globe valves and angle valves.

For further information and literature on the full line of products offered by Metropolitan Plumbing,

Circle 33 on Reader Service Card

ASNE Symposium-1986 Set For October 2-4 In Biloxi, Miss.

The American Society of Naval Engineers (ASNE) and the Supervisor of Shipbuilding, Pascagoula, Miss., are sponsoring a symposium in Biloxi, Miss., October 2 through October 4, 1986. The symposium is titled "Destroyer, Cruiser & Frigate Technology."

The symposium is planned to bring the Navy and industry together for an interchange of technical ideas for future ship designs. It is intended that the invited technical papers will provide a survey of the current technology in the topic field. It is not intended to be too futuristic, neither is it intended to be what is going on today. Perhaps one way to think of it would be technology for the next major class to be designed within this century.

The symposium is scheduled to begin on Thursday, October 2, 1986, at the Mississippi Gulf Coast Coliseum. The nearly Hilton Hotel has set aside a large block of rooms for attendees with bus transportation to be provided to the coliseum.

There will be exhibits in the coliseum with 125 spaces available. All papers will be presented at the coliseum except for classified sessions that will be held at Keesler Air Force Base.

The invited papers will emphasize subsystem technology in the areas of weapons, command and control, aircraft installation, machinery, hydrodynamics, structures, survivability and detectability. Additional papers are planned on foreign technology, technology needs and technology assessment. Moderators for the session have been selected from distinguished leaders in the topics being presented.

There will be luncheons on both Thursday and Friday and a banquet on Thursday evening, all with guest speakers. On Saturday, October 4, a shipyard tour of Ingalls Shipbuilding will be conducted for those interested. Also, local interest tours will be available for spouses on both Thursday and Friday.

A registration package will be mailed to all ASNE members in July 1986. For further information, contact any of the following committee members: Symposium Chairman, **N. Kim Shanahan,** (601) 935-1420; Exhibit Committee Chairman, **Ron Wood,** (601) 935-3930; Papers Committee Chairman, Dr. **D.A. Rains,** (601) 762-7384; and Registration Committee Chairman, **Jack Youngworth,** (601) 935-3441.

Brinson Named Director Of Port Of New Orleans

Ron Brinson

J. Ron Brinson, former president of the American Association of Port Authorities, has been appointed director of the Port of New Orleans, according to **Charles S. Teamer Sr.,** president of the board of commissioners of the Port of New Orleans.

Mr. **Brinson** has been chief staff officer of the AAPA since 1979. In recent years this agency has been recognized as the voice of the U.S. port industry. Under his leadership, extensive education and training programs for port professionals have been developed into a highly praised AAPA activity.

A native of Charleston, S.C., Mr. **Brinson** was with the South Carolina Port Authority for five years, and also was an aide to former South Carolina Governor **James B. Edwards.**

Rauma-Repola Offers Brochure On Unique RO-Pass Ship Concept

Rauma-Repola shipyard in Finland has just published a full-color, 8-page brochure describing its RO-Pass vessel design, which includes a series of vessels that carry both passengers and cargo. The design is basically a roll-on/roll-off ship with provisions for varied passenger and vehicle capacities to suit the needs of different functions and routes.

The brochure contains a cutaway drawing of a RO-Pass vessel, and outboard profiles of the design in various concepts. It also has color renderings of some of the passenger facilities.

A RO-Pass ferry would incorporate a wide stern ramp, fixed interior ramps port and starboard to the upper deck and at the centerline to the lower hold, stacks located exterior to the vessel's hull, and obstruction-free cargo areas without pillars.

For a free copy of the RO-Pass brochure,

Circle 25 on Reader Service Card

Ulstein Delivers Two Tug/Supply Vessels To Norwegian Owners

Ulstein Hatloe A/S in Ulsteinvik, Norway, recently completed two identical tug/supply standby and service vessels for Norwegian owners. The Gullbas (photo) was delivered to Saevik Supply Management of Fosnavaag, and the Troms Skarven to Troms Fylkes Dempskibsselskap of Tromsoe. The two vessels, first of the new UT 716 design, will be operating on a five-year charter to Statoil, the state-owned oil company, in the Gullfaks Field.

The vessels have an overall length of 261.5 feet, beam of 59 feet, and depth to main deck of 27.9 feet. Deadweight at maxiumum draft of 19.5 feet is 2,690 tons. Built to Det norske Veritas classification, the vessels also meet the rules and regulations of the Norwegian Ship Control for worldwide trading, SOLAS 1978, International Convention on Load Lines 1969, and Marpol 1973.

Propulsion is provided by twin KVMB-16 Bergen Diesel engines, each with an output of 3,942 bhp at 825 rpm, driving Ulstein controllable-pitch propellers via Lohmann & Stolterfoht reduction gears. Ulstein also supplied a 1,200-hp bow thruster, 1,000-hp gyro thruster, and two 1,000-hp stern thrusters. Electrical power is supplied by Bergen/Siemens generator sets. Maximum speed is 15.5 knots, but the vessels will normally be operated at the economic speed of 11-12 knots.

The fire-fighting plant supplied by Thune Eureka consists of three water monitors, each with a capacity of 2,400 cubic meters per hour, a throw length of 160 meters at 60 degrees, and a throw height of 120 meters at 60 degrees. There are also two foam monitors on each vessel.

For additional information on the Ulstein shipyard.

Circle 48 on Reader Service Card

GULLBAS/TROMS SKARVEN
Major Suppliers

Main engines (2)	Bergen
Reduction gears	Lohmann & Stolterfoht
Propellers	Ulstein
Bow thruster, gyro thruster, & stern thrusters	Ulstein
Anchor-handling/ towing winch	Hydraulik Brattvaag
Firefighting plant	Thune Eureka
Gensets	Bergen/Siemens
Stabilizing system	Ulstein
Bulk-handling system	Ulstein
Rescue boats	Harding & Seabear

Port Of Galveston Plans Waterfront Development For Cargo And Tourism

The Port of Galveston, Texas, is offering for private redevelopment a deepwater dock area of some 20 acres that was once used for unloading bananas. The Port hopes that the unusual plan will serve the dual benefit of improving the dock and expanding a nearby tourist area known as the Strand.

Within walking distance of the piers being offered, the Strand district includes buildings that have been restored to their 19th century grandeur, now housing restaurants, galleries, and other shops. Visitors can also tour the restored 1877 tall ship Elissa and the new paddlewheel replica Colonel, both of which are docked nearby.

The Galveston proposal states that the property is offered "as is" with costs of site preparation, removal of existing structures, or other modifications the responsibility of the developer.

For further information on the Port of Galveston,

Circle 94 on Reader Service Card

ConDiesel Mobile Receives $12.2-Million Contract

ConDiesel Mobile Equipment, Waterbury, Conn., is being awarded a $12,227,684 firm-fixed-price contract to furnish 189 shipboard aircraft spotting dolly units, 26 support equipment quick engine change assemblies, integrated logistics support and attendant technical data. Work will be performed in Salisbury, Md. (90 percent), and Waterbury (10 percent), and is expected to be completed in May 1989. One hundred four firms were solicited and 14 offers were received. The Naval Regional Contracting Center, Philadelphia, Pa., is the contracting activity (N00140-86-C-9421).

Derecktor Delivers First Of Two Ferries To New York City

The Robert E. Derecktor of Rhode Island shipyard recently delivered the Alice Austen (photo), first of two passenger ferries ordered by the City of New York's Department of Transportation, Bureau of Ferry & General Aviation Operations.

The $3.8-million, double-ended vessel has been designed and constructed for year-round operation in New York Harbor. Her primary use will be for off-peak passenger travel between Manhattan and Staten Island. The vessel will also be put to use during the forthcoming July 4 weekend Statue of Liberty celebration.

The ferry is named for **Alice Austen,** a famous Staten Island photographer. The Alice Austen Society, based in New York City, held a commissioning ceremony aboard the vessel shortly after her delivery to New York Department of Transportation officials.

The 207-foot all-steel vessel has a beam of 40 feet, depth to sun deck of 33 feet, and draft of 8 feet. She will accommodate a maximum passenger load of 1,280 people on two decks, with fixed fiberglass bucket seats for 930 passengers.

The propulsion/steering system supplied by Voith-Schneider is driven via hydraulic clutch and flexible coupling by a Caterpillar 3516 TA diesel engine rated 1,410 bhp at 1,600 rpm. The Voith-Schneider system provides extremely accurate maneuvering. The vessel is capable of being operated with an unmanned engine room due to the incorporation of a machinery monitoring system supplied by Engine Efficiency Associates.

Painted with International coatings in the New York DoT orange and grey color scheme, the ferry can load passengers on either deck. As the vessel is a double-ender, she does not have the conventional bow and stern configuration. Instead, she has been designated as having a "Manhattan End" and a "Staten Island End."

Pilothouses located at each end of the top deck provide maximum visibility, and house the Voith-Schneider propulsion and steering controls, the engine monitoring system, Racal-Decca RM1070 radars, and a Raytheon Ray 78 VHF radiotelephone.

A small concession stand is located on the upper deck. Interior finishes have been designed to be as vandal-proof and graffitti-resistant as possible.

The Derecktor yard expects to deliver the second ferry in late June, also in time for the Fourth of July festival.

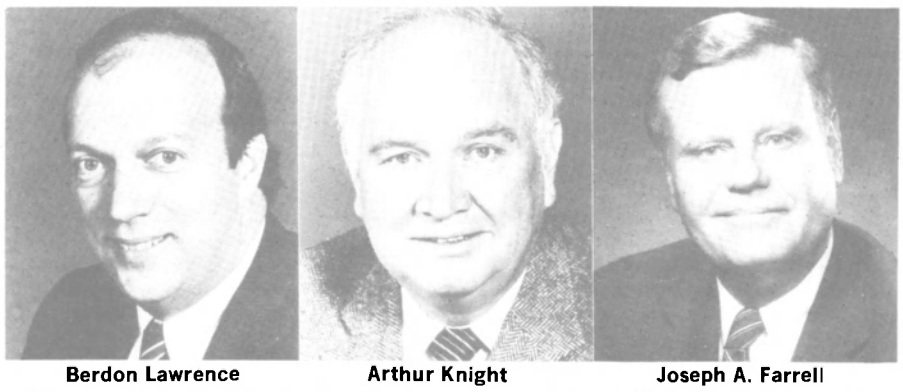
For further information on the Derecktor shipyard's facilities and capabilites,

Circle 51 on Reader Service Card

ALICE AUSTEN
Major Suppliers

Main engine	Caterpillar
Propulsion/steering system	Voith-Schneider
Shafting	LTV
Bearings/couplings	Cooper/Sier-Bath
Generator	Caterpillar
Emergency generator	White/Marathon
Engine monitoring system	Engine Efficiency
Bulkhead stuffing	Johnson Rubber
Silencers	Riley-Beaird
Keel coolers	Fernstrum
Radars	Racal-Decca
VHF Radiotelephone	Raytheon
Air horn	Kahlenberg
Compasses	Ritchie
Seating	American
Windows	Kearfott
Marine sanitation system	FAST
Sewage macerator	Haigh
Paint	International
Insulation	Claremont
Co_2 firefighting system	Hiller
Lines & offsets	Cali

AWO Elects Officers For 1986 At Annual Convention In Washington



Berdon Lawrence | Arthur Knight | Joseph A. Farrell

During the recent annual convention of The American Waterways Operators, Inc. (AWO), in Washington, D.C., **Berdon Lawrence** was elected unanimously as chairman of the board for 1986. Mr. **Lawrence,** president of Hollywood Marine, Inc., Houston, Texas, served as AWO vice chairman last year.

Mr. **Lawrence** completed his graduate and undergraduate work at Tulane University in New Orleans. He is a past director of the Houston Port Bureau, past chairman of the AWO Tank Barge Conference, and past chairman of the AWO Southern Region. He has been involved in the barge and towing industry for 18 years. As AWO chairman of the board, Mr. **Lawrence** succeeds **James H. Sanborn,** vice president-operations, Sonat Marine, Inc., Philadelphia, Pa.

Capt. **Arthur M. Knight** was elected to serve as vice chairman. Captain **Knight** is executive director of Reinauer Transportation Cos., Inc. and Boston Fuel Transportation, Inc. He is a graduate of the Harvard Graduate School of Business Administration Advanced Management Program, and was recently awarded an honorary doctorate degree by the Massachusetts Maritime Academy. Captain **Knight** is a past president of the Boston Marine Society, past president of the Port of Boston, past chairman of the AWO Atlantic Region and Vessel Operations Committee, and is a member of the Towing Safety Advisory Committee.

Joseph Farrell was reelected as president of AWO. Mr. **Farrell** is a graduate of the U.S. Naval Academy, and spent 12 years as an officer in the U.S. Navy, primarily in nuclear submarines. He served in Washington, D.C., as Chief of Staff to Senator **Charles Percy,** and immediately prior to assuming the presidency of AWO, was senior vice president of Pullman Power Products of Pennsylvania.

Lee Hill, AWO controller, was reelected as treasurer, and **Georgia Volakis,** AWO assistant to the president, was reelected as secretary of the association.

Pentagon Approves $216-Million Sale To Portugese Navy

The Pentagon recently approved the sale of some $216-million worth of naval weapons to the Portugese Navy. According to the Pentagon, the equipment and services in the sale will be used in the Portugese Navy's new frigate construction program.

If there are no Congressional objections, Portugal will be offered 24 Harpoon and 24 Seasparrow missiles; three Phalanx guns to protect against cruise missile attacks; 72 MK-46 torpedoes and torpedo-launching systems; six advanced gas-turbine engines; associated communications gear; and spare parts.

The sale, which will be overseen by the U.S. Navy, involves the following prime contractors: Aerojet General, General Dynamics, General Electric, McDonnell Douglas, Raytheon and the Naval Ordnance Station in Louisville, Ky.

Sophisticated Catcher/Processor Delivered By Halter Marine

Jack Edwards, president of Halter Marine, Inc., a Trinity Industries company headquartered in New Orleans, has announced the delivery of the catcher/processor fishing boat Atlantic Prince (photo), built at its Moss Point, Miss., shipyard for Lund Fisheries. **Warren Lund** is the principal partner of the group that owns and operates the new vessel.

The Atlantic Prince has been completely outfitted with state-of-the-art fish-processing equipment. The vessel is capable of processing and freezing 275 metric tons of boxed fish, and can stay at sea for 21 days. She will have an operating crew of four, and as many as 22 packers, depending upon the particular catch the vessel is fishing.

Propulsion is provided by twin Caterpillar 3512 diesel engines with a total output of 1,800 bhp. The two Caterpillar 3412 gensets are each rated 460 kw. The vessel is equipped with a MARCO T-200 box thruster.

Richard Taubler, naval architect of Dover, Del., designed the Atlantic Prince, and Halter Marine produced the detail working drawings.

Navigation and communications equipment includes two Furuno radars, Furuno weather facsimile, Robertson automatic pilot, Northstar Loran C, Datamarine and Skipper depth sounders, and Cybernet, Motorola, and Sailor radiotelephones.

For more information on Halter Marine's facilities and capabilities,

Circle 46 on Reader Service Card

ATLANTIC PRINCE
Major Suppliers

Main engines (2)	Caterpillar
Engine controls	Wabco
Bow thruster	MARCO
Clutches	Caterpillar
Gensets (2)	Caterpillar
Steering system	Wagner
Stuffing boxes	Johnson
Generator control panels	Continental
Shaft and stern bearings	BFGoodrich
Propellers	Coolidge
FW pressure and sanitary systems	Myers
Pumps	Marlow & Roper
Trawl winch, net reel, anchor windlass	MARCO
Radars (2)	Furuno
Radiotelephones	Cybernet, Motorola & Sailor
Automatic pilot	Robertson
Weather facsimile	Furuno
Loran	Northstar
Depth sounders	Datamarine & Skipper
Freezer system	Sabroe
Running & navigation lights	Aqua Signal
Searchlight	Perko
Lifesaving gear	RFD-Elliot
Air horn	Kahlenberg
EPIRBS	ARC Electronica

New Edition Of NDT Rules Available From ABS

The American Bureau of Shipping has announced the availability of its 1986 edition of "Rules for Nondestructive Inspection of Hull Welds (NDT Rules)." Superceding the previous 1975 edition, the new volume contains two added sections and several new appendices providing more information and guidelines on the application of these rules, thus further insuring that the soundness of welds on ship hulls and other marine structures is according to ABS requirements.

Orders for the new edition may be placed with the Book Order Section, American Bureau of Shipping, P.O. Box 910, Paramus, N.J. 07653; price is $23.

ODECO Wins 1986 NOIA Safety In Seas Award

Ocean Drilling and Exploration Company (ODECO) has received the 1986 NOIA Safety in Seas Award for its Advanced Stability and Ballast Control Facility. The announcement was made by **W. Herbert Hunt,** National Ocean Industries Association (NOIA) chairman, and managing partner of Penrod Drilling Company.

ODECO president **Hugh J. Kelly** accepted the NOIA safety award, sponsored by Compass Publications, during NOIA's 14th Annual Meeting in Washington, D.C., in April.

The ODECO Advanced Stability and Ballast Control Facility, located at its corporate headquarters in New Orleans, employs a computer-driven tilt-deck simulator to teach and demonstrate the principles of Mobile Offshore Drilling Unit (MODU) stability, and to teach and test offshore personnel in damage control and emergency procedures. Since ODECO's training program began in 1984, a total of 135 masters, barge engineers, control room operators, and others have completed the program. ODECO also is the principal sponsor of a ballast control simulator to be used by the Aberdeen Technical College in Scotland in providing rig stability training for offshore personnel working for all of the companies operating in the North Sea.

"The Safety in Seas Award underscores the commitment of the ocean industries to make the offshore workplace as safe as we possibly can," Mr **Hunt** said. "With its state-of-the-art ballast control simulator and the attendant training program, ODECO has shown us one more way to reach our common safety goal."

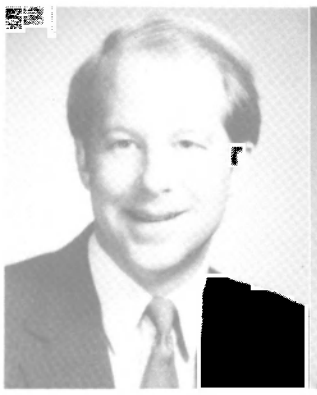
ODECO was unanimously selected from 18 nominations. Entries were evaluated on four criteria: Innovativeness, significant safety achievement, demonstrable results, and applicability to other companies.

Serving on the selection committee were: **Gerald R. Daniels,** Chief of the Lease Exploration Branch, Minerals Management Service, U.S. Department of the Interior; **Brian T. Petty,** Manager of Government Affairs, International Association of Drilling Contractors; **O.J. Shirley,** Manager, Exploration and Production Public Affairs, Shell Oil Company; and **William P. DuBose IV,** NOIA Environmental and Safety Coordinator. **Russell F. Sammis,** Managing Director of Marsh & McLennon, Inc. and Chairman of the NOIA Safety Issues Subcommittee, presented the award to Mr. **Kelly.**

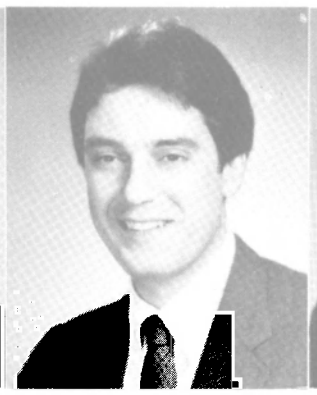
For further information,

Circle 32 on Reader Service Card

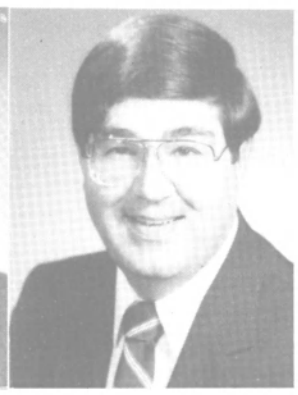
ODECO president **Hugh J. Kelly,** left, accepts the National Ocean Industries' Safety in Seas Award from **Russell F. Sammis,** chairman of the NOIA Safety Issues Subcommittee, at the organization's 14th Annual Meeting in Washington, D.C.



John B. Hopkins



Thomas L. Jelepis



Alexander G. Neagoy

Pickands Mather Promotes Three In Marine Department

Pickands Mather & Company of Cleveland, a subsidiary of Moore McCormack Resources Inc., has announced several personnel changes within its Marine Department. **John B. Hopkins** has been elected manager-fleet marketing and marine traffic; **Thomas L. Jelepis** has been appointed director-marine traffic and dispatch; and **Alexander G. Neagoy** has been named marine traffic coordinator.

Mr. **Hopkins** will direct all marketing, marine traffic, and dispatch activities for PM's Interlake Steamship Company fleet. He joined the company in 1974 and the Marine Group in 1978 as operations assistant-ore traffic. He was promoted to assistant manager-ore traffic and marine sales in 1982, and to manager-fleet marketing and development in 1985.

Mr. **Jelepis'** new responsibilities include handling marine traffic and dispatch activities as well as planning and scheduling cargo movement for the Interlake fleet. He joined Pickens in 1980 as operations assistant-ore traffic and was named ore traffic assistant the following year. He was appointed ore traffic coordinator in 1982 and in 1985 was promoted to assistant manager-ore traffic and vessel dispatch.

New duties for Mr. **Neagoy** will include providing administrative and operating assistance in scheduling Interlake vessels. He will also be responsible for data processing connected with vessel activities. He joined the company in 1985 as ore traffic assistant in the Marine Department.

Sea-Con Services Wins Pipelaying Contract

Sea-Con Services, Inc., 1001 Howard Avenue, Suite 2203, New Orleans, La. 70113, has been awarded a contract by Conoco, Inc. of New Orleans to install 7,000 feet of 4½-inch pipeline from Grand Isle 47 #6 to Grand Isle 47 "L" platforms. Sea-Con plans to perform this work utilizing the pipelay barge Sea Constructor.

For more information,

Circle 97 on Reader Service Card

$25.6-Million Contract To Sperry To Refurbish Missile Cruiser Radar

Sperry Corporation, Defense Products Group, Great Neck, N.Y., is being awarded a $25,577,000 firm-fixed-price contract for the update and refurbishment of AN/SPG-55B radar for the guided missile cruisers CG-16, CG-19, CG-22, CG-29, CG-30 and CG-34. Work will be performed in Great Neck, and is expected to be completed in July 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-5347).

Admiral Irwin Nominated USCG Vice Commandant

Secretary of Transportation **Elizabeth H. Dole** has announced that President **Reagan** has approved and will forward to the senate the nomination of Rear Adm. **James C. Irwin**, commander of the Fifth Coast Guard District, as vice commandant of the U.S. Coast Guard.

Admiral **Irwin** is a 1953 graduate of the Coast Guard Academy. Before taking command of the Fifth District in 1984 his duties were varied, both at sea and ashore. Sea duty included commanding officer on two cutters, the Eagle and Spencer. Shoreside assignments included commandant of cadets at the Academy; chief of staff, Eight Coast Guard District in New Orleans; and chief, Office of Reserve, at Coast Guard Headquarters in Washington.

Monsanto Offers Free 12-Page Bulletin On Fluid Resistance Of Santoprene®

A free 12-page technical bulletin on the "Fluid Resistance of Santoprene®" is being offered by the Monsanto Co. of St. Louis, Mo. Santoprene thermoplastic is a family of advanced elastomers that successfully combines performance characteristics of vulcanized rubber, such as heat resistance and low compression set, with the processing ease of thermoplastics.

This bulletin summarizes the physical properties of Santoprene thermoplastic rubber after exposure to a variety of fluids and solvents. Immersion times were all one week at temperatures ranging from 23°C to 150°C (73°F to 302°F), depending upon the fluid. Results of these tests demonstrate that Santoprene rubber is inherently resistant to a wide variety of oils, solvents, and chemicals.

In addition to an introduction and discussion, the pamphlet contains some seven tables on test results. There is also a list of Monsanto offices around the world where technical and sales assistance are available.

For further information and a free copy of the 12-page bulletin from Monsanto,

Circle 84 on Reader Service Card

McAllister Brothers Appoints Everett Merrill Marine Superintendent

Everett Merrill has joined McAllister Brothers Inc. Towing & Transportation as marine superintendent. The announcement was made by **Brian A. McAllister,** president, who noted that Mr. **Merrill** has been a prominent figure in the towing business of New York harbor for many years. Mr. **Merrill** will be responsible for the supervision of repairs, maintenance, and supplies of McAllister vessels in New York harbor.

Mr. **Merrill** started his long career as a deckhand on tugboats, and remained at sea for 17 years, taking a four-year leave for Navy duty. In 1961, he took a shore position in operations, rising to chief dispatcher. Prior to his appointment with McAllister Brothers, he was manager of operations for Moran Towing & Transportation.

Free 48-Page Catalog Package Available On Appleton Crane Models

A new, free 48-page detailed catalog package is now available fully describing 24 models of Appleton marine cranes.

Data provided for each of the 24 models includes: mechanical drawing showing dimensions; load charts showing outreach figures, boom angles and capacities; a list of standard features and optional features; plus crane selection and operational guides are clearly itemized.

Each of the 24 models is described on a separate full-size data sheet for easy removal and reference.

For a free copy of the Appleton 24-crane catalog package,

Circle 59 on Reader Service Card

Port Of Portland Budget Includes Funds For Marine Improvements

The proposed Port of Portland (Oregon) budget for 1986-87 reflects a conservative projection of financial activity over the next fiscal year to improve, expand, and market facilities and properties to stay competitive and contribute to the economic growth of the community and state. The overall budget totals $290 million, down $27 million from the previous year, representing cautiousness stemming from the Port's experiences in the changing marketplace.

In the individual departments, the Marine budget reflects the Port's continuing commitment to improve its competitive position among West Coast ports. While cargo levels are expected to increase slightly, two new import auto accounts and more stable steamship service are expected to increase auto and container volumes handled at the Port's terminal facilities, providing added revenue.

Marine is expected to generate revenues of $45 million through its operations, while expenses will be $42 million. The department's capital budget of $30.5 million includes funds for projects such as Terminal 2 rehabilitation, a new bulk unloader, and other improvements at the marine facilities.

For free literature on services and facilities offered by the Port of Portland,

Circle 86 on Reader Service Card

American Bureau Names Twenty-Five New Members

Twenty-five maritime executives from 12 countries were elected members of the American Bureau of Shipping at the ship classification society's recent annual meeting held at its new world headquarters in Paramus, N.J. The new members are:

Muzaffer Akkaya, general manager & chairman of D.B. Deniz Nakliyati T.A.S., Istanbul, Turkey; **John T. Cameron**, vice president, Western Region, Chevron U.S.A., Inc., San Ramon, Calif.; **In Yung Chung**, president, Halla Resources Corporation, Seoul, Korea; **Steven Cullen**, president, CRB Management, Inc., New York, N.Y.; **Paul Dahan**, vice president, Mobil Shipping & Transportation Company, New York, N.Y.

James L. Dolan, vice president, American Bureau of Shipping, Paramus, N.J.; **Richard C. Faust Sr.**, division manager-equipment & machinery, McDermott International, Inc., New Orleans; **Helio Paulo Ferraz**, president, Companhia Comercio e Navegacao, Rio de Janeiro, Brazil; **John Gaughan**, Maritime Administrator, U.S. Department of Transportation, Washington, D.C.; **Stanley H.S. Ho**, managing director, Far East Hydrofoil Company, Ltd., Hong Kong.

David E. Leopin, assistant treasurer, ABS, Paramus; Dr. **Y.S. Li**, president, United Ship Design & Development Center, Taipei, Taiwan; **W. William Maitland**, Janson, Green Syndicate, London; Dr. **Giovanni Makaus**, president, Micoperi S.p.A., Milan; **Donald I. Marshall**, Transpac Marine S.A., Manila; **A.A. McArthur**, president & CEO, Halifax-Dartmouth Industries, Ltd., Halifax, Canada.

Thomas S. McIntosh, chairman, president & CEO, Zapata Off-Shore Company, Houston; **J.Y. No**, president, Hanjin Container Lines, Ltd., Seoul, Korea; Rear Adm. **Walter C. Piotti**, Commander, Military Sealift Command, Washington; **Arthur R. Prince**, general manager, Salvage Association, London; Dott. **Alcide Ezio Rosina**, managing director, Finmare Societa Maritima Finanziaria S.p.A., Genoa.

Prof. **Ahmad Shaher Sabit**, Alexandria University, Egypt; **Cesare Sorio**, vice president-marine operations, Ultramar Shipping Company, Inc., Tarrytown, N.Y.; **S.V. Tranchina**, vice president, Great American Insurance Company, New York; and **C. Neville Watson**, group chief executive-Sembawang Group, Sembawang Shipyard, Singapore.

Port Authority In Malaysia Orders Voith Water Tractor —Literature Available

Kuantan Port Authority in Malaysia recently placed an order with Penang Shipbuilding Corporation for a Voith Water Tractor as a ship-handling vessel for the newly built terminal in Kuantan. The decision was made after extensive evaluation of different tugboat designs and propulsion systems, considering also practical experience in different harbors in Malaysia.

The vessel will have a waterline length of about 92 feet, beam of 30.8 feet, and maximum draft of about 14 feet. Displacement will be about 400 tons. Propulsion will be provided by two Stork Werkspoor diesel engines, each with an output of 1,341 bhp, and two Voith-Schneider 26 G II/165 propellers. This combination will give the vessel a free-running speed of 12 knots and a bollard pull of 30 tons.

Three harbor authorities in India have also decided in favor or Voith Water Tractors. The Madras Port Authority has ordered two vessels of 30 tons bollard pull each; the Tuticorin Port Authority has contracted for one tractor of about 35 tons bollard pull; and the new Mangalore Port Authority has ordered one water tractor of about 35 tons bollard pull and one of about 25 tons.

For further information on Voith Water Tractors,

Circle 64 on Reader Service Card

Gee Named Superintendent And Assistant Manager, Wood River Shipyard

James M. Gee has been named yard superintendent and assistant manager of the Wood River Shipyard, division of Louisiana Dock Company. Mr. **Gee** has been with the Wood River Shipyard for 15 years and previously served as assistant yard superintendent.

Louisiana Dock Company operates another full service marine repair facility at Harahan, La. Both yards offer drydocking, wheel repair, machine shop, barge cleaning, sandblasting and painting.

For more information on services offered by Louisiana Dock,

Circle 10 on Reader Service Card

Gastech 85 'Proceedings' Now Available

The Eleventh International LNG/LPG Conference, Gastech 85 was held in the Palais des Congres "Acropolis," Nice, France, from November 12-15, 1985. More than 50 papers were presented in nine working sessions: World Gas Supplies, LPG Production and Trade, Safety and Training, Development of Frontier Gas Fields: The Technological Challenge (a new session for the Gastech meetings), Transportation, Technology & Operations, Commercial, Documentation & Contracts, Gases as Transportation Fuels, Liquefied Gas Terminals and Storage, Technical Developments and Materials.

The "Proceedings" of Gastech 85 have now been published in the form of a substantially sized bound volume containing all the original papers and illustrative material, presentations of these papers and a skilfully edited verbatim report of the ensuing discussion sessions. The volume represents current thinking on virtually all aspects of the LNG and LPG industries and is essential reading and reference material for anyone who has business with these industries.

Copies of the "Proceedings" of Gastech 85 (8¼ inches by 11¾ inches, 580 pages) are available at a cost of £60.00 (or equivalent in other currencies) from Gastech Ltd. 2 Station Road, Rickmansworth, Herts WD3 1QP, England. Telephone: 0923 776363.

◄ **For Aeroquip Literature:**
Circle 147 for Bulletin 5732
Circle 148 for Bulletin 5890
Circle 149 for Catalog 261
Circle 150 for Catalog 305B

NAVSEA Awards GE $4.5-Million For Turbine Generator Set

General Electric Company, Fitchburg, Mass., is being awarded a $4,459,747 modification to a previously awarded firm-fixed-price contract for one integrated base ship service turbine generator set. Work will be performed in Fitchburg, and is expected to be completed in October 1986. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-4313).

Monty Peters Named Bardex Manager-Contracts

Monty Peters

Monty Peters has been appointed manager of contracts for Bardex Corporation in Goleta, Calif., according to **James L. Bartlett**, president.

Mr. **Peters** was formerly project coordinator and manager of European field engineering services for Bardex.

He joined the Bardex London office in 1976, initially to install and commission a large backlog of company skidding systems for the North Sea. He has been involved with most of the major European Bardex offshore and shipyard contracts since then.

Metos Marine Offers New Cabin Fitting Concept —Brochure Available

Through the combined forces of Metos Marine and Parma-Marine, a new building concept for fitting ship cabins and other similar spaces has been conceived. The concept offers a planning service in the initial planning phase of a building project and, using new production technology, prefitted building parts to carry out individual projects.

This method makes the traditional way of building possible even-though the parts are factory-made and prefitted. The customer is able to choose what the delivery will cover, whether it is a complete turnkey package or one including just the supply of panels. Since a comprehensive planning service is included in the delivery, the customer merely provides the necessary specifications.

Metos Marine carries out, on the basis of the customer's specifications, the required layout, design and installation plans of panels, furniture, electricity, plumbing and ventilation. Each shipment is tailored to a customer's resources and individual requirements.

One of Metos Marine's latest customers is Birka Line of Mariehamn, who had all the accommodation spaces, cabins, corridors, etc. of one of their cruise liners fitted using this new concept.

Metos Marine specializes in offering solutions for cooking processes and catering systems which cover all the functions, from receipt of raw material to the handling of waste. The architects and engineers at Metos Marine are ready to plan and carry out a functional layout according to the shipowner's and shipyard's wishes, and will find the most suitable solution for each project.

To date, Metos Marine had delivered systems and complete catering equipment for more than 600 vessels worldwide, and is one of the leading manufacturers and suppliers in this field.

For a free copy of a full-color gatefold brochure from Metos Marine,

Circle 58 on Reader Service Card

Meyer Werft Launches Two Sister Passenger Ships For Indonesia

An impressive double launching was held recently at the Papenburg, West Germany, shipyard of Meyer Werft. Numerous guests attended the ceremony, including some from Indonesia.

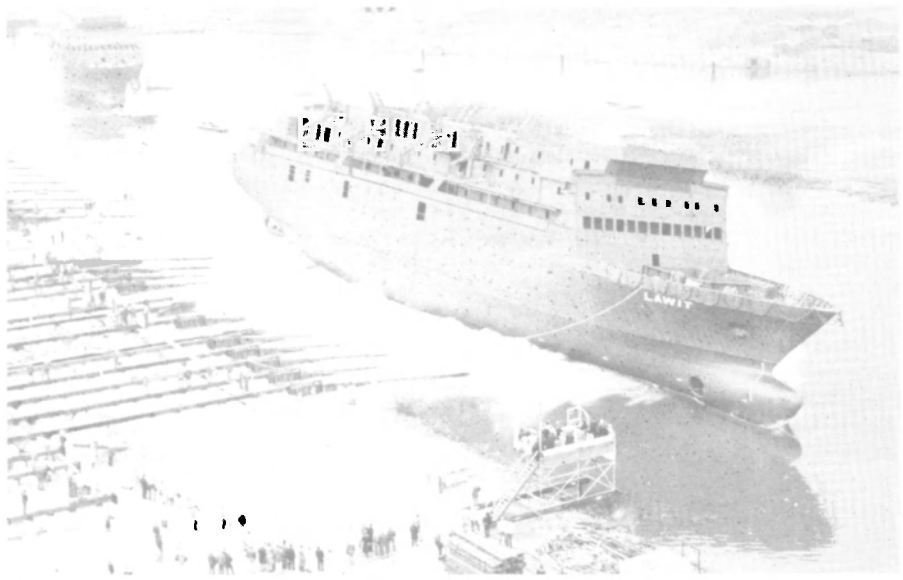
Prior to launch, the 6,400-grt vessels were named Kelimutu, after a mountain on the island of Flores in Indonesia, and Lawit, after a mountain in Kalimantan, Borneo. The sponsor of both ships was Mrs. **R.A. Soerjati Roesmin Nurjadin,** wife of the Indonesian Minister of Communication.

These newbuildings are the fifth and sixth passenger vessels built by the yard for the Directorate General of Sea Communication, Jakarta, and follow a series of four 14,000-grt passenger ships built for the Republic of Indonesia between mid-83 and early 1985.

Delivery of the Kelimutu is scheduled for July this year, with the Lawit to follow in September. The two ships, which have a cruising range of 4,000 nautical miles, will be employed in the Indonesian inter-island service. Accommodations are provided for 920 passengers and a crew of 84.

Propulsion for each ship is provided by two MaK 6MU453 diesel engines, each developing 2,176 bhp at 600 rpm. Service speed at 90 percent of mcr and 15 percent sea margin will be 14 knots. For enhanced maneuverability, each ship is equipped with a bow thruster with controllable-pitch propeller, providing a thrust of about 7.5 tons.

The ships have an overall length of 327.4 feet, beam of 59 feet, depth to weather deck of 30.8 feet, and draft of 13.8 feet. For the safety of passengers and crew, eight motor lifeboats and 20 life rafts are provided, meeting the highest requirements of SOLAS 1974. The ships are built in compliance with the regulations of the Indonesian classification society KI and under survey of Germanischer Lloyd to the class KI +A1001 Passenger Vessel +SM.



The 6,400-grt passenger ship Lawit is launched at Meyer Werft's Papenburg yard. In the background is her sister ship, the Kelimutu.

Navigation equipment includes X-band and S-band radars, gyrocompass, autopilot, echo sounder, radio direction finder, speed log, weather chart recorder, and magnetic compass.

For further information and free literature on Meyer Werft's facilities and capabilities,

Circle 44 on Reader Service Card

From our point of view.

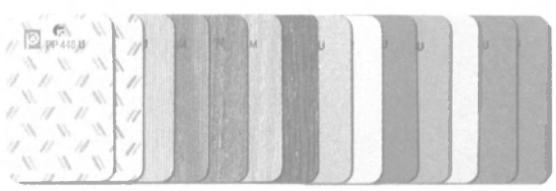
IMAC was created when two world leaders in marine accomodation systems — Perstorp and Isolamin/Ecomax — joined forces. The company represents a new, unique factor in the field of marine interior design. Its objective is to offer naval architects, interior designers and other specifiers the world's most comprehensive range of high quality, purpose designed outfitting materials and components.
Associated to IMAC are E-MODUL — specialized in design and manufacturing of factory built, pilferage-proof sanitary units for marine accomodation — and MOMEK, with a complete range of marine doors and deck covers together with associated furniture and fittings.

IMAC Total Package.

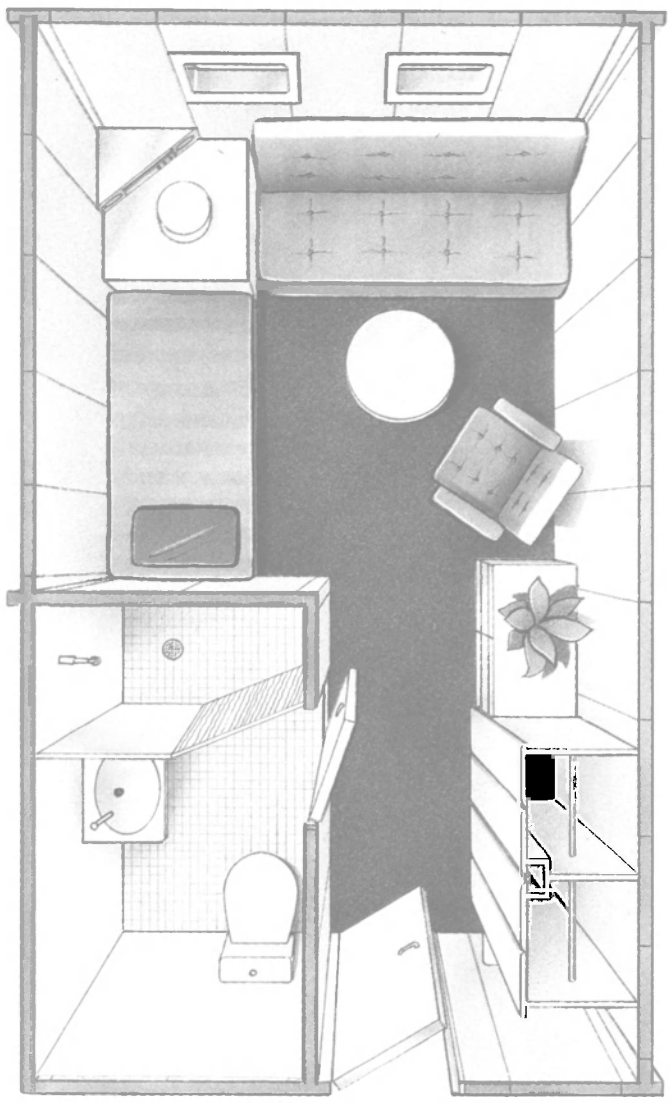
IMAC has the unique capability to offer you:
- Specification service for the fully coordinated accomodation products according to your safety, comfort and design requirements.
- The component package. Complete with matching doors, sanitary units, floating floors and furniture etc.
  Supervision during erection of the system.
  Everything at fixed prices and delivery times, according to your time schedule.

From our point of view this is what you are entitled to when you deal with the world leader in marine accomodation.

On the face of it.



It is difficult to visualize the interior of a modern ship without decorative laminates. IMAC offers the complete range of Perstorp laminates for marine applications. We also supply these laminates bonded to a variety of core materials, including mineral wool, and the wellknown Navilite N.



Self-supporting panelling.

The IMAC marine accomodation systems were designed specifically to rationalize outfitting work. The standard basic module is a bulkhead panel of sandwich construction with an insulating core of noncombustible material between facings of either laminate or sheet steel clad with vinyl film. Though light, the panels have high strength and can support heavy fixtures.

The modular system is very flexible and adapts readily to varying installation parameters.

Ready-made units.

Prefabrication ashore is the most effective way of speeding up interior fitting work onboard ship. This is particulary true in the case of sanitary units — bath, shower and toilet modules — where many trades are involved. E-MODUL specializes in prefabricated marine sanitary units that feature a high standard of furnishings and fittings as well as fast and simple installation. IMAC is now able to offer the complete E-MODUL range on a worldwide exclusive basis.

Purpose engineered doorsets.

The IMAC exclusive selection of marine accomodation systems includes the entire range of purpose-designed doorsets from the specialist manufacturer MOMEK.
The MOMEK modular range comprises fully approved constructions for cabin doors, fire doors, sliding doors etc. The doors provide a high level of sound and thermal insulation.

Do you need to know more about complete marine accomodation systems?
Send away for a full presentation of the IMAC programme!

Circle 157 on Reader Service Card

IMAC SWEDEN

MR

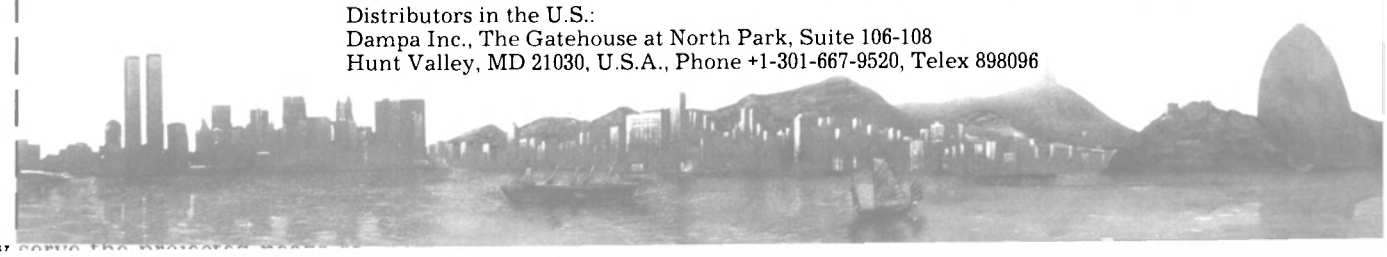
☐ Send me your presentation of the complete IMAC range of products and services.
☐ Contact me! I want to discuss a specific project.

Name _____ Title _____

Company _____ Address _____

Country _____ Phone _____

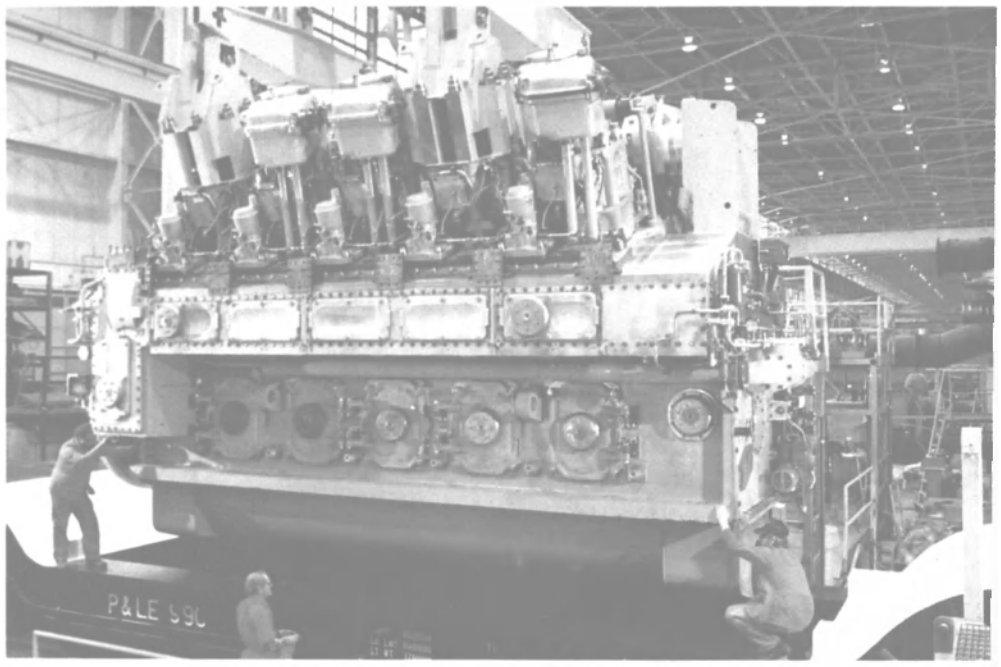
Distributors in the U.S.:
Dampa Inc., The Gatehouse at North Park, Suite 106-108
Hunt Valley, MD 21030, U.S.A., Phone +1-301-667-9520, Telex 898096



McAlpine said, "We know what's ... ciently ... the project ...

PROPULSION UPDATE

Indianapolis distribution center, parts and service.



The Colt-Pielstick PC 4.2 diesel.

Fairbanks Morse Invests In Future— Expands Parts/Service Operations, Increases Production And R&D

Faced with current marine market conditions—an outlook that indicates at least several years of continued low activity in new construction and repowering projects—what strategy should a major manufacturer of diesel engines pursue?

Colt Industries' Fairbanks Morse Engine Division considers this challenging period as an opportunity.

For one thing, the company is actively undertaking a number of programs designed to strengthen relationships with existing customers. In addition, the company is making a substantial commitment to R&D and manufacturing improvements, to enhance productivity and efficiency and to be ready for the next period of increased demand for new power.

"We're taking full advantage of this situation," said **John Stebbins,** marketing and sales vice president. "We've made very substantial capital outlays for new facilities, systems, machine tools and production equipment. The objective is to improve our new engine production capability; equally important, we're finding ways to better support the needs of engine owners for parts and service. As a matter of fact, this effort is already paying dividends—we've been able to lower the prices of hundreds of parts, even though our quality standards have actually been raised.

"We've invested in new quality control and test equipment, including laser measurement and metallurgical testing systems. Our Opposed Piston engineering lab is one of the finest installations of its kind, anywhere. In addition, we now have in place a zero-defects program, a statistical process control system designed to detect any manufacturing problems before bad parts are made.

"In the area of product R&D, we're examining ways to improve fuel economy, increase reliability and lower the manufacturing costs of our engines," Mr. **Stebbins** continued. "We want to be able to offer an even more cost-effective product line when repowering and new construction activity picks up again."

Parts/Service Operations Restructured

Over the last two years, the company has completed a major reorganization of parts and service operations.

"A major part of this program involved relocating our principal replacement parts inventory to a new parts distribution warehouse in Indianapolis, Indiana," said **Paul McAlpine,** parts and service marketing manager. "We stock over 12,000 line items, using more than a million cubic feet of storage area in the new facility. It's well-placed to serve our customers and our satellite service facilities; it's located just minutes from major air, truck and package express carrier terminals.

"Our goal is to provide faster response to our customers' parts and service needs," he said. "We want to help the owner minimize downtime and achieve a maximum return on engine investment. Making our parts and service business operate independently from our new engine business is helping us do that.

"For one thing, we're able to focus more attention on the ongoing needs of existing engine owners, because the parts and service sales operation is now completely separate from new engine sales," he said. "We've also achieved much better control over parts inventory to achieve much higher fill rates."

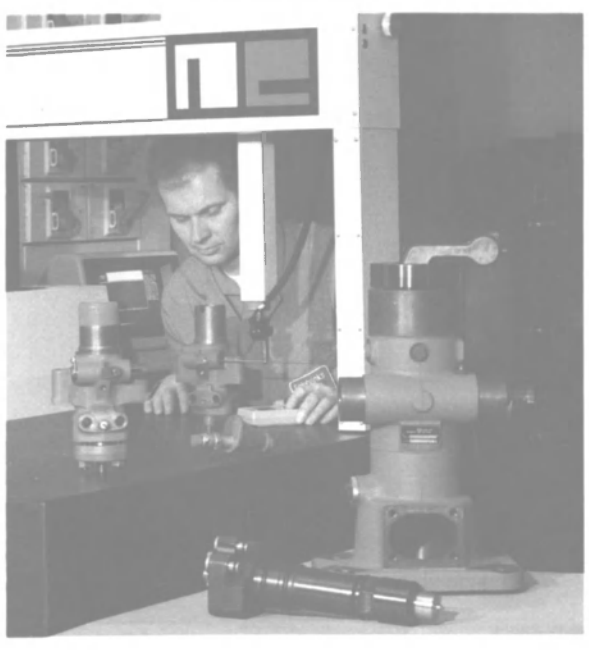
New Computerized Parts Inventory Control

A new computerized inventory control system now links the Indianapolis central parts facility to the factory in Beloit, Wisconsin—and to all regional parts and service centers.

"The new system enables us to respond much more quickly," Mr.

Engine service training programs.

Injector servicing.



Computerized parts inventory control.

From our point of view.

IMAC was created when two world leaders in marine accomodation systems — Perstorp and Isolamin/Ecomax — joined forces. The company represents a new, unique factor in the field of marine interior design. Its objective is to offer naval architects, interior designers and other specifiers the world's most comprehensive range of high quality, purpose designed outfitting materials and components.
Associated to IMAC are E-MODUL — specialized in design and manufacturing of factory built, pilferage-proof sanitary units for marine accomodation — and MOMEK, with a complete range of marine doors and deck covers together with associated furniture and fittings.

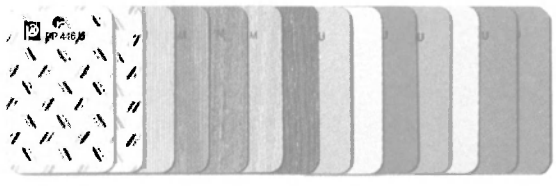
IMAC Total Package.

IMAC has the unique capability to offer you:

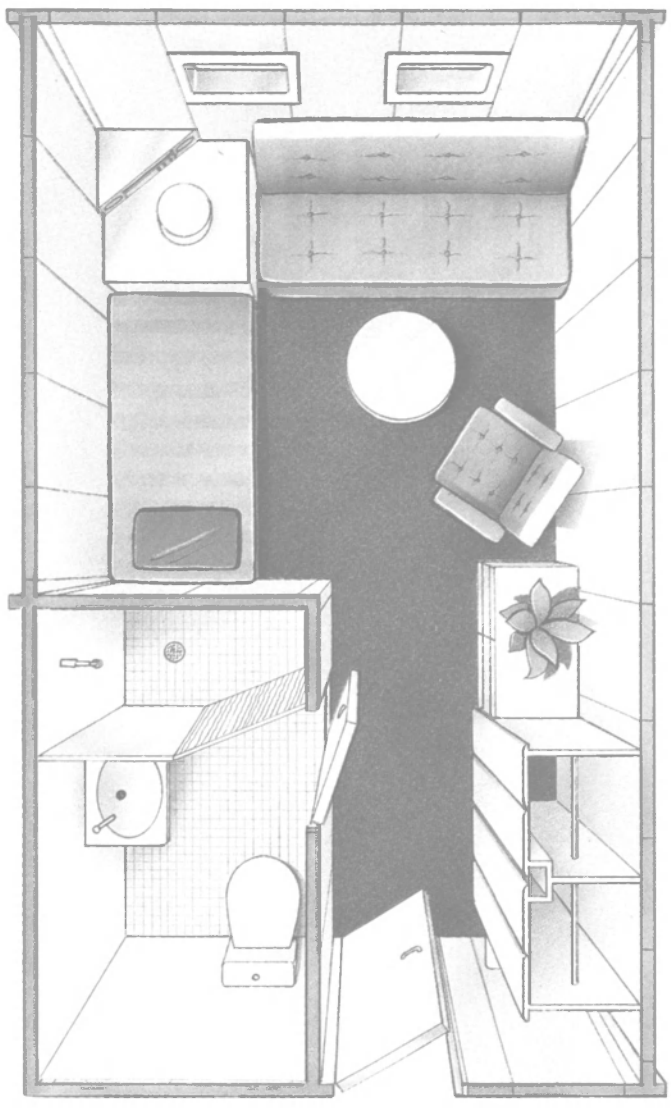
- Specification service for the fully coordinated accomodation products according to your safety, comfort and design requirements.
- The component package. Complete with matching doors, sanitary units, floating floors and furniture etc.
  Supervision during erection of the system. Everything at fixed prices and delivery times, according to your time schedule.

From our point of view this is what you are entitled to when you deal with the world leader in marine accomodation.

On the face of it.



It is difficult to visualize the interior of a modern ship without decorative laminates. IMAC offers the complete range of Perstorp laminates for marine applications. We also supply these laminates bonded to a variety of core materials, including mineral wool, and the wellknown Navilite N.

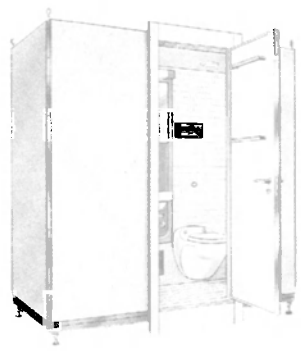


Self-supporting panelling.

The IMAC marine accomodation systems were designed specifically to rationalize outfitting work. The standard basic module is a bulkhead panel of sandwich construction with an insulating core of noncombustible material between facings of either laminate or sheet steel clad with vinyl film. Though light, the panels have high strength and can support heavy fixtures.

The modular system is very flexible and adapts readily to varying installation parameters.

Ready-made units.



Prefabrication ashore is the most effective way of speeding up interior fitting work onboard ship. This is particulary true in the case of sanitary units — bath, shower and toilet modules — where many trades are involved. E-MODUL specializes in prefabricated marine sanitary units that feature a high standard of furnishings and fittings as well as fast and simple installation. IMAC is now able to offer the complete E-MODUL range on a worldwide exclusive basis.

Purpose engineered doorsets.

The IMAC exclusive selection of marine accomodation systems includes the entire range of purpose-designed doorsets from the specialist manufacturer MOMEK.
The MOMEK modular range comprises fully approved constructions for cabin doors, fire doors, sliding doors etc. The doors provide a high level of sound and thermal insulation.

Do you need to know more about complete marine accomodation systems?
Send away for a full presentation of the IMAC programme!

Circle 157 on Reader Service Card

IMAC SWEDEN

MR

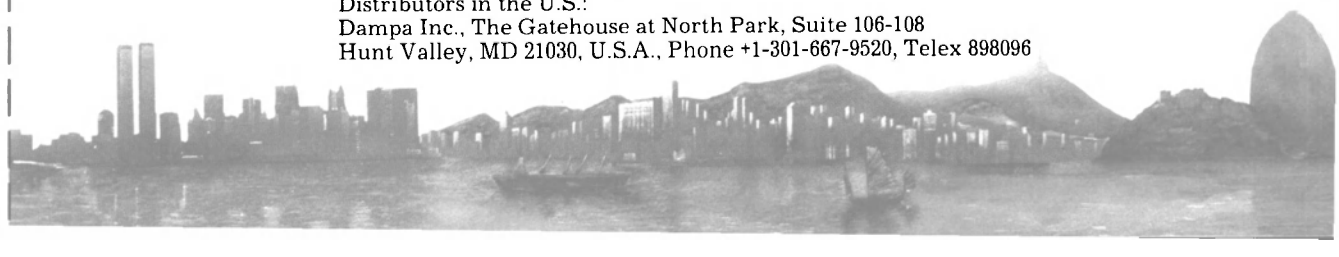
☐ Send me your presentation of the complete IMAC range of products and services.
☐ Contact me! I want to discuss a specific project.

Name _____ Title _____

Company _____ Address _____

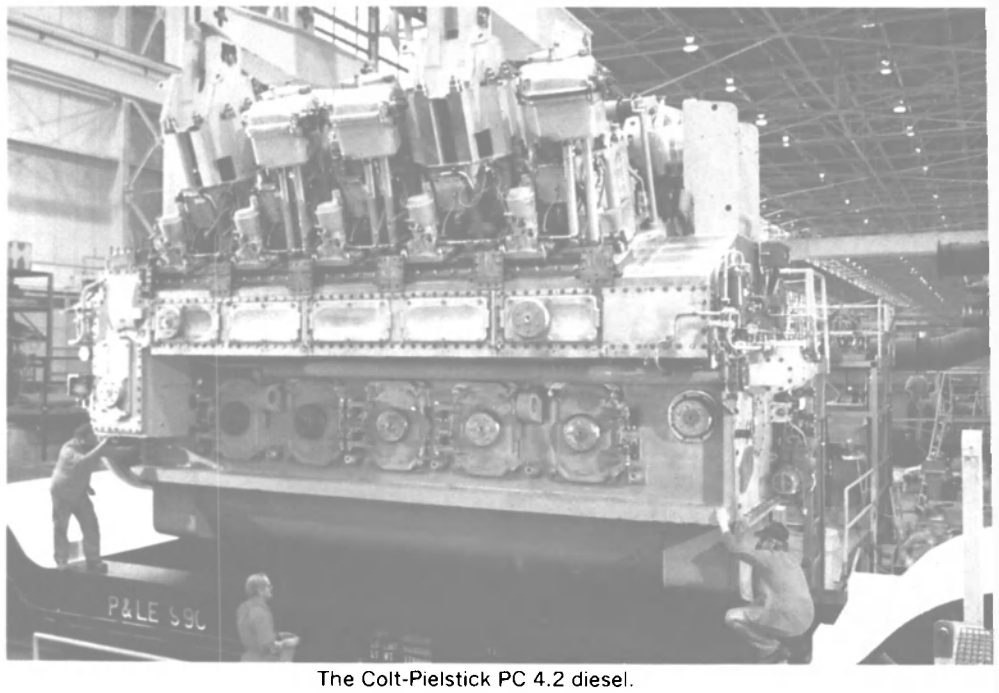
Country _____ Phone _____

Distributors in the U.S.:
Dampa Inc., The Gatehouse at North Park, Suite 106-108
Hunt Valley, MD 21030, U.S.A., Phone +1-301-667-9520, Telex 898096



PROPULSION UPDATE

Indianapolis distribution center, parts and service.



The Colt-Pielstick PC 4.2 diesel.

Fairbanks Morse Invests In Future—Expands Parts/Service Operations, Increases Production And R&D

Faced with current marine market conditions—an outlook that indicates at least several years of continued low activity in new construction and repowering projects—what strategy should a major manufacturer of diesel engines pursue?

Colt Industries' Fairbanks Morse Engine Division considers this challenging period as an opportunity.

For one thing, the company is actively undertaking a number of programs designed to strengthen relationships with existing customers. In addition, the company is making a substantial commitment to R&D and manufacturing improvements, to enhance productivity and efficiency and to be ready for the next period of increased demand for new power.

"We're taking full advantage of this situation," said **John Stebbins,** marketing and sales vice president. "We've made very substantial capital outlays for new facilities, systems, machine tools and production equipment. The objective is to improve our new engine production capability; equally important, we're finding ways to better support the needs of engine owners for parts and service. As a matter of fact, this effort is already paying dividends—we've been able to lower the prices of hundreds of parts, even though our quality standards have actually been raised.

"We've invested in new quality control and test equipment, including laser measurement and metallurgical testing systems. Our Opposed Piston engineering lab is one of the finest installations of its kind, anywhere. In addition, we now have in place a zero-defects program, a statistical process control system designed to detect any manufacturing problems before bad parts are made.

"In the area of product R&D, we're examining ways to improve fuel economy, increase reliability and lower the manufacturing costs of our engines," Mr. **Stebbins** continued. "We want to be able to offer an even more cost-effective product line when repowering and new construction activity picks up again."

Parts/Service Operations Restructured

Over the last two years, the company has completed a major reorganization of parts and service operations.

"A major part of this program involved relocating our principal replacement parts inventory to a new parts distribution warehouse in Indianapolis, Indiana," said **Paul McAlpine,** parts and service marketing manager. "We stock over 12,000 line items, using more than a million cubic feet of storage area in the new facility. It's well-placed to serve our customers and our satellite service facilities; it's located just minutes from major air, truck and package express carrier terminals.

"Our goal is to provide faster response to our customers' parts and service needs," he said. "We want to help the owner minimize downtime and achieve a maximum return on engine investment. Making our parts and service business operate independently from our new engine business is helping us do that.

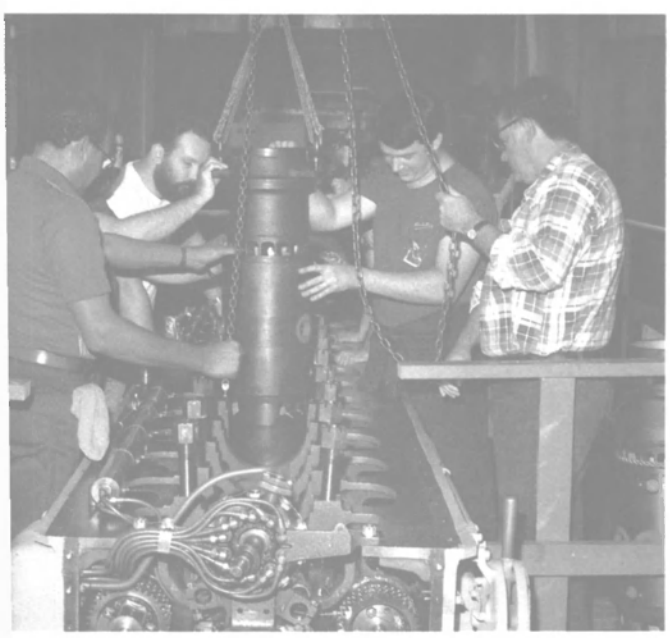
"For one thing, we're able to focus more attention on the ongoing needs of existing engine owners, because the parts and service sales operation is now completely separate from new engine sales," he said. "We've also achieved much better control over parts inventory to achieve much higher fill rates."

New Computerized Parts Inventory Control

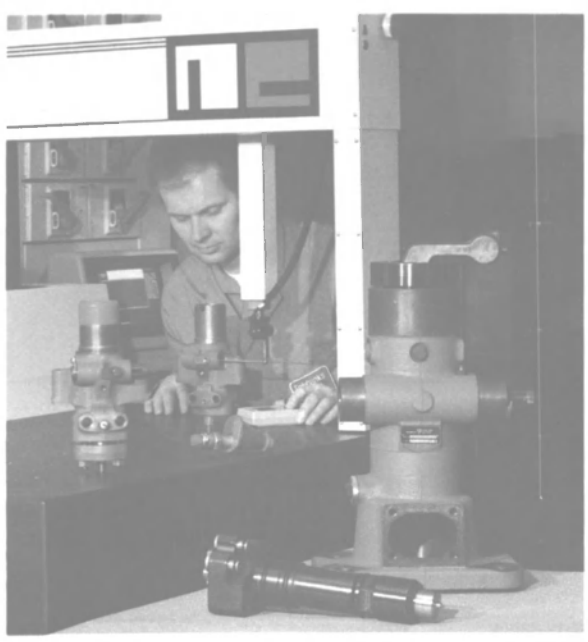
A new computerized inventory control system now links the Indianapolis central parts facility to the factory in Beloit, Wisconsin—and to all regional parts and service centers.

"The new system enables us to respond much more quickly," Mr.

Engine service training programs.



Injector servicing.



Computerized parts inventory control.

McAlpine said. "We know what's available throughout the network, so it's now much easier to ship emergency parts orders from the nearest location with available stock. The system automatically reorders parts as needed to maintain optimum inventory levels at each facility.

"We also have instant access to the latest design configurations, up-to-the-minute pricing information, and the current status of special orders," he added. "The result has been a dramatic improvement in our order fill rate, and we've been able to speed up routine parts deliveries significantly."

In addition, the system is helping Fairbanks Morse make sure the customer orders and receives the right part the first time.

"That isn't something we can take for granted," Mr. **McAlpine** said. "We haven't changed our basic philosophy, which has always been to completely support the equipment we sell. We offer parts and technical support for engines produced 40 or 50 years ago, as well as those currently in production, and we maintain complete records on all the engines we've ever sold. Many have had several rebuilds or have been supplied with custom components. All that information is going into the computer database. When a customer orders a part from Fairbanks Morse he can be sure it's the most modern, up-to-date part available."

Another thing that hasn't changed is Fairbanks Morse's one-year replacement parts warranty.

"We won't change that," Mr. **McAlpine** said. "Reliability is more important to ship operators today than ever before."

Expanded Regional Parts And Service Facilities

Fairbanks Morse has opened a Western Service Region Headquarters in Sparks (Reno), Nevada to better serve marine operations based on the West Coast.

"The new Sparks facility includes an extensive parts distribution warehouse," Mr. **McAlpine** said. "People on the West Coast want to have their spare parts close by. We've also put in the necessary equipment, instrumentation and trained technicians to provide complete fuel injection and governor repair work. This allows us to have rebuilt and exchange assemblies in all western locations to complement the new parts inventory."

A new regional service center has been opened in Chula Vista (San Diego), and the other regional parts and service facilities—in Seattle, Washington, Gretna (New Orleans), Louisiana and Norfolk, Virginia—have been expanded, upgraded and modernized. For example, the Norfolk service center recently moved into new and larger quarters; it now offers complete engine rebuilding services, including a fully equipped fuel injection shop plus the capability or rebuilding blowers, fuel pumps and other accessory components.

"Each regional service center has its own parts inventory," said Mr. **McAlpine.** "We've tailored their stocks carefully, so they can efficiently serve the projected needs of the engine population in their area. Regional centers also offer a remanufactured parts exchange program, which minimizes engine downtime and provides a means of optimizing maintenance costs. They also offer repair and return services, conducted by qualified personnel.

Fairbanks Morse Engine Division now has approximately 60 full-time servicemen based in regional service centers—on call 24 hours a day, 7 days a week. In unusual situations, specialists from the factory in Beloit are also available.

"We also provide complete technical support, backed by a broad range of engineering skills," Mr. **McAlpine** added. "We can help customers to modernize and update their equipment, to obtain optimum performance and incorporate the latest design features. We work with owners to set up advanced maintenance planning and inspection services, and we offer maintenance contracts to match operational pro-

(continued)

Fairbanks Morse

(continued)

files, on an engine, site or system basis.

"In addition to our U.S. organization, we currently maintain a parts and service facility in Halifax, Canada," he said.

"Strategically located representatives outside North America provide parts and service assistance to owners in other parts of the world."

Expanded Engine Service Training Programs

The company now offers an expanded engine service training program through a new diesel training center in Beloit. Six specialized courses are currently offered, covering all Fairbanks Morse Opposed Piston and Pielstick engines.

"The courses are conducted by a professional training staff, assisted by manufacturing, research and engineering personnel," said **Bob Jung,** training supervisor. "Our soundproof classrooms are fully equipped with the latest audio visual and videotape equipment, and the school has two complete engines

and a number of training modules available for hands-on instruction.

"We offer 20-25 individual classes per year, and can also conduct on-site training programs for customers on request. We've had over 500 graduates since our doors opened in January 1984."

While specifically designed to meet the needs of customers, the courses are regularly attended by Fairbanks Morse customer service personnel.

"That always promotes a productive interchange of ideas," Mr. **Jung** added. "Obviously, bringing in our service people for training helps them to do a better job, but is also helps our instructors and factory people to know what's going on in the field. It's been a source of many practical suggestions for product improvement, and it gives service people from different areas a great opportunity to exchange ideas."

Engine Service Training Via Videotape

At present, the company is one of the few engine manufacturers which offer service training videotapes to customers. Now available are a 15-module program covering service of Fairbanks Morse Opposed Piston engines, and a newly developed 16-module program on servicing the Pielstick 4.2 engine.

"The video programs are not intended as a substitute for our classroom courses and hands-on training," Mr. **Jung** said. "The tapes are designed to serve as a training adjunct, and as a refresher. Our regional service centers have all the tape modules available for customer review, and they also use them in conducting service training locally."

R&D For The Future

"We're currently working in a number of product development areas," said **Mel Weiss,** manager of marine sales applications. "Whatever the future brings, operators are sure to want better maintainability and reliability built into the engines they buy, and the desire for better fuel consumption will always be important—much of our R&D effort is in that direction. We're also developing heavy fuel technology.

"We think the trend toward higher efficiency engines will continue,

and we're working on ways to get more output out of the same space. Larger engines with fewer cylinders in a given space will last longer and be easier to maintain, due to fewer moving parts."

Current R&D work on Fairbanks Morse Opposed Piston engines is concentrating on improving engine productivity, reliability and maintainability, according to Mr. **Weiss.**

"We're experimenting with new casting steels, which can be welded," he said. "We're also looking at ways to build the engine block in modular sections, to eliminate many difficult welds and make up different sizes of engines from standardized sections.

"We're examining several alternative designs of turbochargers, and evaluating methods of fine-tuning the fuel injection system. In addition, we're considering removing the blower for some applications where the engine runs at a constant speed, such as ship generator sets."

Colt-Pielstick engines have been under constant development for several years. The company now offers the PC-2 Series in inline configuration (6 through 9 cylinders, up to 6,600 hp) in addition to the more familiar V-8 configuration (12 to 18 cylinders, up to 13,200 hp).

"The new Pielstick PC2.6 is an advanced design of the PC2.5 engine," said Mr. **Weiss.** "It's very competitive in terms of fuel consumption. It uses a modular pulse turbocharging system, and the injection system has been reworked. The result is a substantial gain in BMEP, and an 8 percent improvement in fuel consumption."

Colt Industries' Fairbanks Morse Engine Division offers a broad line of marine diesel engines for main ship propulsion and standby power. Fairbanks Morse 38D8⅛ Series O-P engines are available with 4 to 12 cylinders, ratings from 700 to 4,200 hp. As noted above, the Colt-Pielstick PC-2 Series is available in inline and vee configurations from 6,600 to 13,200 hp, and the PC-4.2 offers ratings from 16,200 to 29,200 hp.

For descriptive literature covering the company's new parts and service operation, training programs, videotapes or diesel engine, circle the appropriate number on the reader service card in the back of this issue:

New parts and service operation,
Circle **1** on Reader Service Card
Training program,
Circle **2** on Reader Service Card
Videotapes,
Circle **3** on Reader Service Card
Diesel Engines,
Circle **4** on Reader Service Card

Tracor Receives $6.4-Million Contract

Tracor Applied Sciences, Rockville, Md., is being awarded a $6,365,796 cost-plus-fixed-fee contract for engineering support for submarine programs. Work will be performed in Rockville and is expected to be completed November 30, 1986. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

Borg-Warner Changes Name To York International

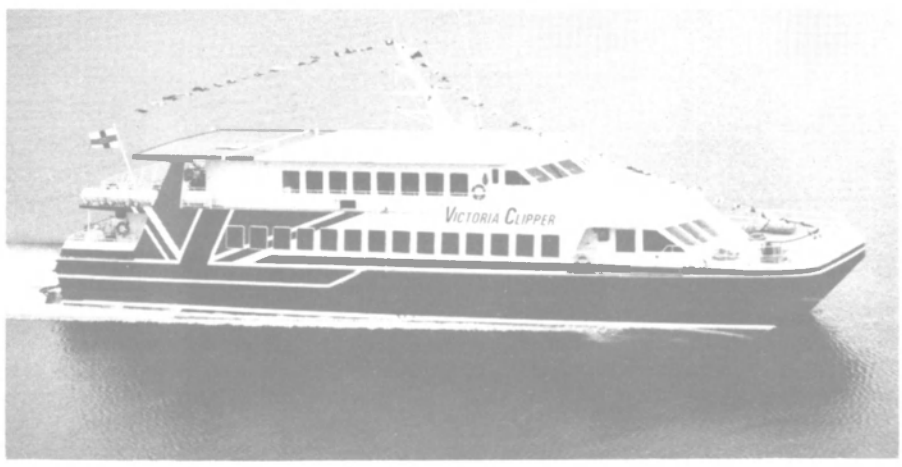
Borg-Warner Air Conditioning, Inc. has changed its name to York International Corporation (YIC), headquartered in York, Pa. According to president and chief executive officer **Thomas J. Vincent,** the new name brings the company, its products and services, and its people together under an identity that reflects the worldwide scope of its business.

YIC is comprised of two major domestic units, Applied Systems and Central Environmental Systems, and one international segment, York Air Conditioning and Refrigerational Inc. All three groups are headquartered in York.

York's Marinepak air conditioning chilled water coolers and condensing units are fully factory assembled to save space and installation costs, and custom tailored to each need. More than 1,000 Marinepaks have been installed on both merchant and naval vessels.

For further information on York International's product line for marine applications,

Circle 93 on Reader Service Card



The 300-passenger catamaran Victoria Clipper features a paint scheme reminiscent of the British Union Jack.

Passenger Catamaran To Operate Between Seattle And Victoria

A 300-passenger catamaran to begin operating in June this year between Seattle and Victoria, B.C., will offer a fast, comfortable cruise through some of the Northwest's most beautiful waters. Built by Fjellstrand A/S in Omstrand, Norway, the 127-foot Victoria Clipper will be operated by Clipper Navigation, Inc. of Mukilteo, Wash. She is designed to provide the best possible ride in any kind of weather and sea conditions.

The all-aluminum vessel is powered by water jets driven by MTU 16V 396 TB 83 diesel engines, each with an output of 2,010 bhp at 1,940 rpm. Passengers will ride in comfortable two-by-two seating—208 on the main deck and 92 on the upper deck—in surroundings designed and decorated by the same firm that designed the interiors of the Royal Viking Line cruise ships.

Both upper and lower decks are surrounded by large windows giving passengers nearly unobstructed views of the beautiful route up Puget Sound and across the Strait of Juan de Fuca. In addition, upper deck passengers will be able to watch the captain and crew at work during normal daylight operations through a glass wall separating the passengers from the wheelhouse. Shades will be drawn across those wheelhouse windows at night to protect the crew's night vision for safe operations.

For passengers who prefer more companionship or a friendly card game during the cruise, there will be some tables surrounded by similar two-by-two seating, while some 40 outdoor seats will be available for those who want to take a break in the open air, though the vessel's cruising speed of more than 30 knots may make the open deck too brisk for some.

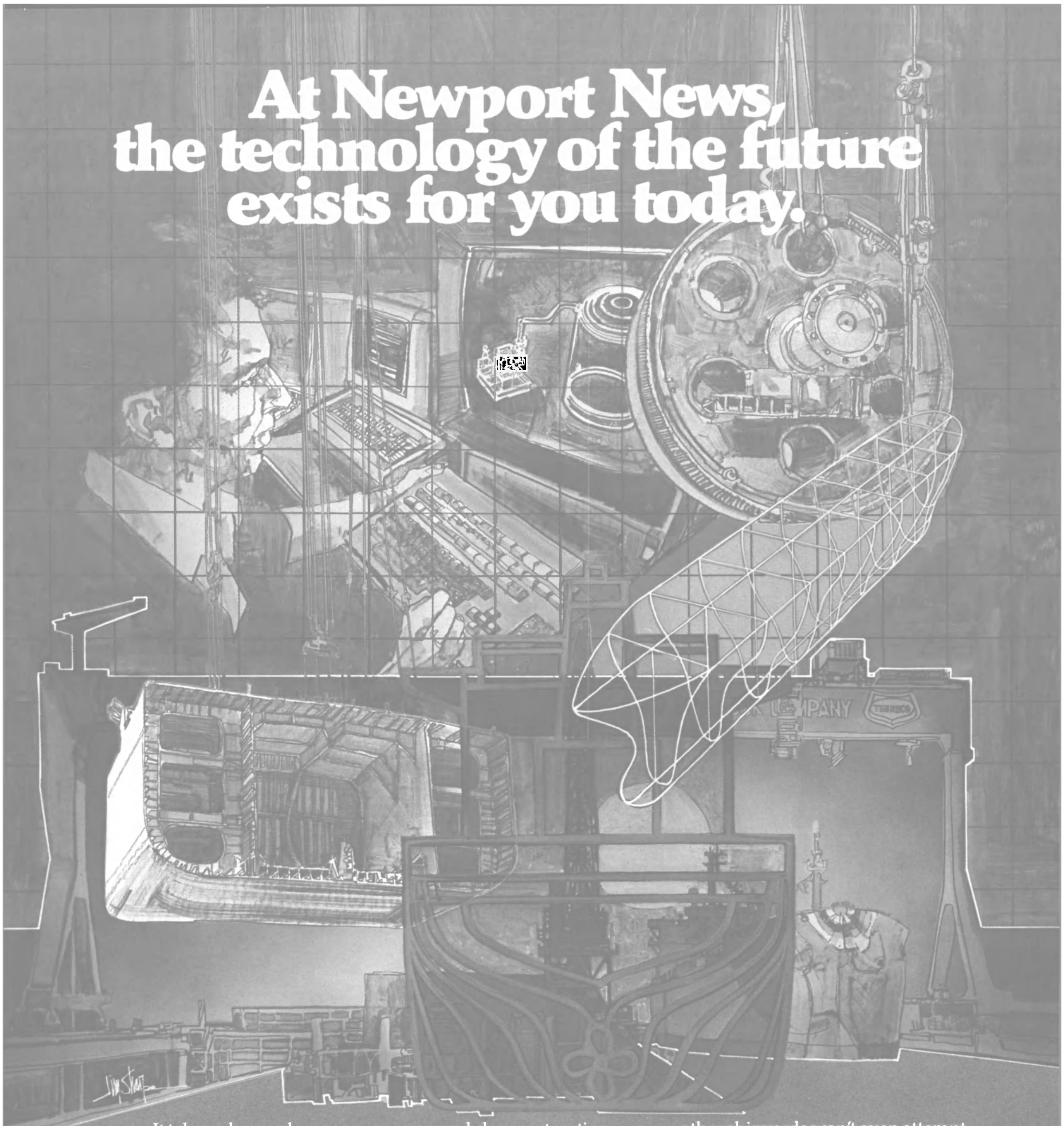
A containerized loading and storage system will insure that passengers' luggage is protected throughout the cruise. The container will be loaded ashore, locked and loaded onto the Victoria Clipper. At the destination, the still-locked container will be offloaded for luggage distribution ashore.

For passengers who want to bicycle around Victoria or Seattle, the vessel will have protected space abroad for about 30 bikes.

For further information on Fjellstrand,

Circle 28 on Reader Service Card

At Newport News, the technology of the future exists for you today.



It takes advanced technology, superior facilities and imagination to design and build the most sophisticated ships in the world.

At Newport News these capabilities are at your service.

Our integrated Computer Aided Design/Computer Aided Manufacturing System, our modular construction techniques and our 900-ton superlift capacity enable us to build every kind of commercial ship to your specifications. And deliver on time.

So when you need a ship built to specific requirements, come to us. We can handle the toughest jobs, including some other shipyards won't even attempt.

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

Newport News Shipbuilding
A Tenneco Company
Newport News, Virginia 23607

Circle 166 on Reader Service Card

U.S. SHIPBUILDING
$Billions In Navy Work Plus Repairs Brighten The Picture

The number and tonnage of vessels delivered by U.S. yards during the past year were up from 1984, thanks mostly to construction for the Military Sealift Command's build-and-charter program. Six of the nine ships completed, and 155,862 of the total 164,711 dwt, were for charter to the MSC.

General Dynamics' Quincy, Mass., shipyard delivered the last of five RO/RO T-AKX maritime prepositioning ships, the Sgt. William R. Button, in May this year. **Amship's** Tampa Shipyards in Florida also completed the last of five T-5 tankers for MSC charter; the Laurence Gianella left the yard in late April this year. The Tampa yard will now presumably concentrate on repair work.

The sole new merchant ship ordered during the past year went to **McDermott Shipyards,** headquartered in New Orleans, for a 2,830-gt hopper dredge for American Dredging. The vessel will be delivered in mid-1987. Of the six vessels currently on the merchant ship orderbooks at U.S. yards, two are scheduled for delivery later this year and the remaining four will be completed by June of next year.

$Billions In Navy Work

Again, the U.S. Navy's newbuilding and overhaul/repair programs are responsible for the continued health of many U.S. shipyards. There are at least nine major commercial shipyards currently involved solely in Navy new construction. Some dozen smaller yards have received Navy, Coast Guard, and MSC contracts for smaller craft. In the repair and overhaul sector, it seems that every yard is in the act. And repair will be on the increase as the size of the Navy fleet grows.

At present, Navy plans call for annual expenditures as follows:

NAVY
(Annual—Aircraft Not Included)

	$Billions
R. D. T & E	10
New Ships	12
Ship Repair & Modernization	6
Electronics	7
Weapons	7
Annual Expenditure	$42 Billions

Projected over the next five years, this adds up to a total in excess of $200 billion. Since the law dictates that all new U.S. Navy vessels be constructed in private shipyards, and since the Navy traditionally allocates 30 to 40 percent of repair and overhaul work to private yards, the Navy is a definite bright spot in the U.S. shipbuilding picture for both the yards and equipment suppliers.

In Fiscal Year 1985, the U.S. shipbuilding and ship repair industry invested more than $250 million in modernization of facilities and in expansion. As of July 1, 1985, the industry planned to spend at least an additional $100 million during the year ending this month. The emphasis has been on the expansion of ship repair facilities.

According to the Martitime Administration's latest annual survey of U.S. shipbuilding and repair facilities, there were 24 active yards able to build major oceangoing or Great Lakes vessels of 1,000 gross tons or more. Last year, 69 percent of some 115,000 shipyard workers in the country were employed in these yards. Of that total, 94 percent were engaged in Navy or Coast Guard construction or repair.

Three yards thought lost have been revived under new management. **Todd's** former Brooklyn yard was bought late last year by Rodermond Industries of New Jersey. The yard is now operating as the **New York Shipyard Corporation. American Ship Building's** former Toledo, Ohio, shipyard was purchased by the Toledo-Lucas County Port Authority and is now being operated by **Merce Industries.** The **Upper Peninsula Shipbuilding Company** yard in Ontonagon, Mich., has been bought by the Wedtech Corporation of New York.

Following is a run-down of the situation in major U.S. shipyards.

East Coast

Bath Iron Works Corporation in Bath, Maine, operated the BIW newbuilding and repair yard in Bath and the nearby Portland repair facility. The two yards currently employ a total of some 6,800 workers and are involved in new construction and overhauls for the Navy and the Coast Guard.

A Boston shipyard, **General Ship Corporation,** recently received an $8-million Navy contract for the modernization of a frigate.

There is now newbuilding of major consequence in the New York area. However, ship repair yards such as **Coastal Dry Dock** and the **New York Shipyard Corporation,** both in Brooklyn, are anxiously awaiting a final decision on the homeporting of the USS Iowa and her acompanying escort ships in Staten Island. They feel that move would be a boost for their business.

The **Pennsylvania Shipbuilding Company** in Chester has been involved in repair and conversion work. Conversions have been performed for the MSC, while the commercial repair side is holding up well. The Chester yard also has Navy contracts for the construction of three T-A0-187 Class fleet oilers at a total price of almost $320 million.

With the closing of two major repair yards in the past few years—Maryland Shipbuilding and Bethlehem's Key Highway yard—Baltimore is left with only the **Bethlehem Sparrows Point** yard. Primarily a newbuilding yard in the past, the Sparrows Point facility has most recently been involved in major conversions for the MSC and has also received a Navy contract for construction of two surveying vessels at a total cost of $132 million. The yard recently added a two-position intermediate gate in its 1,200-foot building basin; this allows for more flexibility for repair jobs and smaller shipbuilding.

In Virginia, **Newport News Shipbuilding** (NNS), a Tenneco company, is the country's largest shipyard, and this year is celebrating its centennial. Some 30,000 people are employed by NNS, and $600 million has been spent in the past six years on capital improvements, with an additional $400 million to be spent during the next four years. Major work at NNS involves construction of nuclear-powered aircraft carriers and submarines, as well as overhaul of these vessels. But the company is not adverse to booking a commercial vessel for repair or conversion.

Nearby **Norfolk Shipbuilding and Dry Dock Company** last year completed one of the three non-MSC vessels delivered, a 2,000-gt ferry for the State of Delaware. A new 20,000-ton lifting capacity drydock was installed at the yard's Pier 1 complex last September. Two smaller repair yards are in the same area—Metro Machine, with a floating drydock 660 by 96 feet; and the **Jonathan Corporation,** a topside repair facility in Little Creek.

In Jacksonville, Fla., the **Jacksonville Shipyards** is fortunate in it proximity to the cruise liner trade, and specializes in annual drydockings of these ships operating out of Florida ports. Employment is now 1,500, down about 1,000 from last year. But the yard manages to have from three to five ships in for work at all times. A Navy topside repair facility at Mayport accounts for about 20 percent of the company's business.

Gulf Coast Yards

On the Florida Gulf Coast, the **Eastern Marine** yard in Panama City is an aggressive smaller yard busy with repair and newbuilding of smaller craft. It is also building a 200-foot barge to work with the hopper dredge being built by McDermott for American Dredging.

The **Tampa Shipyards** in Florida, as mentioned before, completed its five-ship contract for build-and-charter T-5 tankers for the MSC with the delivery of the last two vessels in February and April this year; the first three were completed last year. Tampa is now without newbuilding orders, but is in a good position for repair work, with new graving docks that can handle vessels up to 740 feet long, and wet berths for ships up to 900 feet long.

Alabama Dry Dock and Shipbuilding Corporation (ADDSCO) is on Pinto Island in Mobile. Employment at this facility is currently 1,200, up from 650 in mid-1985. Work involves a steady

(continued)

Bailey Controls

Bailey NETWORK 90® : A microprocessor-based system so versatile, so adaptable that it delivers what you could only wish for up to now—**total vessel monitoring and control.**

Not just engine room control. But monitoring and/or control of radar, cargo tank level and temperature, inert gas pressure and ballast tank level. Electric control of pumps and valves. Load calculations. Monitoring and alarming for unmanned machinery. The whole ship's log of normally separate control functions —now right at your fingertips. For everything from deep-draft ocean-going vessels right down to smaller river and harbor craft.

Think what NETWORK 90 could save in labor, equipment and installation costs. How it could streamline and integrate your whole vessel operation. How this self-diagnosing, A.B.S. qualified Bailey system could put **you** on a new course for control efficiency. Microprocessor-based Bailey technology provides the security so vital for today. Modular system design plus a wide range of NETWORK 90 compatible products offer easy expansion tomorrow.

Total-control NETWORK 90. It's for people who want to run a very tight ship very economically. For full details, write us at 29801 Euclid Avenue, Wickliffe, Ohio 44092. Or call us toll-free at (800) 554-9030; in Ohio, (800) 554-9029. Bailey Controls, division of Babcock & Wilcox, a McDermott International company.

Where the world comes for energy solutions.

Circle 170 on Reader Service Card

U.S. SHIPBUILDING

(continued)

flow of merchant ships in for repairs, and Navy overhauls. ADDSCO also maintains a group of laid-up offshore drilling rigs. This yard holds a tentative contract for the modernization of the SS United States.

Also in Mobile is **Bender Shipyard,** busy with smaller vessel overhauls for the Navy, and currently converting a dredge to diesel propulsion for the U.S. Army Corps of Engineers. Further along the Gulf Coast, in Escapawpa, Miss., is the **Moss Point Marine** yard, whose orderbook shows a backlog of supply vessels and tugs for the Gulf. Two LCUs for the Navy are to be completed early next year.

The **Ingalls Shipbuilding** division of Litton Industries in Pascagoula, Miss., is all Navy work these days. Ingalls is the lead yard for the Ticonderoga Class (CG-47) Aegis guided missile cruiser. The yard has also overhauled various Navy ships, including the modernization of the battleship USS Iowa.

The only new commercial shipbuilding order placed last year (and the last to date for a U.S. shipyard) was the $15.8-million contract awarded to **McDermott's Amelia, La.,** yard for a 288-foot hopper dredge. The price included a 200-foot barge to be built by Eastern Marine.

Avondale Shipyards near New Orleans was sold last year to its employees under an employees stock ownership plan (ESOP) by parent company Ogden Corporation. This complex of yards is the busiest in the Gulf area, and includes the **Harvey Quick Repair** yard for offshore vessels, tugs, and barges, and the upper and lower Avondale yards. Earlier this year, Avondale's backlog was $1.5 billion and employment was up to about 6,000. In February this year, the yard launched the second of six Kaiser Class (T-AO-187) fleet oilers for the Navy under contracts totaling $715.5 million. The yard completed its share of the SL-7 conversions for the MSC with the delivery of the third former Sea-Land ship, now the USNS Pollux (T-AKR-291) in March this year.

Todd's repair yard in New Orleans, plagued by a strike last year, was "idled" in December and put up for sale early this year. The Port of New Orleans is trying to keep the 15,000-ton drydock that Todd had under lease from the Navy.

Halter Marine's yards are busy with tug and supply boat construction and also built two patrol launches for Nigeria. Under con-

(continued)

Merchant vessels—2,000 DWT and over—completed in U.S. shipyards in 1985 (self-propelled, diesel powered)

Shipyard / Name of vessel	Owner	Type	Hull No.	Keel laid	Launched	Delivered	Dimensions (ft) Length	Beam	Depth	Gross tons	Dead-weight	Horse-power
GENERAL DYNAMICS, QUINCY SHIPBUILDING DIVISION, QUINCY, MASSACHUSETTS												
2nd Lt. John P. Bobo	Braintree Marine Transport	Ro/Ro T-AKX	61	7/1/83	10/13/84	2/14/85	671.2	105.6	29.6	34,500	22,454	27,800
PFC Dewayne Williams	Braintree Marine Transport	Ro/Ro T-AKX	62	9/1/83	11/12/85	6/29/85	671.2	105.6	29.6	34,500	22.454	27,800
Lt. Baldomero Lopez	Braintree Marine Transport	Ro/Ro T-AKX	63	3/23/84	6/29/85	11/20/85	671.2	105.6	29.6	34,500	22,454	27,800
JEFFBOAT, JEFFERSONVILLE, INDIANA												
Eastern Sun	Sun Transport	Tanker	—	—	2/2/85	5/27/85	280	45	16.5	1,579	3,549	2,900
NORFOLK SHIPBUILDING & DRYDOCK CORPORATION, NORFOLK, VIRGINIA												
Cape May	Delaware RY & Bridge Auth.	Ferry	163	—	—	4/20/85	—	—	—	2,000	500	8,000
TAMPA SHIPYARDS, INC. (AMSHIP), TAMPA, FLORIDA												
Gus W. Darnell	Ocean Products Tankers	T-5 Tanker	1121	11/14/83	11/12/84	9/11/85	615	90	53.8	18,000	29,500	15,300
Paul Buck	Ocean Products Tankers	T-5 Tanker	1122	12/2/83	9/17/84	6/8/85	615	90	53.8	18,000	29,500	15,300
Samuel Cobb	Ocean Products Tankers	T-5 Tanker	1123	2/8/84	2/4/85	11/15/85	615	90	53.8	18,000	29,500	15,300
TWIN CITY SHIPYARDS, ST. PAUL, MINNESOTA												
Ouachita	Gulf Coast Trailing	Hopper/ Dredge	885	8/7/84	5/27/85	12/23/85	—	—	—	3,400	4,800	8,000

TOTAL PRODUCTION IN 1985: 9 VESSELS, 166,479 GROSS TONS, 164,711 DEADWEIGHT TONS

Standard built-in adjustable stroke stops from 80° to 100° of travel.

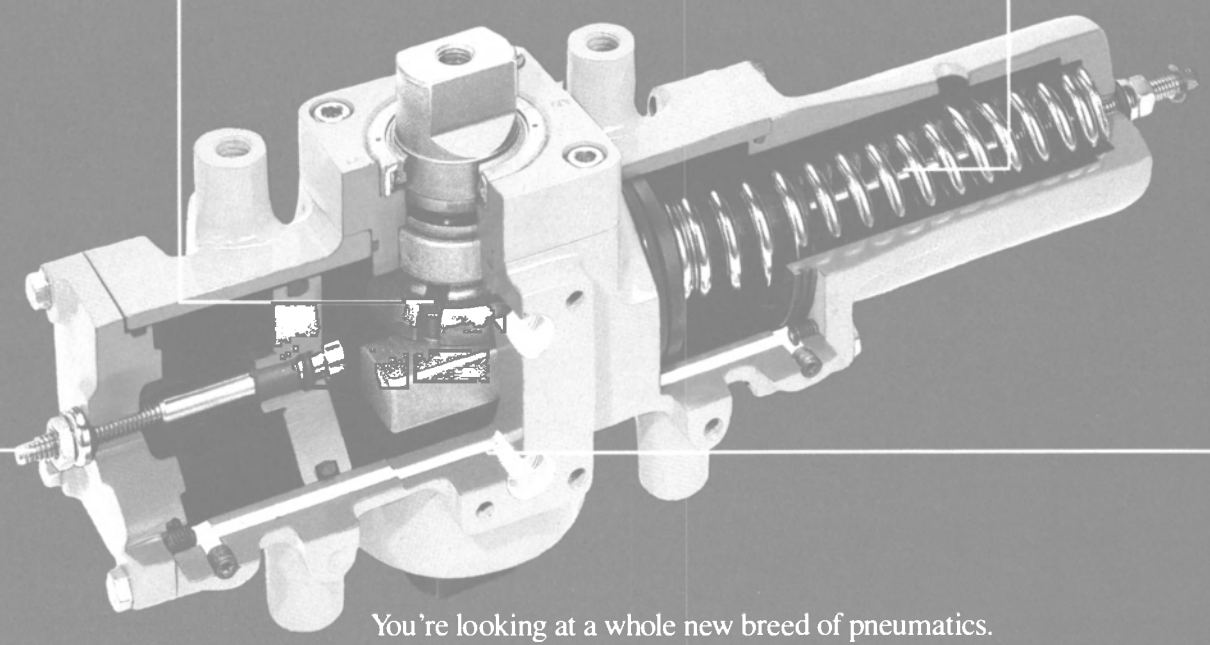
Double Scotch Yoke mechanism for superior balance and a more symmetrical configuration.

Double-acting and spring return models with torque outputs form 70-250,000 inch-lbs on supply pressures from 40 to 150 P.S.I.

All cast iron construction for extra durability in harsh or adverse environments.

Introducing
The New HR Series
Pneumatic Actuators
From Limitorque.

A Turn For The Better.



You're looking at a whole new breed of pneumatics. Double-acting and spring returns with double, scotch yoke mechanisms mean an actuator that delivers superior torque characteristics with total valve control reliability (a feature sometimes a little difficult to pin down with rack and pinion or single yoke construction). And because harsh environments take their toll all too quickly, ours is made of all cast iron to match the durability of our big "muscle" actuators. But for all its impressive features, we know that price and availability are at the heart of the matter. So you can take heart in knowing the new HR Series is very competitively priced and available in stock for immediate delivery. Add a full range of optional controls to meet your most exacting specifications, and you've got a pneumatic you can specify and forget. Because we not only back you with the industry's toughest new line of pneumatics, we'll support you every step of the way. It's what you'd expect from Limitorque. And we wouldn't deliver less. Our free brochure will tell you more. Just write or call.

Limitorque

Limitorque Corporation 5114 Woodall Road Lynchburg Virginia 24506 (804) 528-4400 Telex 82-9448

(continued)

tract for the Navy are two ocean surveillance ships at a total cost of $28.5 million.

Southern Shipbuilding Company in Slidell, La., is building a non-self-propelled dipper dredge for Great Lakes International scheduled for completion later this year.

The big news around Beaumont, Texas, is the opening of **Bethlehem's** new **Sabine** repair yard in Port Arthur last August. This facility operates a 64,000-ton lifting capacity drydock that is one of the country's largest. The eight-section dock, formerly at the Navy Yard in Pearl Harbor, can accommodate vessels up to 1,000 feet long. It is leased by Bethlehem from the Port of Port Arthur, and has maintained an approximate two-month backlog of repair work since opening. **Bethlehem's Beaumont** yard, meanwhile, completed the conversion of the second of two Maersk Line vessels for the MSC's charter program last September.

Todd's Galveston, Texas shipyard recently completed the first of two T-AVB conversions for the MSC. The USNS Wright (T-AVB-3) left the yard on May 1 this year. The contracts for these two aviation logistics ships totaled $30 million. Up from Galveston, on the Houston Ship Channel, is the **Houston Ship Repair** yard. This facility is a complete topside repair yard, with a berth that can accommodate ships up to 780 feet long.

West Coast Yards

Lockheed Shipbuilding in Seattle recently completed the second of three dock landing ships for the Navy. The yard is the lead contractor for the LSD-41 Class. The third vessel of the class, the Fort McHenry (LSD-43), under construction at a cost of $271.5 million, will be commissioned in 1987. Lockheed has also opened a repair division, **Lockport Marine,** in the Port of Portland, Oregon's ship repair complex.

Todd's Seattle yard has a Navy contract to construct an ARDM floating drydock, and has a $235-million ongoing contract to overhaul five U.S. Coast Guard cutters through 1990.

Several smaller yards in the Seattle area are doing well. **MARCO,** well known for its fishing vessels, recently received a $2-million contract to convert a cargo ship to a state-of-art reefer vessel. **Foss Shipyard** division of Seattle's Foss Launch & Tug Company has its drydocks in full service from last October through April for repair work.

One of the busiest West Coast shipyards in the merchant ship repair sector is the **Port of Portland.** The Port operates the largest drydock on the West Coast, shared by **Northwest Marine Iron Works, Gunderson, Inc.** (formerly FMC Corporation), **Dillingham Ship Repair, Daniel Construction** (Fluor Corporation), and the recently formed **Lockport Marine.** The Port has reduced tariffs on military projects, ship repair contractors have cut their management costs to the bone, and the metal trades unions have cut their basic wage on military contracts by 26 percent—all this in an effort to compete more favorably on military and commercial contracts.

A $2.8-million offshore module launch system and wharf structure were completed at PSRY recently. The Portland yard complex represents a $200-million investment, and the battle to keep the port's repair facility is aggressive.

Todd's San Francisco shipyard, is leased from the San Francisco Port Commission. Lately, work has been mostly repairs and over-

Major commercial vessels under construction or on order in U.S. shipyards
(Or 2,000 deadweight tons and over—as of June 1, 1986)

Shipbuilder	Owner	Hull Nos.	Type	Total No.	Total GT (est)	Total DWT (est)	Total HP	Est. Deliv.
Bay Shipbuilding	Sea-Land Services	735-7	Ctr	3	47,355	48,390	66,240	86-87
McDermott Shipyards	American Dredging	276	H/Drdg	1	2,830	—	5,200	4/87
NASSCO	Exxon Shipping	438-9	VLCC	2	179,460	411,792	64,480	86-87
	TOTAL			**6**	**229,645**	**460,182+**	**135,920**	

hauls for the Navy. The same can be said for the **Triple A** yard at Hunter's Point, a mostly repair complex leased from the city and a former Navy yard. The **Continental Maritime** yard in San Francisco put a newly acquired, 26,000-ton drydock to work late last year with Navy overhauls.

Early this year, **Todd Pacific's Los Angeles Division** yard in San Pedro won the coveted contract to reconstruct the Matson liner Matsonia. The $33-million job will increase the length of the ship from 700 to 760 feet. Redelivery of the vessel is scheduled for the spring of 1987. The San Pedro yard currently employs some 2,200 people.

The West Coast's largest and busiest yard is **National Steel and Shipbuilding Company** in San Diego. In addition to its large volume of Navy repairs, overhauls, and major conversions, NASSCO has a contract from Exxon Shipping Company for construction of two 205,896-dwt VLCCs at a total cost of $250 million. The first of these tankers, the largest ships ever built on the West Coast, is scheduled for completion late this year and the second in March 1987.

Inland/Great Lakes Yards

Toledo Shipyard, the former AmShip yard in Ohio, recently received a $1-million contract to build a 600-passenger vessel for the Bob-Lo Island Amusement Park near Detroit. Last August, the yard was awarded a contract to build a 360-foot self-unloading cement barge for St. Mary's Holdings, Inc.

In Sturgeon Bay, Wisc., **Bay Shipbuilding Corporation** was winner of a prized contract to build three 16,130-dwt containerships for Sea-Land Industries at a cost of $180 million. All three keels have been laid; the first ship was launched in May this year and will be delivered in November.

The **Marinette Marine** yard in Marinette, Wisc., and **Peterson Builders** in Sturgeon Bay are both very busy with Navy new construction. **Fraser Shipyard** in Superior, Wisc., has long been involved in repairs and modernizations of big Great Lakes bulk carriers, and has converted many of these vessels to self-unloaders.

The idle **Upper Peninsula Shipbuilding Company** yard in Ontonagon, Mich., has been purchased by the Wedtech Corporation of The Bronx, N.Y. According to the new owner's management, they bought the yard to develop it as a small business venture to obtain government contracts.

The Outlook For U.S. Shipbuilding

Ideas for the revitalization of American merchant shipbuilding range from privatization of government-owned facilities (the eight Naval Shipyards and one Coast Guard yard) to the ever-surfacing cargo preference legislation.

Among the forecasters, a concensus seems to see a recovery beginning in 1987 followed by an upturn in 1989-90. The U.S. Maritime Administration's near-term outlook is that some further decline is expected in shipyard employment, although slight. This would be followed by a period of relatively stable work force requirements prior to the recovery expected to commence in late 1987. This outlook is contingent upon near-term economic conditions and future Administration and Congressional action with regard to continuation of the proposed Navy shipbuilding and conversion programs.

The Navy estimates that some 130,000 workers are needed in the nation's shipyards to meet the needs of a national emergency. The Shipbuilders Council of America, however, forecasts that it is possible only about 95,000 workers will be employed by 1990.

A plann proposed by Rep. **Helen D. Bentley** (R-MD) would restore construction subsidies to encourage the building of 20 merchant ships per year—as recommended in a recent Congressional Budget Office (CBO) report. Together with the ongoing Navy programs, it is felt that this would be enough to maintain the current industrial base.

"The annual production of 20 ships should maintain, over the long term, the sealift and shipyard capacity requirements," the CBO said. The study found that this would cost at least an additional $1 billion a year over the current annual maritime support costs of nearly $1 billion obligated under contracts before the present Administration came into office. ■

U.S. NAVY

STATUS OF NAVY SHIP PROCUREMENT

IMA provides a quarterly reporting service on Navy ship construction and maintenance programs. More than 300 companies now subscribe to IMA's quarterly service. This article describing the status of shipbuilding programs is based on excerpts from a recent quarterly report on Navy procurement. Information is current as of mid-May.

Submarines

Newport News informed the Navy it will likely bid on future Trident construction contracts. Until now GD-Electric Boat has been sole supplier of the Trident submarine. The Navy plans to buy 20 Tridents, 13 of which have already been contracted to GD-Electric Boat. Contracting is at the rate of one submarine per year. Program funding totaling $7.9 billion is planned over the next five years.

Newport News and GD-Electric Boat are building SSN-688 class attack submarines. Both are competing for lead position in the new attack submarine (SSN-21) program. Funding of $454 million has been requested for advance procurement in FY 1987 for the SSN-21. Lead ship procurement is scheduled in FY 1989. Over the next five years the Navy proposes to spend $5.3 billion on the SSN-21 program and $10.3 billion is planned to complete the SSN-688 program.

High priority has been given to improving U.S. antisubmarine warfare systems. The SSN-21 is said to be essential in order to counter improvements in Soviet submarine capability. The new submarine will be able to operate at higher speed, be quieter and dive deeper than the current SSN-688 class submarine. It will have advanced sensors able to search out enemy submarines. Navy says "new features of this submarine represent a quantum improvement over earlier designs."

Aegis Surface Combatants

Litton-Ingalls and Bath continue to build CG-47 class cruisers. A total force of 27 ships is planned. Four ships have been delivered, 15 are under contract. To complete the project, $7.5 billion has been programmed for 8 ships. Contracting is planned at the rate of two per year. This is a slight stretch-out of the program as originally planned.

Bath is in the detailed design phase of its contract to build the lead DDG-51. Fabrication of the lead ship is to begin in late March 1987; keel laying is scheduled for late December 1987; launch is planned in September 1988.

The Navy plans to issue the RFP for three follow DDG's in July. Todd, Litton-Ingalls and Bath will compete for the three ships in this solicitation package. A total DDG program of 29 ships is planned. Over the next five years the Navy has proposed a funding level of almost $14 billion for procurement of 17 DDG's.

Amphibious Ships

A multibillion-dollar contract for follow ships in the LHD-1 program is the principal procurement now taking place in this area. Last August the RFP for three ships was issued. Bidders submitted unpriced technical proposals to the Navy on February 28. Price proposals will be requested following completion of the technical evaluation. Contract award is scheduled this summer. The Navy has programmed $3.4 billion for this multiyear procurement over the next five years. Litton-Ingalls has the lead ship contract for LHD-1 and is obviously among the bidders for the follow ship contract.

The Navy has programmed $1.2 billion to procure a cargo version of the LSD-41. The new version (LSD-49) will be similar to the LSD-41, but be designed to carry fewer air cushion landing craft. Lockheed and Avondale are now building LSD ships. No schedule has been set for this new procurement.

Six TACS crane ship conversions are planned over the next three years. About $180 million is budgeted for this program. Bay Shipbuilding, Continental Maritime and Dillingham have been awarded contracts for the first three crane ship conversions. Bids for TACS 4-6 were submitted to the Maritime Administration (who is executing the work for the Navy) in May. The eleven yards submitting bids—and their prices—are shown in Exhibit 2.

MarAd expects to award a contract for a three ship TACS package in July. The apparent low bidder is Bethlehem-Sparrows Point. In second place is Norshipco—with an apparent low bid about $8,000 under Dillingham. These prices include the cost of the cranes.

Exhibit 2
Bids on TACS 4-6 Conversion

Shipyard	Bid Price (millions of $)
Alabama Drydock	$52.76
Bay Shipbuilding	50.52
Bethlehem-Sp. Pt.	41.24
Dillingham	46.97
Fraser	65.96
Houston Ship Repair	54.93
Jacksonville	95.66
Norshipco	46.96
Tampa	47.70
Todd-Galveston	55.26
Todd-San Francisco	59.55

Source: NAVSEA

Support Ships

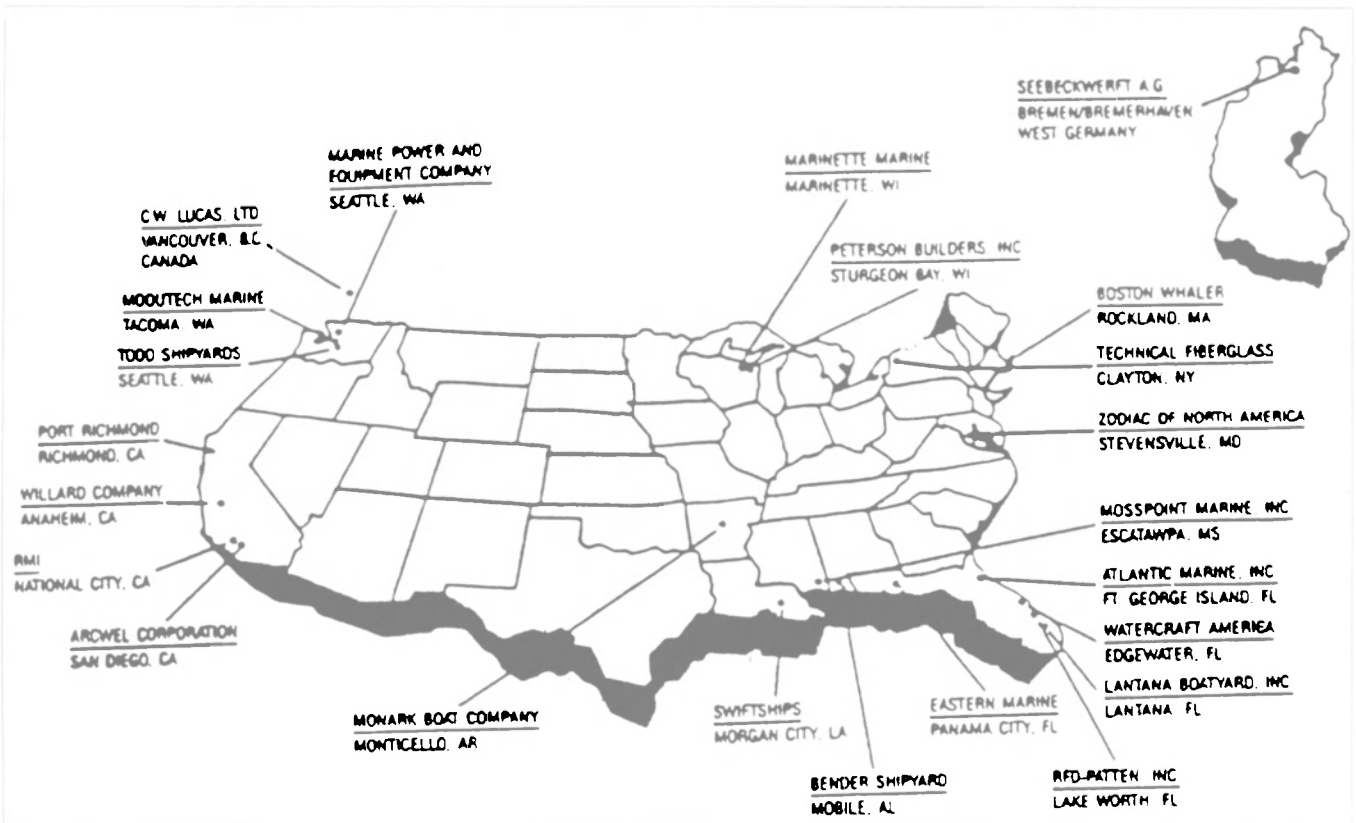
Approximately 10 percent of planned SCN funding over the next five years is earmarked for support ship procurement. Here's the status and our assessment of future developments in each program.

• **TAO**-187—Nine ships are now on order: six at Avondale, three at Penn Ship. The first ship is to be sent on sea trials within the next few weeks. To date, aside from minor issues with the PTO generator and UNREP equipment placement, there have been few problems in this program. The Navy's objective is to build 19 of this class of ship. The remaining program will be open to competition. Alternative engines will be considered in the next flight of TAO's.

• **TAGOS** (conventional)—The Navy has negotiated with Tacoma Boat to complete ships 9 and 10 in this trouble-plagued program. The remaining two ships in the 12 ship package to Tacoma will be recompeted. Hardware bought by Tacoma for ships 11 and 12 will be specified as GFM in the bid package. Award of ships 11 and 12 to a new builder is planned for mid-1987. Ships 13-18 are under contract to Halter Marine.

• **TAGOS (SWATH)**—An RFP package was sent to prospective builders on May 5. The competition is open to all shipyards. Each of the ten yards participating in the design competition are supposed to earn extra evaluation points. Award will be in September. Starting FY 1988 all TAGOS ships will be SWATH design. The Navy plans to build a force of 26 TAGOS, nine of which will be SWATH design.

• **AE**—The Navy has placed on



hold its plan to build the lead AE in FY 1988. Preliminary design has been completed; final design was to start in April. The program has been shifted outward due to budget constraints. Final design is to be done by NAVSEA with shipyard input similar to the method used in the TAGOS-SWATH design.

- **AOE**—Contract design was completed and signed off in February. RFP is due to be issued soon, with contract award planned for November. The contract will likely be for four ships—one with an option for three more.
- **ARS**—One ship is in the five year plan for FY 1991. This is very uncertain. No design work on this ship has begun.
- **AGOR/AGX**—The Navy has accorded priority to improving its oceanographic and coastal survey capability. These ships will get high priority. It is understood that an increased number of AGOR/AGX ships is now being considered in the FY 1988 programming process. The lead ship (AGOR-23) is planned for FY 1987. It will replace a university operated oceanographic ship. A COR with cost constraint will be used in the procurement. The procedure will be similar to the procurement method used for the MSH.
- **AO** (lengthening)—NAVSEA expects to complete the contract design by December. Award of the lengthening contract is planned in May 1987. No decision has yet been made as to whether individual contracts will be awarded, or all five ships will be made part of one bid package.

Minesweepers

Five mine countermeasures (MCM) ships are under contract: three at Peterson builders, two at Marinette Marine. Nine ships remain to be contracted over the next two years. The initial ship in the program is scheduled for delivery in October 1986.

Bell Aerospace Textron is under contract to build the lead minesweeper hunter (MSH). The contract includes options for eight additional ships. A total force of 17 MSH's is planned. The remaining eight ships will be competitively awarded in FY 1988 and 1989. Delivery of the lead MSH has been delayed seven months, with delivery now scheduled for February 1988.

The MSH is the result of an industry design competition. Bell's successful proposal is a surface effect design based on Swedish technology. It is a glass reinforced plastic hull. According to NAVSEA, "these unique features and the mine warfare ship requirements of low magnetic permeability, shock hardness and noise attenuation have complicated the design process for Bell and resulted in higher shipbuilder's engineering cost and a delay in construction and delivery of the lead ship."

Small Naval Craft and Drydocks

NAVSEA has outstanding contracts to acquire about 1,000 small craft and two drydocks. These contracts total to about $265 million. Exhibit 3 gives the details.

During FY 1986 and 1987, the Navy plans to solicit bids for over 300 boats and small naval craft. The planned procurements are listed in Exhibit 4. Not included in the listing are craft—and one drydock—funded in FY 1986 that have already been contracted or for which bids have been received. A cautionary note is that budget constraints will likely cause change in the FY 1987 program.

All but the SWCM, sail training craft and rigid inflatable boats will be contracts set aside for small businesses. Payment and performance bonds will be required on all contracts.

Ship Operating Contracts

An RFP was reissued in April for operation of five cable ships. Bids are due on July 25. This is an A-76 comparative solicitation—where commercial bids will be compared to operating costs under civil service manning. Award will be made to the low bidder if the commercial bid will result in savings.

The RFP for contract operation of two hospital ships and the sub-

(continued)

U.S. NAVY

(continued)

mergence support ship Point Loma was withdrawn in May. A decision was made to include these ships in the MSC A-76 study. The RFP will be reissued at a date not yet determined.

RFP's to operate four range instrument ships and seven ocean tugs will also be issued as part of the A-76 study. The dates for release of the RFP's has not been set.

In mid-1987 the operating contract for the first four SL-7's will expire. SeaLand has this contract. Competitive bids will be solicited for the next operating period.

Merchant Ship Revolving Fund

Hearings were held in February to consider authorization of a program to build cargo ships configured for military sealift mission. Last December $852 million was earmarked for this use in the FY 1986 defense funding continuing resolution. Authorization of the program is required before the funds can be used. Further appropriations committee hearings in House and Senate are also planned should the authorizing legislation be passed.

In March Mr. **Pyatt** appeared before a House Armed Services subcommittee and stated Navy's opposition to the proposed legislation. Industry representatives supported passage of the bill.

House subcommittee mark-up of the proposed legislation was completed on May 8. The closed session results were not known at time of publication.

The outcome is entirely dependent on whether sufficient political force can be mustered to push this legislation through Congress despite the Administration's opposition.

Exhibit 4
Small Craft Procurements Planned In FY 1986 and FY 1987

Number of Units	Description	
FY 1986: (not yet awarded)		
15-20	56′ target boat, with options	invitation to bid due to be issued in May
15-20	50′ workboat with options	
FY 1987:		
150	14′ punt (GSA purchase)	
30	18′ utility boat (GSA purchase)	
20-25	22′ utility boat (GSA purchase)	
15	26′ motor whaleboat, with options for FY 1988, FY 1989	
11	32′ personnel boat with small option for FY 1988	
10	33′ utility boat with option for five in FY 1988	
10	40′ personnel boat, with option for 11 in FY 1988	
2	fuel oil barge (YON)	
1	support barge for Charleston (Kings Bay), essentially a housing barge	
1	torpedo tester (YTT); 1200 ton, 200′ long craft to support torpedo range; option for one additional unit in FY 1988	
2	4000 shp tugs for Army; 110-113′ long; option for unspecified number over two year period	
12	44′ sail training sloops for Annapolis with options for 24 additional craft in FY 1988 and 1989	
1	special warfare craft (SWCM); 19 units planned to complete program; RMI has lead contract, but Navy wants to develop second source	
16	110′ USCG patrol boat; this is second flight of these vessels; Bollinger has first flight of 16 under contract	
15	rigid inflatable sidewall boats, diesel powered; options for future years	
?	FMS patrol boats; number depends on decision of foreign buyers; NAVSEA now buying 18-19 boats under FMS program; these are sole source procurements where the foreign buyer selects and specifies the building yard	
3	floating cranes (YD)	

Source: NAVSEA

Exhibit 3 Small Naval Craft And Drydocks On Order As Of March 1986

Craft	Quantity	Contractor	Value (000's of $)
18′ Target boat TB	24	Arcwel Corp.	$ 880
18′ Utility boat (UB)/Boom Tender	85	Arcwel Corp.	990
68′ Seaspectre (PB) (MK4)	3	Atlantic Marine	4,155
LCM-6	2	Bender	1,248
74′ Landing craft mechanized (LCM-8)	4	Bender	2,895
18′ UB	10	Boston Whaler	93
22′ UB	37	Boston Whaler	961
Covered lighter (YFN)	7	Eastern Marine	3,311
36′ Patrol boat	4	Lantana Boatyard (FMS)	720
Landing craft mechanized (LCM-8)	28	Marine Power	13,278
120′ Torpedo weapon retriever (TWR)	10	Marinette Marine	25,570
Patrol craft (YP)	20	Marinette Marine	71,319
40′ Personnel boat (PE) (MK 5)	7	Modutech Marine	1,540
14′ Punt	192	Monark Boats	89
24′ Boom handling (BH)	4	Monark Boats	349
24′ Explosive ordnance disposal (EOD) boat	43	Monark Boats	2,436
26′ Personnel boat (PE)	42	Monark Boats	3,195
33′ Utility boat (UB)	6	Monark Boats	656
35′ Workboat (WB)	3	Monark Boats	647
40′ Parasail training craft	7	Monark Boats	1,790
42′ Plane personnel rescue boat (PR) (MK 4)	6	Monark Boats	3,152
Landing craft utility (LCU)	2	Moss Point Marine	8,642
Open lighter (YC)	26	Moss Point Marine	6,586
Patrol craft (YP)	7	Peterson Builders	21,344
33′ Personnel boat (PE)	13	Port Richmond	1,469
Combat rubber raiding craft CRRC(S)	145	RFD Patten, Inc.	450
82′ Sea Viking (SWCM)	1	RMI	4,427
Med/aux floating drydock (AFDB-8)	1	Seebeckwerft A.G.	22,610
34′ Patrol boat (PB)	2	Swiftships (FMS)	591
26′ Motor whaleboat (MW)	43	Technical Fiberglass	1,694
Med/aux repair drydock (ARDM-5)	1	Todd, Pacific Shipyard	32,714
36′ Landing craft personnel large (LCPL)	112	Watercraft America	13,712
56′ Target boat (TB)	17	Watercraft America	2,948
33′ Personnel boat (PE) (MK 5)	17	Willard Company	2,309
40′ Personnel boat (PE) (MK 5)	22	Willard Company	3,175
40′ Utility boat (UB)	23	Willard Company	2,172
50′ Utility boat (UB)	12	Willard Company	2,024
Zodiac inflatable craft model F-470	10	Zodiac of North America	49
Total	**998**		**$266,570**

Put your fleet on your desk . . . with the Sperry MCS 2 series Satellite Communicators

Sperry brings you shoreside management of your vessels, 24 hours a day, anywhere on earth!

The new Sperry MCS 2 series of satellite communicators truly puts your fleet on your desk. Immediately. With complete, accurate, private data exchange between your valuable assets afloat and your managerial data base ashore.

Sperry enables you to monitor vessel performance from ashore, to report inventories and cargo loadings to management, to beat the competition in responding to chartering opportunities.

The Sperry MCS 2A and MCS 2B are uniquely suited to bring you fast, reliable, complete communication between your desk and your fleet. The MCS 2A offers cost-effective message and data transmission, with provision for interface to remote phones, fax machines, computer modems. The MCS 2B provides a full-color, full-function, marine environment ruggedized personal computer to put today's technology to work for you.

What's more, no other marine supplier can provide you with the expertise Sperry offers in computers, communications, guidance and navigation. A computer industry pioneer, Sperry has more than 75 years of marine experience.

So, look to Sperry MCS 2 Satellite Communicators . . . when you need reliable, instantaneous, and secure communications between ship and shore. Put your fleet on your desk. Contact Sperry Corporation, Charlottesville, VA 22906. Attn: Marketing Department. Phone: (804) 973-0100.

SPERRY

Circle 248 on Reader Service Card

NAVY

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

SHIPYARD / NAVY NUMBER	NAME	APPROX. CONTRACT $	CONTRACT DEL'Y DATE
Atlantic Marine			
MK IV patrol boats (3)	unnamed	4,155,500	NA
Avondale Industries			
T-AO-187	Henry J. Kaiser	123,900,000	9/86
T-AO-188	Joshua Humphreys	117,000,000	12/86
T-AO-189	unnamed	116,000,000	5/87
T-AO-190	unnamed	116,000,000	9/87
T-AO-193	unnamed	116,000,000	8/88
T-AO-195	unnamed	101,000,000	1/89
LSD-44	unnamed	166,000,000	7/88
LSD-45-46	unnamed (2)	306,800,000	88-89
LSD-47-48	unnamed (2)	300,000,000	89-90
Bath Iron Works			
FFG-59	Kauffman	89,300,000	10/86
CG-51	Thomas S. Gates	305,300,000	1/87
CG-58	unnamed	252,800,000	6/88
CG-60-61	unnamed (2)	383,600,000	89
CG-63-64	unnamed (2)	386,600,000	NA
DDG-51	Arleigh Burke	321,900,000	2/89
Bell Aeorspace			
LCAC-7-12	unnamed (6)	102,000,000	NA
LCAC-13-24	unnamed (12)	197,000,000	NA
Bender Shipbuilding			
LCM-8 type	unnamed (4)	3,000,000[3]	—
Bethlehem-Sparrows Point			
T-AGS-39-40	unnamed (2)	132,000,000	87-88
Boleing Marine			
APH	unnamed	6,900,000[1]	6/87
Patrol boats (Thailand-2)	unnamed	112,000,000	—
Bollinger Shipyard			
WPB-1308	Vashon	5,000,000	86
WPB1309	Aquidneck	5,000,000	87
WPB-1310	Mustang	5,000,000	87
WPB-1311	Naushon	5,000,000	87
WPB-1312	Sanibel	5,000,000	87
WPB-1313	Ebisto	5,000,000	87
WPB-1314	Sepelo	5,000,000	—
WPB-1315	Matinicus	5,000,000	—
WPB-1316	Nantucket	5,000,000	—
Robert E. Derecktor			
WMEC-906	Seneca	37,700,000	6/86
WMEC-907	Escanaba	37,700,000	86
WMEC-908	Tahoma	37,700,000	—
WMEC-909	Campbell	30,160,000	—
WMEC-910	Thetis	30,160,000	—
WMEC-911	Forward	30,160,000	—
WMEC-912	Legare	30,160,000	—
WMEC-913	Mohawk	30,160,000	—
General Dynamics/Electric Boat			
SSN-724	unnamed	70,121,000	5/87
SSN-725	unnamed	70,121,000	10/87
SSN-751-2	unnamed (2)	560,200,000	88
SSN-754-5	unnamed (2)	649,000,000	—
SSN-21	unnamed	28,900,000[2]	—
SSBN-733	Nevada	401,000,000	10/87
SSBN-734	unnamed	523,700,000	88
SSBN-735	unnamed	531,600,000	89
SSBN-736	unnamed	500,870,000	90
SSBN-737	unnamed	616,400,000	90
SSBN-738	unnamed	674,100,000	12/91
SSN-760-63	unnamed	1,032,667,000	2/91
Halter Marine			
T-AGOS-13-14	unnamed (2)	28,500,000	88
Litton/Ingalls			
CG-52	Bunker Hill	332,000,000	7/86
CG-53	Mobile Bay	332,000,000	2/87
CG-54-56	unnamed (3)	926,100,000	87-88
CG-57, 59	unnamed (2)	325,500,000	88
CG-62	unnamed	238,600,000	89
CG-65	unnamed	242,600,000	90
LHD-1	Wasp	1,365,700,000	3/89
LHD-2	unnamed	38,877,000[2]	—
Lockheed-Gulfport			
LCAC	unnamed (2)	24,800,000	88
Lockheed-Seattle			
LSD-43	Fort McHenry	271,500,000	6/87
Marinette Marine			
MCM-2	Defender	46,000,000	8/86
MCM-4	Champion	42,000,000	—
TWR	unnamed (5)	13,000,000	86
YP Yard Patrol Craft	unnamed (20)	59,700,000	86-87
Moss Point Marine			
LCU	unnamed (2)	8,600,000	9/86
Norfolk Shipbuilding			
Logistic Support	(Army-4)	80,000,000	89
Newport News Shipbuilding			
CVN-71	Theodore Roosevelt	1,300,000,000	9/86
CVN-72	Abraham Lincoln	1,550,000,000	12/89
CVN-63	George Washington	1,550,000,000	12/91
SSN-721	Chicago	225,000,000	6/86
SSN-722	Key West	225,000,000	6/87
SSN-723	Oklahoma City	225,000,000	87
SSN-750	Newport News	278,000,000	87
SSN-753	unnamed	319,000,000	88
SSN-756,8-9	unnamed (3)	779,500,000	89-90
SSN-21	unnamed	28,900,000[2]	—
Pennsylvania Shipbuilding			
T-AO-191-2	unnamed (2)	222,000,000	89
T-AO-194	unnamed	97,500,000	90
Peterson Builders			
ARS-52	Salvor	70,000,000	86
ARS-53	Grapple	33,900,000	87
MCM-1	Avenger	64,400,000	86
MCM-3	Sentry	57,900,000	87
MCM-5	unnamed	57,900,000	88
RMI, Inc.			
SWCM	unnamed	11,250,000	—
Tacoma Boatbuilding			
T-AGOS-9	Assertive	12,500,000	86
T-AGOS-10	Invincible	12,500,000	86
T-AGOS-11	Dauntless	12,500,000	87
T-AGOS-12	Vigorous	12,500,000	87
Missile ships (2-Indonesia)	unnamed	143,000,000	—
Todd Pacific-San Pedro			
FFG-60	R.M. Davis	89,900,000	10/86
FFG-61	unnamed	96,100,000	11/88
Todd Pacific-Seattle			
ARDM	Arco	32,700,000	—

Legend: 1—long-lead procurement; 2—design contract; 3—under subcontract from Twin City Shipyard

Introducing DE-MAR® XT. High TBN protection in a fuel-saving diesel oil.

New DE-MAR XT. Exxon's highest rated zinc-free engine oil for inland water workboats.

Its 13 TBN means extra protection to neutralize acids that cause harmful crankcase deposits. DE-MAR XT oil will help your engines run cleaner, longer—even under the toughest conditions. And Exxon's proprietary friction-reducing additives help you save fuel.

DE-MAR XT oil meets the tough performance standards of leading marine main propulsion engines, including EMD, General Electric, Fairbanks-Morse, Alco and Caterpillar 3600 series.

And you can use the same oil for your auxiliary engines as well.

Put DE-MAR XT to work in your engine today, and we'll put the computerized EXXGARD™ Oil Analysis Program to work tracking your engine's performance. We'll analyze four samples per main engine per year. Free.

To find out how you can have the tough protection of new DE-MAR XT marine engine oil, call this toll-free number: 1-800-44EXXON. Or fill out the coupon and mail it back to us.

EXXON

Quality you can count on.

Please send me information on:

___ New DE-MAR XT marine oil.

___ Free EXXGARD Oil Analysis Offer.

Name

Title

Company

Address

City State Zip

( )
Phone

MR

MAIL TO: Exxon Company, U.S.A.
Room 2323AH, Box 2180
Houston, Texas 77252-2180

Circle 112 on Reader Service Card

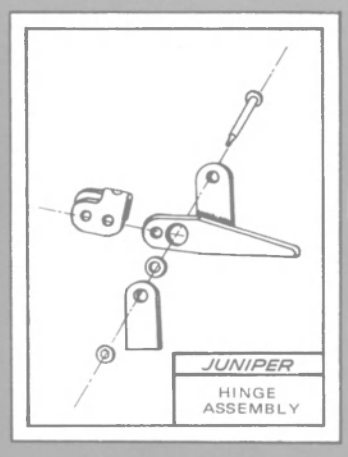
U.S. NAVY

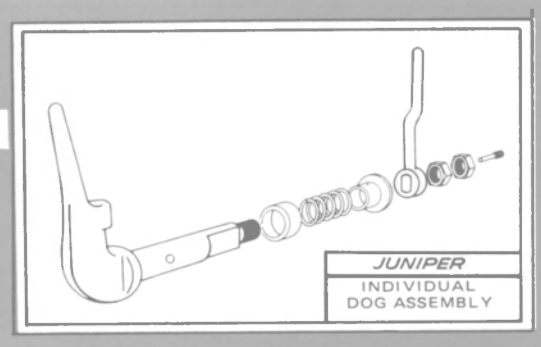
CURRENT NAVY, COAST GUARD & MARAD OVERHAUL, MAINTENANCE & CONVERSION CONTRACTS AT U.S. YARDS

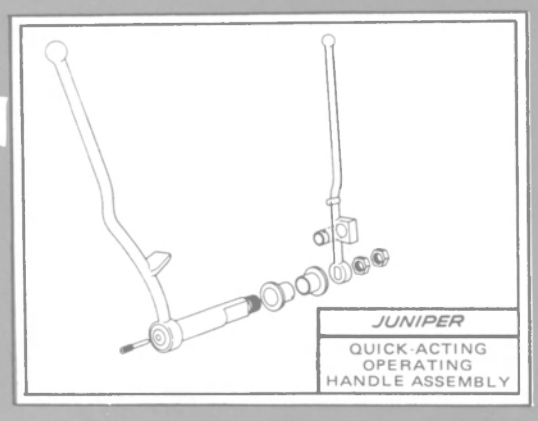
SHIPYARD	TYPE OF WORK	$VALUE	COMP
Bath Iron Works	Overhaul 4 USCG cutters	117,452,000	-89
Bath-Portland	Overhaul DDs Deyo & O'Bannon	44,600,000	86-87
Bender Shipbuilding	Convert CofE dredge to diesel	3,200,000	6/86
Braswell Shipyards	Maint. on USS Los Alamos (AFDB-7)	3,075,912	8/86
Coastal Drydock	Overhaul USS Shreveport (LPD-12)	10,500,000	6/86
Charleston Naval Shipyard	Overhaul USS Calhoun (SSBN-630)	—	8/86
	Overhaul USS Jackson (SSBN-634)	—	8/87
	Overhaul USS Sturgeon (SSN-637)	—	9/86
Dillingham Ship Repair	Convert ex-President Polk to craneship	20,500,000	9/86
Electric Boat	Phased maintenance on SSBN-731-3	4,000,000	4/87
General Ship	Maintenance on USS Miller (FF-1091) and USS Valdez (FF-1096)	46,475,000	—
Honolulu Shipyard	Repairs on USS Jason (AR-8)	3,997,504	7/86
	Repairs to USS McInerney (FFG-8)	8,000,000	2/87
Ingalls Shipbuilding	Overhaul USS Simon Lake (AS-33)	15,900,000	7/86
Jonathan	Phased maintenance on USS Saganaw	9,900,000	6/90
Long Beach Naval Shipyard	Modernize battleship Missouri (BB-63)	500,000,000	86
	Overhaul USS CLeveland (LPD-7)	—	1/87
	Overhaul USS Schofield (FFG-3)	—	11/86
Mare Island Navy Yard	Overhaul USS Haddock (SSN-621)	—	5/86
	Overhaul USS Hammerhead (SSN-663)	—	9/86
National Steel	Convert two tankers to hospital ships	336,200,000	86-87
	Phased maintenance on four LSTs	3,500,000	-90
	Overhaul USS Tripoli (LPH-10)	12,835,000	5/86
	Overhaul USS Merrill (DD-976)	6,039,000	—
	Overhaul USS Horne (CG-30)	—	—
	Overhaul USS Leahy (CG-16)	—	—
	Maintenance on three LSTs	5,858,543	—
Newport News Shipbuilding	Overhaul USS Daniel Boone (SSBN-629)	12,800,000	8/86
	Overhaul & refuel USS Benjamin Franklin (SSBN-640)	17,063,000	1/87
	Overhaul USS Eisenhower (CVN-69)	276,600,000	1/87
	Prep for overhaul USS George Bancroft (SSBN-643)	19,400,000	3/88
	Prep for overhaul USS Enterprise (CVN-65)	3,075,912	8/86
Norfolk Navy Yard	Overhaul USS Yarnall (CG-17)	—	6/86
	Overhaul USS Nassau (LHA-4)	—	9/86
	Overhaul USS Memphis (SSN-691)	—	9/86
Norfolk Shipbuilding	Phased maint. on AO-178, 179, 186	38,900,000	—
	Overhaul USS Caloosahatchee (AO-98)	3,478,000	—
Northwest Marine	Overhaul USS Iwo Jima (LPH-2)	16,167,222	2/87
	Overhaul USS Cushing (DD-985)	12,300,000	7/86
	Overhaul USS Deluth (LPD-6)	12,282,000	6/86
	Overhaul USCGC Storis (WMEC-38)	4,225,000	6/86
Pearl Harbor Navy Yard	Overhaul USS Skate (SSN-578)	—	6/86
	Overhaul USS Omaha (SSN-692)	—	6/86
Pennsylvania Shipbuilding	Phased maint. on USS Patterson (FF-1061)	5-10 mil/yr	—
	Maint. on USS Oliver Hazard Perry (FFG-7)	4,861,747	7/86
Philadelphia Navy Yard	SLEP on Forrestal & Independence	480,000,000	—
	Modernization of Wisconsin (BB-64)	469,000,000	87
Portsmouth Navy Yard	Overhaul USS Bolivar (SSBN-641)	—	12/86
	Overhaul USS Greenling (SSN-614)	—	7/86
	Overhaul USS James K. Polk (SSBN-645)	135,000,000	87
Puget Sound Navy Yard	Overhaul USS Ranger (CV-61)	—	6/86
	Overhaul USS Texas (CGN-39)	—	12/86
	Repair & overhaul USS Nimitz (CVN-68)	—	89
Service Engineering	Overhaul USNS Spica (T-AFS-9)	10,700,000	—
	Phased maint. on AE-29, 32-34	4,154,000	86-89
Southwest Marine	Overhaul USS Dubuque (LPD-8)	10,000,000	—
	Repairs to USS Kansas (AOR-3) and Wichita (AOR-1)	41,600,000	—
	SRN on 4 16/26 class ships	—	—
	Overhaul USS Cayuga (LST-1186), USS Racine (LST-1191) and USS Schenectady (LST-1185)	35,000,000	87-89
Todd-Galveston	Convert two C-5s to T-AVBs	55,000,000	86-87
Todd-San Pedro	Maintenance on USS Vincennes (CG-49)	3,750,000	—
	Overhaul USS Ingersoll (DD-652)	13,500,000	12/86
Todd-Seattle	Phased maintenance on AOEs	6,000,000	86-90
	Overhaul eight USCG cutters	234,903,000	-90
USCG Yard-Curtis Bay	SLEP for 14 buoy tenders	8,500,000	—
	Major maintenance on 16 WMECs	—	—

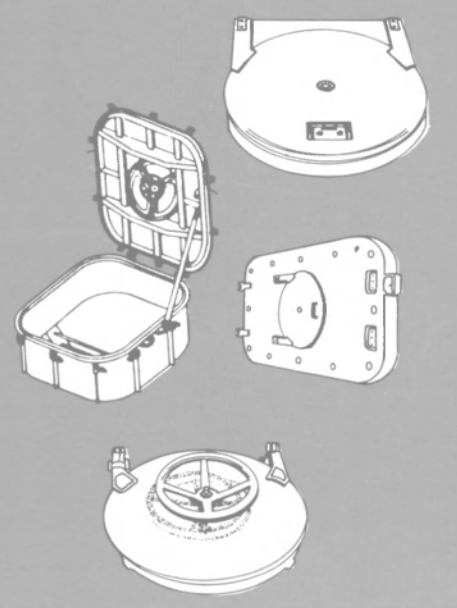
JUNIPER

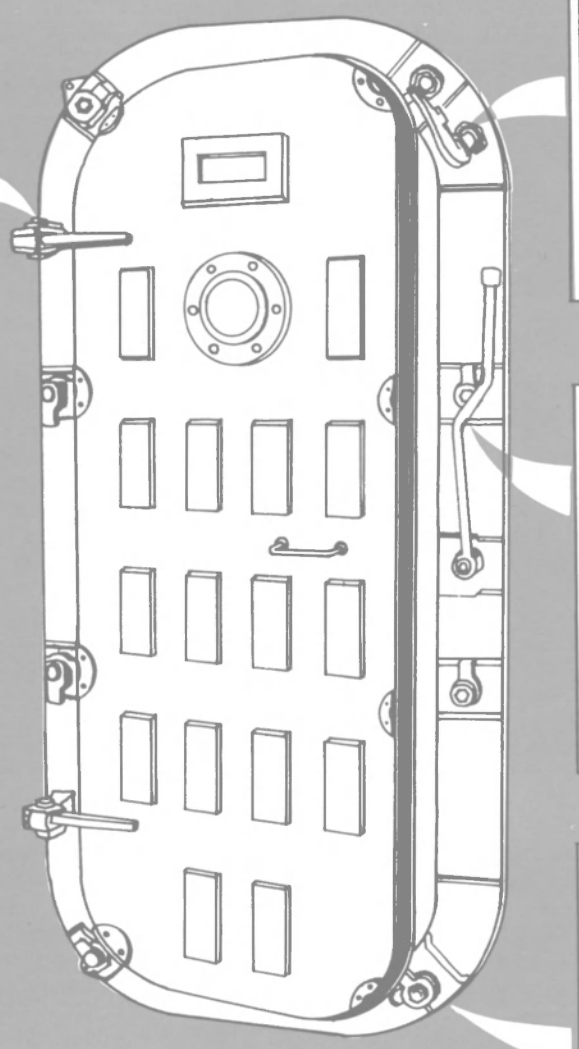
loves it when a plan comes together...

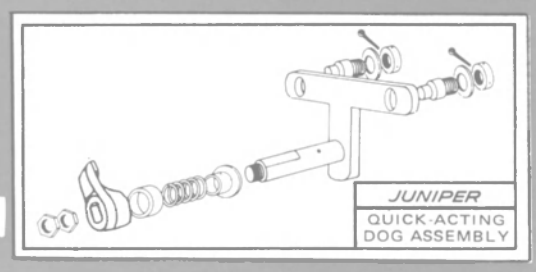












Largest inventory in the country –

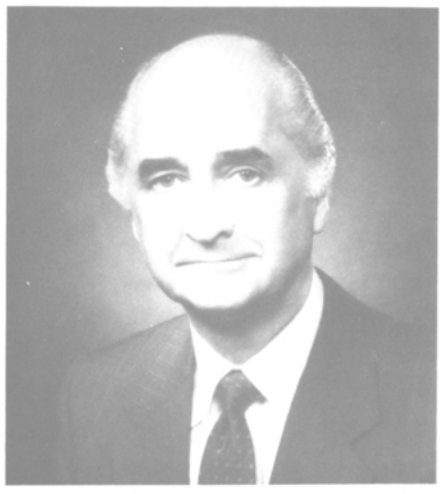
From individual components to completely assembled Navy Standard doors, hatches and scuttles.

■ dogging assemblies ■ hinge assemblies ■ drop bolt assemblies ■ bushings
■ springs ■ packing plungers ■ studs ■ handwheels ■ spindles
■ ballistic parts ■ wedges ■ gaskets ■ con rods & collars

JUNIPER INDUSTRIES INC.

72-17 Metropolitan Ave., Middle Village, N.Y. 11379
Telephone: **800-221-4664** Telex: **12-5141**

U.S. MERCHANT SHIPBUILDING



M. Lee Rice

U.S. SHIPBUILDING OUTLOOK
Maritime Policy—1980-1985

By M. Lee Rice, President
Shipbuilders Council of America

Editor's note: The following report is reprinted from the 1985 Annual Report of the Shipbuilders Council of America that was released in April, 1986.

When the Administration assumed office in 1981, the shipbuilding industry understood that it would be challenged to meet the performance and cost objectives of an expanded naval construction program. Further, the shipbuilding industry knew that performing the backlog of commercial and Navy work, on hand in 1981, would demonstrate that the industry's ongoing investment in facilities and new production methods and processes provided lower shipbuilding costs and more rapid shop deliveries. The industry was poised to build badly needed new navel vessels and to respond to all requirements to build commercial vessels.

That the Administration placed highest shipbuilding priority on naval combatant vessels in its 1981 and 1982 budgets was understood and strongly supported by the industry. The industry did not agree, however, that the series of decisions that resulted in the near abandonment of commercial domestic shipbuilding were based on sound analyses of the requirements of national security. In our view, it is a responsibility of industry to highlight errors or misjudgments in national policy development when they occur.

As indicated in the Message from the Chairman (following this article), we believe that our industry has acted responsibly and effectively to the demands of a changing business environment and that the Administration has made good progress in enhancing our naval war fighting capabilities at costs that are fiscally sound.

Today, however, the status of the overall maritime capability of the nation is much less sound than that of the Navy. During the Presidential campaign in 1980, then-candidate **Ronald Reagan** issued a statement entitled "A Program for the Development of an Effective Maritime Strategy." The President's statement included the following definitive program:

"We must develop and undertake a maritime policy that will (1) demonstrate our understanding of the importance of the seas to America's future; (2) reestablish the U.S.-flag commercial fleet as an effective economic instrument capable of supporting U.S. interests abroad; and (3) demonstrate America's control of the seas in the face of any challenges.

"A specific naval-maritime program must be developed that will:

"1. Provide a unified direction for all government programs affecting maritime interests of the United States. We must insure that there is active cooperation between the Navy and the Merchant Marine and the government departments responsible for each. We must see that long-range building programs for naval and merchant ships are established and carried out without falling victim to petty bureaucratic jealousy. This is the role of the President, and I shall see that our maritime policy is coordinated to insure that it achieves the objectives we set for it.

"2. Insure that our vital shipbuilding mobilization base is preserved. It is essential that sufficient naval and commercial shipbuilding be undertaken to maintain the irreplaceable shipbuilding mobilization base. Without this nucleus of trained workers and established production facilities, we can never hope to meet any future challenge to our security.

"3. Improve utilization of our military resources by increasing commercial participation in support functions. The Navy today is facing a critical shortage of trained personnel. With the commercial industry assuming increased responsibility for many auxiliary functions, substantial cost savings can be achieved and a large reserve of manpower can be released to provide crews for a growing naval fleet. This is an example of the means by which we can increase defense mobilization without adding burden to the taxpayer.

"4. Recognize the challenges created by cargo policies of other nations. The United States has traditionally espoused free trade. However, the international shipping trade is laced with a network of foreign governmental preferences and priorities designed to strengthen foreign fleets, often at the expense of U.S. maritime interests. We must be prepared to respond constructively for our own interests to the restrictive shipping policies of other nations. A major goal of the United States must be to insure that American-flag ships carry an equitable portion of our trade consistent with the legitimate aspirations and policies of our trading partners.

"5. Restore the cost competitiveness of the U.S.-flag operators in the international marketplace. It has been American policy since 1936 for the additional costs of building and operating U.S.-flag ships to be borne by a system of subsidies to help insure the competitiveness of American importers and exporters. But our parity system failed in the mid-1970s because most foreign governments moved to protect their own vital maritime interests after the shipping collapse of the mid-1970s. We must now take corrective action to make certain our merchant fleet and our shipbuilding industry survive and grow.

"6. Revitalize our domestic water transportation system. The inland water transportation system provides an economic and energy-efficient method of moving goods and commodities of the nation between all parts of our country. It also provides a vital link in our international trading effort by tying the ports of our four seacoasts, which includes our Great Lakes, to the producing heartland of the nation. Again we are paying a high price for the absence of any coherent national policy.

"7. Reduce the severe regulatory environment that inhibits American competitiveness. As foreign competition on the maritime scene has increased, so have the operational and regulatory restrictions on U.S. shipping and shipbuilding. Many of these restrictions increase costs and, in some cases, simply prevent our ships from competing with foreign ships. There is rarely, if ever, any commensurate benefit from these restrictions. Accordingly, we will carefully and rapidly review the effect of these restrictions, and sponsor appropriate actions.

"In carrying out these expansive programs, a coordinated effort will be undertaken to create new jobs for American seamen, shipyard workers, and the thousands of workers in related industries. These maritime industries, which are vital to our national well-being, in the past have had an outstanding record of providing not only employment but the training to enable minorities and the disadvantaged to obtain continued advancement.

"This seven-point program will be carefully developed and it will be carried out. We cannot expect others—either allies or adversaries—to respect our interests if we show no respect or concern for them ourselves. The failure to develop and carry out an effective naval and maritime program will deny the use of the seas to the United States and eventually, to the Free World."

Is the seven-point program in place and functioning? To deny that

nothing has been done would be incorrect. A major naval shipbuilding program has been undertaken, as was indicated, and civilian manning of naval vessels has increased. But what of the promised enhancement of the merchant fleet and the shipbuilding industry? Has sufficient progress been made? It has not in the view of the Congress.

As also indicated in the Message from the Chairman, Congress enacted on October 19, 1984, Public Law 98-525, the Department of Defense Authorization Act, 1985, legislation that created a Commission on Merchant Marine and Defense to study the problems of the maritime industry. The defined tasks of the Commission are as follows:

"The Commission shall study problems relating to transportation of cargo and personnel for national defense purposes in time of war and national emergency, the capability of the United States merchant marine to meet the need for such transportation, and the adequacy of the shipbuilding mobilization base of the United States to meet the needs of naval and merchant ship construction in time of war or national emergency. Based on the results of the study, the Commission shall make such specific recommendations, including recommendations for legislative actions, action by the executive branch, and action by the private sector, as the Commission considers appropriate to foster and maintain a United States merchant marine capable of meeting national security requirements. The recommendations of the Commission shall be provided in the reports of the Commission due on September 30, 1985, and September 30, 1986 . . ."

Following enactment of the legislation, the Office of Management and Budget held that no Commission could be created without specific funding. On August 15, 1985, the Congress provided funding for the Commission as part of the supplemental appropriations for Fiscal Year 1985. Yet, five months later the Administration has failed to name Commissioners and create the Commission.

Should it therefore be concluded that the Administration believes that it has fulfilled either the mandate of the Congress in defining the tasks to be performed by the Commission or that the seven-point program defined by the President in 1980 has been put in place?

As we have previously stated, the program of the Administration has been to enact the Shipping Act of 1984 as the centerpiece of maritime legislation and to continue to seek enactment of foreign building privileges for ship operators with operating-differential subsidy contracts, the elimination of ad valorem duties levied on foreign repair of U.S.-flag vessels, and the immediate eligibility of foreign-built, U.S.-flag vessels to carry preference cargoes. All legislation designed to provide support for the shipbuilding industry has been consistently opposed, including "Build and Charter."

Further, the implementation of the construction differential subsidy payback, proposed tax legislation and actions by the Department of Agriculture to deny the applicability of certain cargo preference laws to agricultural products together show that there is no centralized review of maritime policy that requires the policy development be measured as to its effect on national security.

Recently, maritime industry experts compiled data relating to the current status of the industry and attempted to look forward to 1990. This was done for the U.S. liner fleet, both international and domestic trading; the U.S.-flag tanker fleet, both international and domestic trading; and the Effective U.S. Control fleet (EUSC). In each case and particularly vessels classed as militarily useful, the fleet has contracted sharply in numbers of vessels in the period from 1980 to 1985. For example, the total number of liner vessels was reduced from 319 in 1980 to 209 in 1985. Comparable decline has occurred in the U.S.-flag militarily useful tanker vessels, where useful vessels now include those less than 100,000 dwt. Further, more than one-half of these vessels are engaged in the carriage of crude oil (a transport that must be sustained in a national emergency) and a substantial number of the vessels over 50,000 dwt are not suitable for transport of clean products due to lack of cargo tank coatings

(continued)

U.S. MERCHANT SHIPBUILDING

(continued)

even if they can be replaced in the service by substitute foreign-flag vessels.

It has always been recognized that the primary value provided by the EUSC fleet to the nation in a national emergency was to provide shipping support for the general economy. Again, sharp declines have occurred in this fleet both in militarily useful vessels and the fleet overall during the period since 1980.

Looking forward to 1990, these shipping experts agreed that the most likely change to the fleets would be reduction in size, certainly as measured by number of vessels. The real issue that lies before the nation is how severe the contraction of the operating fleets will be in this period. Further, it was agreed that because of the lack of a complete and coherent maritime policy and strategy, particularly in regard to a *stable policy,* it is impossible to predict the fleet composition with reasonable accuracy. For example, the proposed new tax law will undoubtedly cause severe changes to the future fleets. Thus, the problem of planning for military contingencies becomes extremely difficult and highly speculative.

Rarely in military planning is the expertise of industry sought. In this regard, of particular concern is the extremely long time period between data input and meaningful actions taken and/or needed analyses completed. In the rapidly changing shipping and shipbuilding industries that exist worldwide, conclusions based on "old data" even if it is "correct data" when coupled with the extremely long time required for either political or budgeting actions is a cause for concern. When basic data is incorrect, incorrectly interpreted, or future projections are based on unsound or overly optimistic assumptions, the cause for concern is greatly heightened. Indeed, the national security can be placed in jeopardy. At a minimum, it would seem that "good planning" would seek as a minimum requirement the views of industry experts in the development of plans and analyses relating to the maritime policy. This is particularly important because the industry is subject to extremely rapid change and high volatility.

We have pointed out on numerous occasions that the noncentralized development of maritime policy and lack of the requirement that policy be tested as to its effect on the national security *before implementation* is a serious flaw in management. The military is required to rely on others beyond their control to provide assets vital to the performance of their responsibilities but lack the ability to cause meaningful review and testing of policy changes that may cause their missions to be impossible to accomplish.

The record speaks with clarity in evaluating the advancement promised for the maritime industry in 1980. Rather than building a growing and viable merchant marine and shipbuilding industry, contraction and continuing loss of capability and assets in these industries has been the chosen course.

That this course is correct, that the national risks it entails are acceptable, or that the original plan set out as the guideline in 1980 was an incorrect perception of national requirements has never been articulated to the American people. On the basis of the record, the program espoused in 1980 for the achievement of maritime sufficiency has not been put in place.

What of the future? **S.G. Gorshkov,** Admiral of the Fleet of the Soviet Union, was quoted: "The flag of the Soviet Navy flies over the oceans of the world. Sooner or later the United States will have to understand it no longer has mastery of the seas."

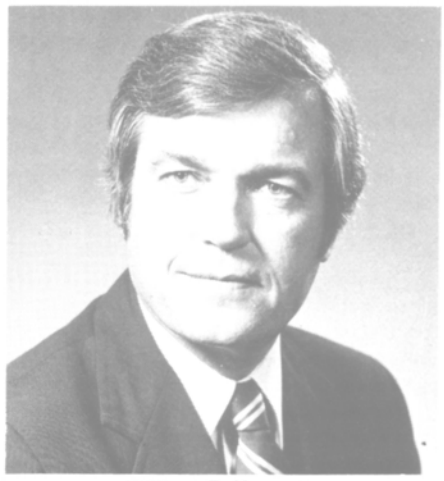
In 1980 candidate **Reagan** said: "This seven-point program will be carefully developed and it will be carried out. We cannot expect others—either allies or adversaries—to respect our interests if we show no respect or concern for them ourselves. The failure to develop and carry out an effective naval and maritime program will deny the use of the seas to the United States and, eventually, to the Free World."

Argumentum terminare. ■

U.S. SHIPBUILDING INDUSTRY HAS MADE GREAT STRIDES IN IMPROVING EFFICIENCY AND REDUCING COSTS

A MESSAGE FROM THE CHAIRMAN OF THE SHIPBUILDERS COUNCIL OF AMERICA

William E. Haggett, President
Bath Iron Works Corporation



William E. Haggett

The year 1985 witnessed the continued resurgence of the United States as the world's foremost naval power. Measured by any yardstick, the Navy should meet its 600-ship goal by the end of this decade. President **Reagan,** Secretary of Defense **Caspar W. Weinberger,** and Secretary of the Navy **John F. Lehman Jr.** are to be commended for their steadfastness in sticking to this objective.

The advent of Gramm/Rudman/Hollings, with its laudable end of reducing and ultimately eliminating the huge federal budget deficit, means that reductions in defense spending likely will be necessary. The Navy will be asked to bear an equitable share of the burden. However, these cuts must be judiciously made so as to not jeopardize the hard-earned improvements made in the size, structure, and capability of the fleet. Indeed, the task of sustaining the Navy at adequate levels is as important as building the 600-ship Navy in the first place.

We as shipbuilders recognize that we must increase productivity and minimize waste to offset the budget reductions in the next few years. Measurable progress has been achieved. The initial congressional focus of fraud, waste, and abuse in the defense industry caused contractors to reexamine internal management procedures and controls and our business relationships and responsibilities, and implement changes where appropriate. It is important to understand, however, that excessive imposition of rules, audits, and law upon the defense industry can complicate the procurement process, increase costs, delay schedules, and impair the quality of the end product.

In March (1985), I wrote to various senior members of the Reagan Administration to express our concern that unless more positive and supportive actions were taken, the decline of the capability and capacity of the shipbuilding and ship repair industry would continue beyond the dangerously low levels then existing. Most notable among the replies received was that from Defense Secretary **Weinberger.** His reply contained the following:

"We in Defense agree that the Nation must take steps to revitalize our maritime industry if we are to have sufficient capacity and capability to meet our mobilization requirements. The Navy's current and planned shipbuilding and repair programs are, by themselves, insufficient to support the Nation's present shipyards at an efficient level of production. Moreover, a further decline in the number of shipyards would reduce the competitive base for these essential Navy programs. Clearly what is needed is a revitalization of the commercial segment of the maritime industry."

Also in March, I met with Senator **Ted Stevens,** chairman of the Senate Merchant Marine Subcommittee, to urge that he undertake a leadership role in the development of some form of maritime legislation to fill the void that exists in maritime policy as related to shipbuilding and ship repair, and pledged that the shipbuilding industry would actively support and participate in such efforts. His response was that he, together with his colleague Senator **Daniel K. Inouye,** believed that their active involvement in working directly with the senior leaders of the industry could produce positive initiatives, and that he and Senator **Inouye** were prepared to undertake the difficult work required.

As the year progressed, it became very clear that there would be almost no commercial shipbuilding opportunities, and that the Navy shipbuilding and ship repair programs would not provide replacement business as the backlog of T-ship programs approached completion. Indeed, at year-end the Navy programs on the basis of funds authorized and appropriated by the Congress, exhibited negative growth. Thus, the decline in the national level of ship construction and repair was destined to continue.

In August the Bennett-Warner Commission, created but unfunded by the prior Congress and charged with studying and recommending solutions to the national security aspect of the problems confronting the maritime industry, was funded by the Congress. It is clear that the Commission was created by the Congress as a result of its frustration caused by inaction in developing a sound and balanced maritime program. Yet, as this message is written, the five public sector members of the Commission have not been formally nominated. Although staff has been assigned and is at work, the Commission still lacks leadership and direction. We in the shipbuilding industry hope that the actions necessary to implement the Commission are taken promptly, because we are well aware of the immensity of the tasks that lie before it and the limited time provided to carry out the mandate of the Congress.

As I have previously stated, the shipbuilding industry has made great strides in improving its efficiency and in reducing costs related to shipbuilding and ship repair. Not only have shipyards performed well, but suppliers have also worked hard to achieve these goals. We were pleased when Secretary of the Navy **Lehman** stated that the shipbuilding industry had become the most reliable and cost-effective of the Navy's contractors—and we pledged to him that the industry will continue this performance.

It is obvious that the shipbuilding industry working alone cannot succeed. Continuation of the past few years' performance requires understanding, support, and equally effective management by the Navy and the other government representatives with whom we must interface in carrying out shipbulding and ship repair contracts. Despite this need, it is apparent that more adversary relationships are developing between some contractors and the government. As a consequence, both time and cost are frequently sacrificed in an effort to satisfy Congressional critics of the defense industry.

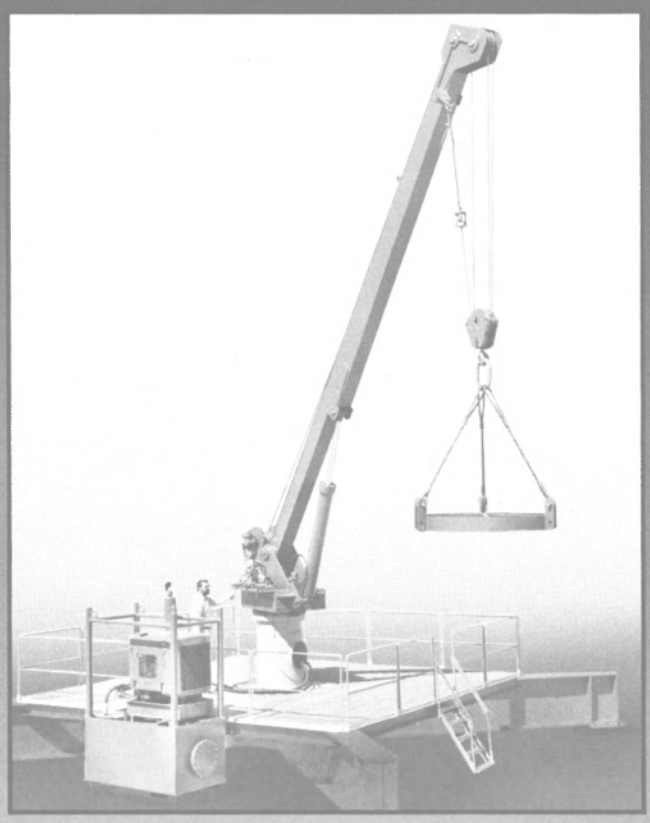
On a positive note, a vital and important first step to build more ships has been taken. Under the able leadership of Senator **Stevens** and with the support of many others in both Houses of the Congress, funding for a new shipbuilding program, "Build and Charter," was provided in the Continuing Resolution passed in December. That program is subject to development and enactment of authorizing legislation—hopefully in 1986.

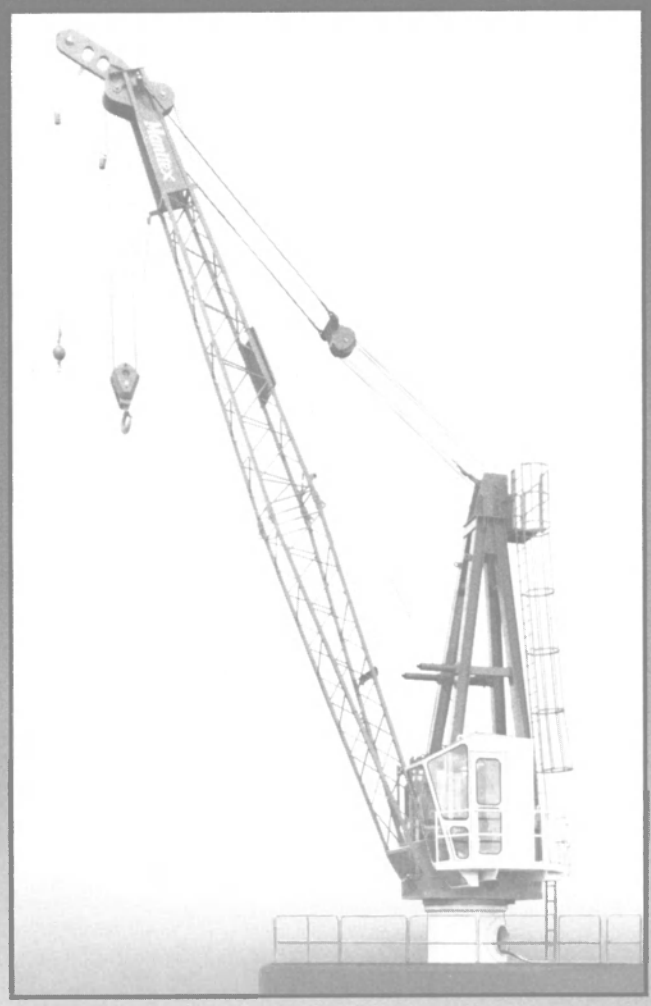
The program is only possible because of funds saved by the shipbuilding industry's performance under past Navy contracts. We understand that the concept does not constitute a fully developed maritime plan, and that much remains to be done even after implementation. It is equally clear that the development of authorizing legislation will be no easy task. It is apparent, however, that "Build and Charter" enjoys broader industry support than many other commercial shipbuilding programs suggested in the past, and it is not a subsidy despite what critics may allege.

We are determined to carry on our efforts to develop this meaningful "Build and Charter" program that will provide vitally needed national security assets and enhance this country's commercial viability at the same time.

MANITEX SEACRANES

...the new standard of offshore and pedestal-mounted lifting performance!





- **COMPLETE "FAMILY" OF CRANES...** Select from 4 box boom models ranging in capacity from 5 to 70 tons... or 5 lattice boom models with 5 to 150-ton ratings.
- **MARINE-ENVIRONMENT QUALITY...** Every Manitex SeaCrane is constructed of marine-quality components, with complete material traceability available upon customer request.
- **VERSATILE COMPONENT DESIGNS...** permit fast servicing and easy interchangeability of components from model to model.
- **INTERNATIONAL CERTIFICATIONS...** Manitex SeaCranes are the only pedestal-mounted cranes that exceed stringent operating codes established by API, Lloyds, DNV, NMD, and ABS.
- **WORLDWIDE DISTRIBUTOR NETWORK...** provides complete parts and service availability 24 hours a day, 7 days a week.

- **OTHER MANITEX SEACRANE FEATURES...**
  All modular design.
  360° swing capability.
  Optional onboard and remote controls.
  Optional onboard and remote power units.
- **MARKET DEDICATION...** Manitex is committed to the pedestal crane market as exemplified by its investment in two modern manufacturing facilities located in McAllen, Texas, and Reynosa, Mexico. In addition, the parent corporation of Manitex, The Manitowoc Company, Inc., offers a strong financial base and has more than 60 years crane manufacturing experience.

Manitex

For further specifications and information:

MANITEX INC.
A Subsidiary of The Manitowoc Company, Inc.
2203 Timberloch Place • Drawer 14, Suite 130
The Woodlands, Texas 77380 • Phone: 713-367-7372
Telex: 201121-MANTX-UR

Manitowoc

Circle 13 on Reader Service Card

U.S. BARGE AND TOWING OPERATIONS

Joseph A. Farrell

Our Transportation Policy Is No Transporation Policy

by
Joseph Farrell, President
The American Waterways Operators, Inc.

It is said of the mythical figure Damocles that he was forced to take his meals, his head bent precariously over his plate, with a sharp sword suspended above his head—that cruel instrument held aloft by a thread the width of a single hair.

Sad to say, America's inland and coastal water carriers, now mired in the fourth year of a deep and widening depression cast off, when they are fortunate enough to get their hands on enough freight to justify the excursion, under a latter-day sword of Damocles. This weapon is wielded by the very government which should, but does not, have a coherent transporation policy to promote competition through equitable, consistent and non-discriminatory treatment toward all the transporation modes. In theory, special preference is to be given to none; likewise, no special handicaps are to be imposed. But, it is not so. Government policy toward America's transporation system is fickle, lacking in cohesion or direction and manifestly inconsistent in the manner in which it dispenses and withholds its largesse.

The National Transporation Policy, codified at 49 USC 10101, states in part that ". . . it is the policy of the United States government to provide for the impartial regulation of the modes of transporation."

Unfortunately, this simple policy has been supplanted by an incoherent and disjointed system. By extension, this muddled policy disrupts the essential. . . to the American consumer . . . competition between the various modes. Competition is the moral shield of the free enterprise system: It produces lower prices, better service and ongoing innovation which in turn generates higher productivity. In the end, lack of a singular vision regarding transporation policy is a thief with his hands in the pocketbook of the American consumer.

Let's examine the various modes.

Consider the case of the airline industry. In that industry there is a user tax. But airline user taxes take the form of a direct tax on the real user of airline services—the customer. The airline user tax manifests itself as a tax on individual tickets. It is a tax which is inescapable—all direct, or real, users of the service provided must pay this tax. In the barge industry, it is the carrier who pays the tax. And, in the devastated barge industry, that tax cannot be shared with the shipper. There is no way to pass on the tax.

Consider also the case of the trucking industry. A few years ago, members of the Administration took a look around for some revenue enhancements—called "taxes" by most folks—and hit upon the idea of levying a huge user tax on the trucking industry. The tax took the form of the Surface Transporation Assistant Act which was passed by the Congress and was signed into law in 1982.

After all the applause had died down, somewhat more sober elements in the Administration and in the Congress began to look at the real condition of the trucking industry as opposed to its outdated reputation as a bloated, protected special interest, and a fair amount of the tax enacted a few years ago was rescinded. Why? Because responsible people in government looked at their handiwork and realized that they had made a grievous error. In this case, government acted responsibly, recognized its error and took laudable steps to correct it. The point of course, is that the government dispenses its largesse selectively. Sometimes properly, sometimes not.

It is worthwhile also to consider the case of the railroad industry. Consider specifically, CONRAIL—which has emerged from the protective warmth of mother government's apron and—with a little push from mom—has decided to go out into the world and seek his fortune on his own.

The next time someone tells you how much it will cost to send Johnny to college, remember and be thankful that you were not called upon to raise baby CONRAIL to his maturity. Or perhaps more accurately, try to forget that you actually help raise the little railroad to manhood—despite the fact that mother government—ever protective of her brood—claims full credit for baby CONRAIL's remarkable performance—so remarkable is baby CONRAIL that he is up for sale—at the firesale price of 1.2 billion dollars.

Mother government originally considered only selected bids for baby. The winner (so far), the Norfolk and Southern Railroad, I should just mention as an aside, is considered by the same mother goverment . . . different branch . . . as a "revenue" inadequate" railroad. Transporation Secretary **Elizabeth Dole** chose Norfolk Southern in the baby CONRAIL sweepstakes and recommended to Congress that the railroad be awarded custody of the perky lad.

Mother government is really pulling a fast one on the American public in the whole baby CONRAIL episode. The total federal bailout of the previously strapped railroad cost 7.2 billion dollars—you paid. What's more, in 1984 and last year, baby CONRAIL showed a profit of about one-half billion dollars each year, which was not returned to you.

The Staggers Rail Act of 1980 deregulated the nation's railroads on the correct premise that the railroads needed help. The Congress determined that the railroads were an indispensible adjunct of the national carrier network and needed temporary protection. Why? For the public good. Such determinations are the proper role of government as a caretaker of the national interest.

But one goal of the Act—the concept of revenue adequancy for the freight rail industry—needs to be briefly considered here because it has ramifications which impact the waterways industry and other modes of transporation as well.

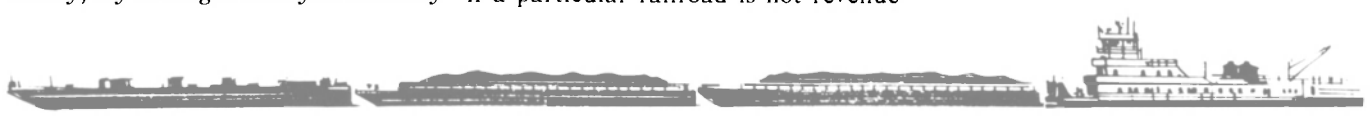
Put succinctly, revenue adequacy means making your basic costs as well as a reasonable profit margin on employed capital. In deregulating the railroads, the Congress recognized that the precipitous decline in rail profitability justified the concept of revenue adequency. Put another way, if a particular railroad is not revenue adequate, it can increase prices to shippers beyond the threshold which would otherwise be permissible until, under the complex formulas employed in the Staggers Act, the carrier has achieved an acceptable level of profitability.

The Staggers Rail Act has been abused by the Interstate Commerce Commission (ICC). According to the ICC, which has administrative oversight in the area, there are *no* revenue adequate railroads after nearly six years of degregulation. This is indeed curious because Wall Street touts railroad issues as exceptionally good investments. Though receiving the great benefits of "revenue inadequacy," various railroads buy other railroads and barge lines for well in excess of a billion dollars a pop.

By any objective, unbiased criteria, the water carrier industry is not now revenue adequate. We ask that the government, when it embarks upon policies such as grain embargoes and payment-in-kind programs, which drastically reduce the movement of grain and agrichemicals, recognize the severe financial impact of these programs on our industry. Revenue adequacy is a philosophical concept. and a good one in the abstract. But in practice for this concept to be a benefit and not a hinderance to the nation's transportation system it must be equitably and universally applied. It must not be a special prequisite for a single carrier mode.

Look at CSX and Norfolk Southern railroads. They are the bidders on a big barge line and baby CONRAIL, respectively. Both are deemed by the federal government as revenue inadequate. Financial data on these companies is readily available—they are publicly held. What that data reveals makes for a hard case for those who suggest that these railroads are not revenue adequate. The data reveal them to be highly profitable enterprises by any conventional business yardstick.

In taxable years 1981 to 1983, CSX Corporation not only paid no federal tax whatsoever, on profits of 1.75 billion dollars, but received re-



bates of taxes paid in earlier years or sold "excess" tax benefits to the extent that the Corporation actually got money back from the federal government. Even more difficult to substantiate in light of the government's position on the revenue inadequacy of CSX Corporation, is that supposedly strapped Corporation's near magical ability to come up with 1.06 billion dollars to purchase Texas Gas Resources, parent company of one of the nation's largest independent barge companies with which CSX Corporation directly competes.

The Norfolk Southern Corporation, which is blessed by mother government as the purchaser of CONRAIL, is, of course, revenue inadequate. This despite profits in taxable years 1981 to 1983 of a respectable 574 million dollars.

The question one unfamiliar with the rarified practices of government might ask is: If I correctly understand the determination of revenue inadequacy to mean an inability to make basic costs, how come these supposedly revenue inadequate companies are at the same time so profitable and flush with cash that they are buying barge lines, bidding on CONRAIL and generally behaving like robust, healthy businesses?

A more pertinent question might be: If I correctly understand the ruinous financial condition of the inland barge industry, how come these companines are not, at least for a time, put behind the benevolent apron of mother government rather than made subject to still higher user taxes in their time of need?

Above all, where is the fairness in all this?

We in the waterways business insist these inbalances be brought to light and be righted. What we do *not* advocate is the establishment of another "Super Commission" to oversee and treat fairly all of the various transportation sectors. The institutions already exist to do that. They just aren't doing their job.

The primary institution charged with the administrative implementation of Congressional mandates regarding transportation issues is the Department of Transportation (DOT). As an institution, the DOT has failings but the most glaring from our standpoint is its exaggerted tilt toward the rail industry—to the detriment of the other modes, in particular the barge mode which constitutes the primary competition to the railroads for hauling bulk commodities.

Ostensibly, the DOT is impartial. Some might argue that the Department is impartial by calling attention to the Maritime Administration (MarAd) now under the DOT roof—as the institutional advocate for maritime interests. You see my point about imbalance.

Leaving the administrators of the law aside, what of the lawmakers themselves? On Capitol Hill, confusion reigns regarding maritime matters as it does in virtually all other aspects of the legislative process. In both Houses of Congress, committees and subcommittees are split along the different carrier fault lines and they act in virtual isolation from one another—rather than in concert as they should if we are to have a coherent national transportation policy.

In the Senate for example, there is the Committee on Commerce, Science and Transporation. There is also an Aviation Subcommittee, a Merchant Marine Subcommitte, and a Surface Transportation Subcommittee, In the House, there is an Energy and Commerce Committee, a Merchant Marine and Fisheries Committee, a Public Works and Transportation Committee—under the auspices of which fall subcommittees on Aviation, Water Resources and Surface Transportation. Small wonder that laws are passed which result in such incoherency.

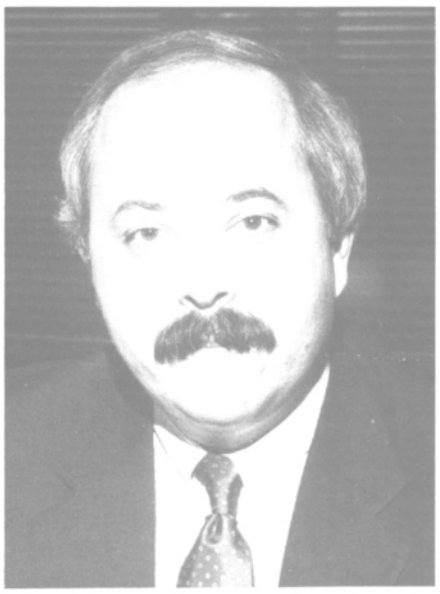
In the end, it is the American consumer who loses due to lessened competition.

One of the frustrations one encounters in reading the myth of Damocles is that there is no final, fundamental resolution to the tale. The sword is left hanging—so is the reader.

Please make no mistake—all Americans, not merely those whose livings depend on the transportation network, sit under the capricious sword of the latter-day Damocles, whose name is the United States government.

Our condition, too, remains unresolved. But there is no question that we—like Damocles—live in a perpetual state of dread. This is not a pleasant condition. Much more to the point; it is wrong in its disservice to the American people. ■

U.S. BARGE AND TOWING OPERATIONS



Thomas A. Allegretti

REGULATORY OVERKILL PERSERVERES

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

Thomas Jefferson's familiar axiom that "Eternal vigilance is the price of liberty" has an analogous meaning beyond its historical and national value to American industrial sectors exposed to the often severe impact of federal government regulations. With apologies to our third President, the marine industry's variation on Mr. Jefferson's theme has long been that "Eternal vigilance in the regulatroy process is the price of protecting our future." It was then that the marine industry joined American industry as a whole in breathing a collective sigh of relief with the advent of the Reagan Administration philosophy that less governmental regulation would be the standard of the 1980s. Coming as it did on the heels of what seemed to be a sustained federal effort to solve all of society's perceived ills through additional regulation, the Reagan Administration commitment to less government intervention was greeted warmly by most sectors of the American economy. Indeed, there was considerable hope that this new policy would lead not only to a lessened volume of regulation, but also to more rational regulation in those areas where government oversight genuinely would serve the public interest.

Five years after the institution of this policy, at least two questions appear to be salient regarding federal regulations affecting the maritime industry. First, how well has the Administration's commitment to less government been tangibly translated into a lesser volume and more reasoned set of regulatory proposals? Second, has the Administration's laissez faire policy made obsolete the marine industry's watchstanding requirement of "eternal vigilance?"

For the marine industry at least, the torrential downpour of federal regulatory proposals has indeed lessened somewhat in the past five years. That probably is true for most other industrial sectors as well. The most tactile manifestation comes in the form of a physically leaner *Federal Register* than that which industry had become accustomed to in the 1970's. The Administration policy of less government intervention has also trickled down into the agencies, dampening what had been an ardent zeal to regulate. Furthermore, there are encouraging signs that some federal regulators have come to understand that government regulation is not always the only, or even the most appropriate means to address the particular concern at hand. It is also fair to say that there is an increased awareness within the federal agencies that government regulations do have serious bottom-line impacts on those regulated, and that regulations should seek to achieve the objective of serving the public interest without creating economic havoc in the process.

Notwithstanding a *Federal Register* of somewhat diminshed girth, the impertive of "eternal vigilance" is as critical today as at any time in the past. For even in an Administration committed to less government intervention and the ascendancy of free market forces, the danger of regulatory overkill continues to be ominously real.

The most recent example of the federal regulatory excess that many had hoped to be a thing of the past emerged from the U.S. Environmental Protection Agency (EPA) late in 1985. On November 29, the EPA proposed to amend the hazardous waste management regulations under the Resource Conservation and Recovery Act (RCRA) by listing all used oil as a hazardous waste. The basis for this far-reaching proposal is an EPA determination that used oil "typically and frequently" contains significant quantities of contaminants "which would pose a substantial hazard to human health and the environment, if improperly managed." On its face, the proposal and its rationale appear to constitute a reasonable governmental response designed to protect the American populous from a prevailing danger. However, closer examination reveals a proposal which contains all of the classic characteristics of regulatory overkill.

First, consider that in response to the instruction of Congress that EPA evaluate those types of used oil which should be identified and listed as hazardous wastes, EPA fired a blunderbuss, declaring *all* used oil, irrespective of its source, to be hazardous. This approach is particularly egregious to marine interests, who found in examining EPA's analysis of used oil samples that, although the marine industry was indentified as one of twelve major industrial sectors generating used oil, the study failed to examine any meaningful quantities of used oil generated by marine sources. Indeed, the EPA study on which the used oil proposal is based could only identify 40 percent of the samples analyzed as to their general source, i.e., automotive or industrial. The sources of the remaining 60 percent of the samples analyzed are completely unidentified, and unknown to EPA. The industry's concern with the inadequacy of the analysis on which the proposal is based has been further heightened by recent reports in the trade press which indicate that EPA chose the carte blanche listing option, without ever considering alternatives, after an internal determination that the analyses needed to identify hazardous used oil by category were "too time-consuming."

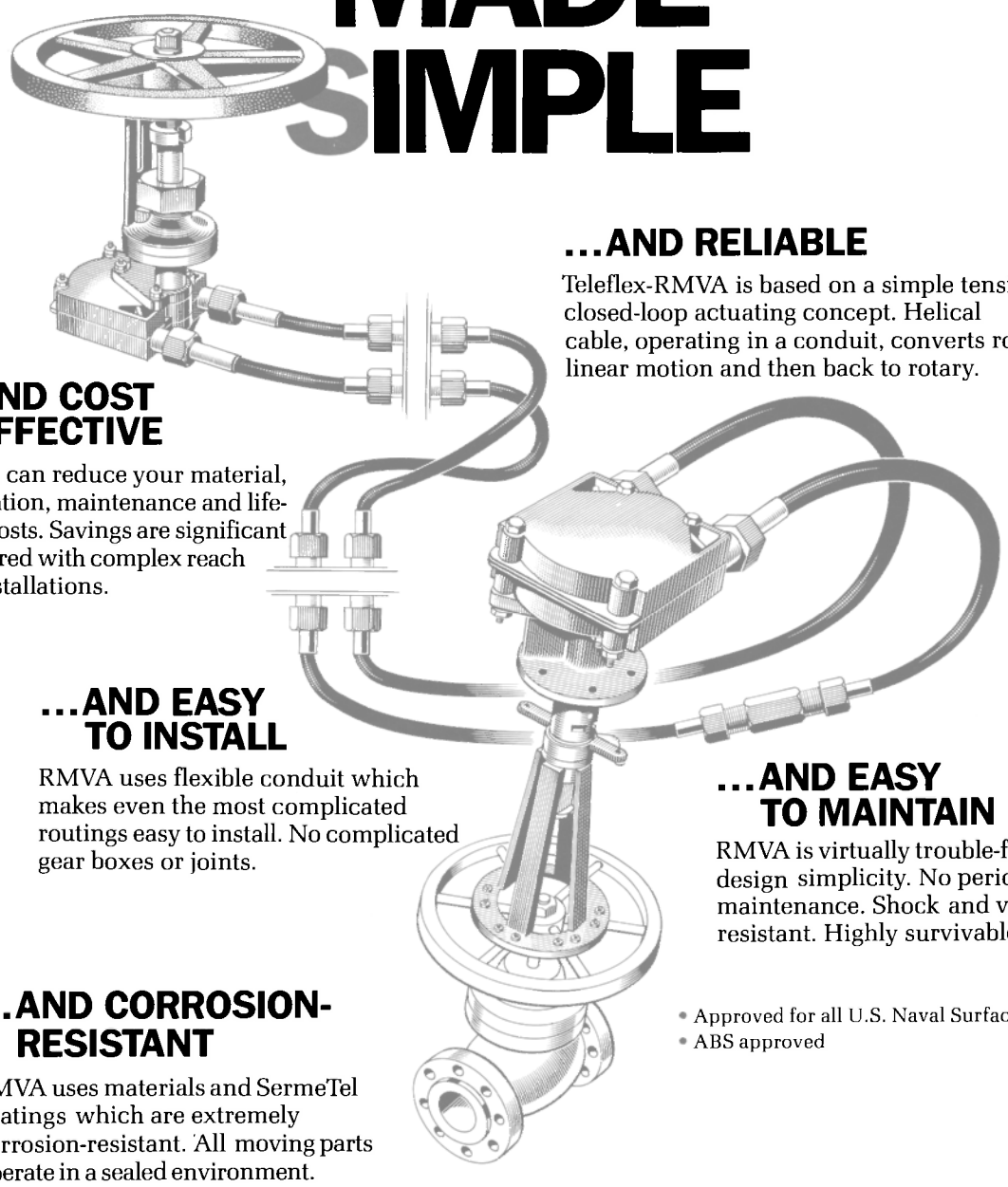
Building on the foundation of this flaccid sampling base, the Agency proposal includes a second characteristic common to examples of regulatory excess: making a blanket presumption of guilt, and then shifting the burden of proof to those who have been presumed guilty and are therefore made subject to the regulation. Vessel operators who have used oil that is not hazardous, and who seek to avoid being mired in this regulatory swamp, would be required to engage in a lengthy "delisting" procedure, while, ironically, the criteria for achieving delisting have not yet been specified by EPA.

As is usually the case with proposals of this type, the industry concerns expressed extend not only to the analysis on which the proposal is based or the approach which the Agency elects to pursue, but also address the potential for profound impacts. The EPA used oil proposal would establish broad areas of wrongful regulatory trespassing on international maritime conventions and U.S. Coast Guard regulations which already govern used oil generated by vessels. The proposal also dismisses as a "perception problem" the intensely negative commercial and environmental impacts of subjecting vessel operators to the draconian joint and several liability provisions of the Comprehensive Environmental Response, Compensation and Liability Act (Superfund), and fails to consider, the attendant effect on the operator's ability to secure insurance coverage. Such insensitivity to the impact of its provisions on those regulated is unfortunately also often characteristic of proposals which overstep the bounds of regulatory reason and common sense.

A final characteristic common to proposals which lean toward regulatory excess is their frequent failure to genuinely serve the public interest. The EPA used oil proposal also fits the mold in this regard by establishing a regulatory regime which will have the clear effect of discouraging the optimal management of used oil through recycling. The simple maxim of recycling economics is that the recycled product is only viable if it is a less expensive substitute than the virgin product. EPA proposes to establish a regulatory system which is sure to deal a rabbit punch to the used oil recycling market.

Needless to say, the EPA proposal has been the cause for well founded concern among all segments of the U.S. maritime industry, and for that matter, within most U.S. industrial sectors as well. A broad-based effort is underway to amend it before its promulgation as a permanent and final regulation. However, in the broader context the EPA proposal serves as a vivid reminder that even in a more reasoned regulatory environment, the threat of regulatory excess is always clear and present. For that reason, the maritime industry's variation on President Jefferson's "eternal vigilance" theme continues to be timely and sage advice. Keep watch. ■

REMOTE VALVE ACTUATION MADE SIMPLE



...AND RELIABLE

Teleflex-RMVA is based on a simple tension-tension, closed-loop actuating concept. Helical cable, operating in a conduit, converts rotary to linear motion and then back to rotary.

...AND COST EFFECTIVE

RMVA can reduce your material, installation, maintenance and life-cycle costs. Savings are significant compared with complex reach rod installations.

...AND EASY TO INSTALL

RMVA uses flexible conduit which makes even the most complicated routings easy to install. No complicated gear boxes or joints.

...AND EASY TO MAINTAIN

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

...AND CORROSION-RESISTANT

RMVA uses materials and SermeTel coatings which are extremely corrosion-resistant. All moving parts operate in a sealed environment.

- Approved for all U.S. Naval Surface Ships
- ABS approved

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

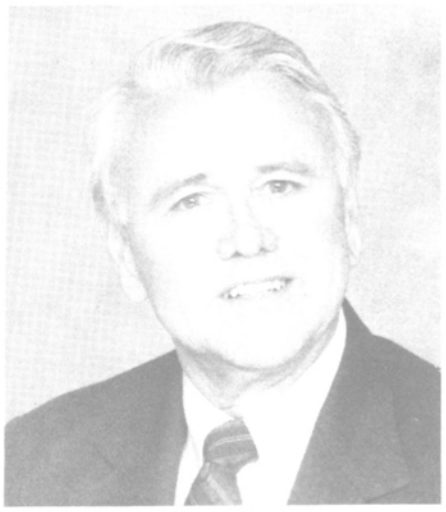
Specify RMVA by Teleflex. It's simple. It works. It's proven. Call or write for your complete RMVA Design Manual.

I.M.
Teleflex INCORPORATED
remote actuation systems

771 First Avenue • King of Prussia, PA 19406–1401
(215) 265-0556 • Telex 90-2528 • TWX: 710-670-1122

Circle 131 on Reader Service Card

INLAND/COASTAL-
SMALLER/MEDIUM YARDS



Walter W. Rody

AWSC And The Industry:

Working For The Future

Walter W. Rody, Chairman
American Waterways Shipyard Conference
And President,
Port Allen Marine Service, Inc.

It is an unmistakable fact—the second tier shipyards of the nation are still experiencing a severe economic depression. New construction starts on inland and coastal equipment are virtually non-existent. Overall employment levels continue to decline, and repair work remains the mainstay of the industry. However, despite these extremely difficult times, there are a handful of shipyards which continue to believe in the future of a second tier shipyard industry, and continue to work to preserve and improve the climate in which it operates. These yards are known collectively as the American Waterways Shipyard Conference (AWSC).

AWSC, as many are aware, is the national trade association for the second tier shipyards, and is a conference of the American Waterways Operators, Inc. Through AWSC, we have an opportunity to influence regulations and legislation in order to ensure the continued viability of the industry. By joining together and presenting a unified front, we can effectively fight the industry's battles. One shipyard working alone cannot hope nor expect to have the same impact.

Undoubtedly, many problems confront our industry, but there are two issues which, if left untouched, have the potential to cause great harm to the second tier shipyards. First on the list is the Occupational Safety and Health Administration's (OSHA) current proposal on occupational exposure to benzene which will have a tremendous impact on all barge cleaning operations. Second is the continued effort by certain legislators to allow foreign-built passenger vessels to enter the Jones Act trades. (Only the cabotage provisions of the Jones Act will be considered in this article.)

Barge cleaning operations constitute a small part of our industry. However, they perform a necessary and vital function for the tank barge operators who transport liquid cargoes along our waterway system. It is necessary to clean a tank barge whenever repair work, a change of cargo, or an inspection is necessary. In OSHA's proposal, the agency would reduce the current permissible exposure limit from ten parts per million (ppm), to one ppm. If a cleaning plant exceeds the proposed one ppm exposure level, then it must comply with a myriad of requirements such as extensive medical examinations for all exposed employees—at no cost to the employee, extensive recordkeeping requirements, and engineering controls to reduce the exposure level to one ppm. It is AWSC's contention that it is virtually impossible for any cleaning plant to clean and maintain a tank barge that has carried a benzene-contaminated cargo to or below one ppm. Consequently, all of the other requirements contained in the proposal would have to be met, putting a further economic burden on the facility. This proposal has the capacity to eliminate this sector of the industry.

In their rulemaking process, OSHA identified seven primary industry sectors which they felt to be directly impacted; the barge cleaning industry was not one of them. OSHA did not review the impacts their rule would have on us, and in fact, we were not even considered. AWSC took vigorous exception to this. We felt that since we were directly impacted by any benzene proposal, OSHA had the obligation to conduct a study examining the impacts and alternatives of their rulemaking on the cleaning industry, similar to the studies conducted for the other seven industry sectors. Because of AWSC's persuasive arguments, OSHA plans to conduct such a study. It took AWSC, through collective action, to push OSHA into recognizing the existence of this industry sector and to realize the harm the new proposal could cause. By working with OSHA, AWSC will help to develop a realistic proposal which will adequately protect the worker.

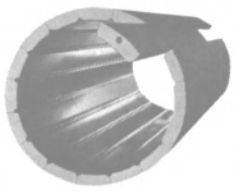
Continued protection of the Jones Act remains the primary mission of AWSC. The Jones Act is the very cornerstone of the United States' current maritime policy. However, efforts are constantly mounted which would weaken this important maritime legislation. Movement to allow foreign-built passenger vessels into our domestic trades remains strong. Last December, Senator **Ted Stevens** (R-AK) introduced S. 1935, which would allow up to five foreign-built vessels into the domestic trades providing they meet certain requirements. These vessels must have cabin space for 400 passengers, be built no more than twelve years prior to enactment of this legislation, and must have all repair work necessary for U.S. Coast Guard compliance completed in U.S. shipyards. AWSC sees this as another attempt to undermine the integrity of the Jones Act. In past years, AWSC has opposed and helped to defeat similar legislative attempts. We continue to vigorously oppose this legislation which has the potential to cause serious harm to the domestic shipbuilding industry.

The construction of passenger vessels in the second tier shipyards is the one bright spot in today's economic climate. According to a recent news report, twenty-six passenger and large recreational vessels were built by twenty-four different shipyards, and it is a growing market. Just three years ago, only nine vessels were built by four shipyards. Although the vessels considered in S. 1935 are larger than those built by our industry, these larger vessels can still be considered competition for the smaller vessels.

AWSC is not opposed to the development of a U.S. cruise industry. Critics have stated and continue to state, that a viable domestic cruise ship industry does not exist in the United States. We disagree. The vessels we build operate in the domestic trades and provide U.S. citizens the opportunity to enjoy scenic tours around the country. These vessels are crewed, operated and built by U.S. citizens, and provide jobs in the shipyards where they are built. Allowing these foreign-built vessels into the domestic trades would disrupt this developing market and further increase the unemployment level in our industry. AWSC is the only shipbuilding trade association vigorously opposing this legislation.

These are only two of the many challenges facing our industry today. No one shipyard can hope to have the collective impact of AWSC. Only by taking a combined, proactive stance can we hope to confront these problems and preserve our industry's future. As AWSC chairman, I look forward to meeting these and all other challenges head on. The members of the American Waterways Shipyard Conference believe strongly in the future of the second tier shipbuilding industry, and it is only by working together that we can be assured that a future exists. ■

DEMOUNTABLE RUBBER STAVE BEARINGS

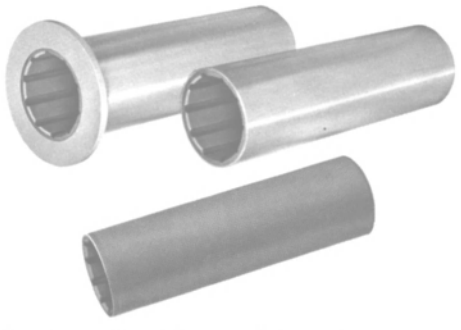


Individual water lubricated bearing staves install around shaft in stern tube or strut. Assembly can be made with shaft in place. Simplifies inspection or bearing replacement. Water grooves provide flushing out of harmful particles—non-pollutant. A very popular bearing available in a full range of shaft sizes up to 36".

SPIRAL TUBE DEMOUNTABLE KEEL COOLERS

Spiral design of 90-10 Cupro nickel tubes maximize heat transfer. Less corrosion problems. Through-the-hull fittings not needed. Tubes easily replaced if ever damaged. System design permits cooling of gear boxes, hydraulics. Available in units of 4 to 24 tubes in single or double bank.

SLEEVE and FLANGED BEARINGS

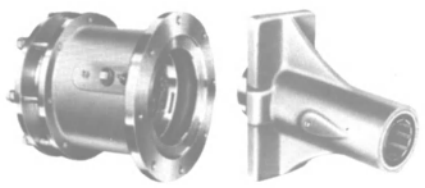


Naval brass shelled Sleeve and Flanged Bearings meet military specification MIL-B-17901A (Ships) Class II Full Molded Type. Non-Metallic Sleeve Bearings have tough thermoset plastic shell making them ideally suited where corrosion or electrolysis is a problem.

Johnson®
DURAMAX® MARINE PRODUCTS

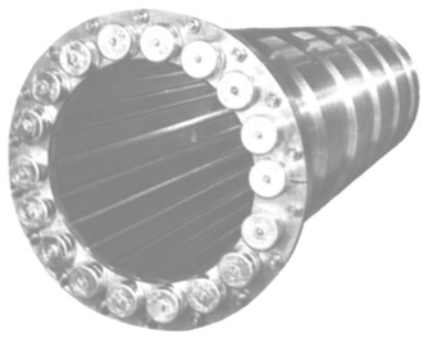
Quality Engineered For Better Performance

HEAVY DUTY STUFFING BOXES and STERN CASTINGS



Styles available for shaft, bulkhead and rudder applications. Select from bronze, steel or aluminum. "Air-Seal" types feature inflatable rubber ring which seals around shaft, to allow packing change without dry docking. Models with water inlet for bearing lubrication, grease only, or combination water-grease service. A full range of types and sizes including split types are available.

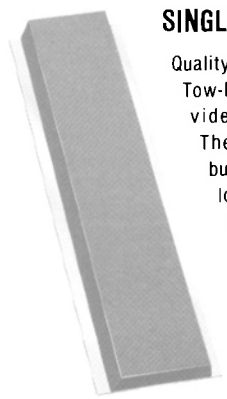
METAL BACKED STAVE BEARINGS



For extreme shaft loads; demountable staves of nitrile rubber bonded to naval brass bar for dove-tail fit into keyway bronze housing. Housings completely machined to specifications and ready for installation in stern tube. Staves are individually replaceable without removing shaft.

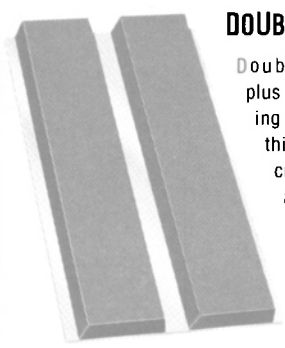
RUBBER FENDERING SYSTEMS

SINGLE TOW-KNEES



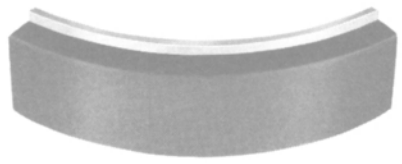
Quality engineered Duramax Tow-Knee Pusher Plates provide superior protection. These impact absorbing bumpers help give vessels longer and better service life. Choice of steel or aluminum plate.

DOUBLE TOW-KNEES



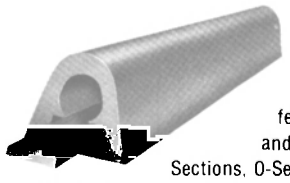
Double your protection plus mounting and welding ease with twin 2 inch thick rubber pads securely vulcanized to a single steel or aluminum plate. Count on tough Duramax Tow-Knees to stand up under rugged operating conditions.

PRECURVED TOW-KNEES



These curved tow-knees designed for maximum corner protection are engineered to absorb and cushion impact over long periods and varied operating conditions. Their 2-inch quality rubber pad is securely bonded to the plate, assuring long-lasting trouble-free service.

DOCK and BOAT BUMPERS



Duramax offers a wide variety of durable rubber fendering for vessels and docks including D-Sections, O-Sections, Rectangular and Wing Types—all featuring built-in absorbing qualities.

MADE IN U.S.A.

Write or Call for Specific Data for Any or All Products

DURAMAX® MARINE
division of ***The Johnson Rubber Company***
A Subsidiary of Duramax Inc.

®T.M. Reg.
PRINTED IN U.S.A. 6-2004-1085

Middlefield, Ohio 44062 U.S.A. Area Code: 216/632-1611
Telex: 21-2564 JRCM UR / Cable: "DURAMAX"
Dependable Products For Ships Throughout The World

Circle 207 on Reader Service Card

Offshore Service Vessels, Tugboat And Inland Towboat Fleets

It is estimated there are approximately 10,000 self propelled tugs, towboats and offshore service vessels in the U.S. fleet.

Add to the above 10,000 tugs, towboats, and offshore support vessels, the balance of the United States shallow draft self propelled fleet consisting of 11,000 ferries, patrol boats, dredges, pilot boats, fire boats, small harbor tankers, etc. and the number of documented small vessels in the U.S. self-propelled fleet (5-1000 gross tons) totals approximately 21,000 shallow-draft vessels.

NOTE: These tables do not include all shallow-draft vessels, i.e. ferries, patrol boats, fire boats, dredges, commercial fishing boats, etc. are not included.

The figures in these shallow draft tables are conservative as it is not possible to obtain data on every tug, towboat and offshore support vessel in the United States fleet (a limited number of smaller and/or individually owned boats may not be included).

Source: Statistics courtesy of Fleet Data Service, P. O. Box 2576, Nacogdoches, TX 75963. Telephone (409) 569-0375.

Similar tables can be generated on specific segments of the fleet on a custom basis. Contact **James O. Covington,** Fleet Data Service, P. O. Box 2576, Nacogdoches TX 75963. Telephone (409) 569-0375 for further details of information available.

Statistical Summary

The following statistical tables summarize the 1310 tugs in the active American fleet at the end of 1984.

Three specific vessel types have been identified and tabulated separately. These are anchor-handling tugs (AT), tugs used with dedicated tug/barge units (IT), and tugs in ship-handling or harbor service (HBR). The remaining 776 tugs are not equipped with deck gear for anchor-handling service, fendering for ship-handling service, or special barge connectors for ITB service. These 776 tugs are in general towing service.

The inventory has been tabulated by year built and horsepower ranges. It should be noted that these HP ranges are based upon manufacturer's ratings for continuous duty.

[Tables continue on page 54]

Statistical Summary

The following tables summarize the American-owned offshore service vessel fleet as it existed at the end of calendar year 1985. Tables have been provided showing the breakdown of the fleet by LOA by year built and by horsepower by year built for each of the major vessel types. The final table shows the breakdown of the entire fleet by vessel type and year built. Each of these tables represents the available fleet at year end. Each includes the known operational fleet plus vessels temporarily laid up, vessels in unknown fleets, and completed by unsold shipyard stock. Vessels removed from the fleet during 1985 are not included.

AMERICAN OFFSHORE SERVICE VESSEL INVENTORY
Year-end 1985

	VESSEL TYPES											
	150-ft LOA and Larger						60- to 149-ft LOA					
YEAR BUILT	SU	AS	TS	GE	MISC	Total	CREW	UTIL	LB	MISC	Total	GRAND TOTAL
Unknown	0	0	0	4	1	5	1	6	12	5	24	29
Pre-60	0	0	0	0	0	0	5	31	0	12	48	48
1960	0	0	0	0	0	0	1	0	0	0	1	1
1961	0	0	0	0	1	1	2	0	0	1	3	4
1962	0	0	0	0	1	1	4	3	0	1	8	9
1963	0	0	0	0	0	0	4	12	0	1	17	17
1964	1	0	0	2	0	3	3	15	0	4	22	25
1965	8	0	0	2	1	11	12	24	0	8	44	55
1966	15	2	0	5	4	26	11	25	0	8	44	70
1967	11	1	0	2	3	17	8	9	0	0	17	34
1968	13	3	0	2	2	20	13	5	0	3	21	41
1969	19	4	0	2	0	25	20	3	1	2	26	51
1970	7	10	2	3	5	27	26	9	1	0	36	63
1971	11	9	4	0	3	27	14	7	0	0	21	48
1972	20	3	7	2	0	32	16	18	0	1	35	67
1973	22	3	17	3	4	49	22	16	1	0	39	88
1974	19	2	40	4	1	66	21	18	2	2	43	109
1975	15	3	35	1	2	56	16	14	0	1	31	87
1976	15	1	28	4	5	53	27	24	5	2	58	111
1977	31	5	16	2	4	58	29	29	4	1	63	121
1978	40	2	23	4	5	74	49	58	13	3	123	197
1979	49	8	18	3	4	82	47	76	13	3	139	221
1980	45	5	10	7	6	73	82	75	13	5	175	248
1981	56	12	9	11	5	93	79	110	16	3	208	301
1982	72	18	42	12	1	145	35	42	12	3	92	237
1983	20	12	32	3	7	74	8	8	3	2	21	95
1984	10	0	7	3	2	22	6	9	4	0	19	41
1985	3	1	5	3	1	13	17	8	4	0	29	42
1986	0	0	4	2	2	8	1	0	0	0	1	9
TOTAL	502	104	299	86	70	1061	579	654	104	71	1408	2469

AMERICAN-OWNED OFFSHORE, COASTAL & HARBOR TUGS
Year-end 1984

	Vessel Types				
YEAR BUILT	MISC TUGS	AH TUGS	HBR TUGS	ITB TUGS	TOTAL
UNK	6	8	3	0	17
Pre-60	262	1	130	2	395
1960	4	0	8	0	12
1961	9	0	6	0	15
1962	7	1	3	0	11
1963	8	1	4	0	13
1964	17	1	2	0	20
1965	27	2	8	0	37
1966	29	13	6	0	48
1967	39	8	4	2	53
1968	28	5	5	0	38
1969	16	11	7	1	35
1970	30	11	6	1	48
1971	11	7	3	1	22
1972	13	7	1	1	22
1973	16	5	3	2	26
1974	16	17	2	1	36
1975	35	30	7	5	77
1976	40	22	5	4	71
1977	39	9	2	4	54
1978	24	10	3	2	39
1979	19	6	3	4	32
1980	15	3	16	2	36
1981	27	19	12	6	64
1982	30	12	9	12	63
1983	8	7	6	0	21
1984	1	0	3	1	5
Totals	776	216	267	51	1310

HARBOR TUGS
Year-end 1984

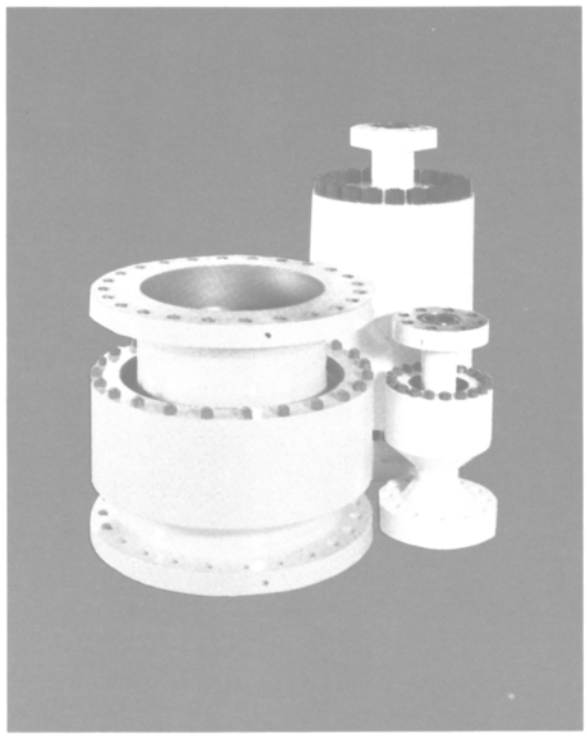
	Total Continuous Horsepower															
YEAR BUILT	UNK	Under 500	500 999	1000 1499	1500 1999	2000 2499	2500 2999	3000 3499	3500 3999	4000 4499	4500 4999	5000 5499	5500 5999	6000 6499	6500 6999	TOTAL
UNK	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	3
Pre-60	1	9	9	50	34	20	3	2	1	0	0	0	0	0	1	130
1960	0	0	0	0	7	1	0	0	0	0	0	0	0	0	0	8
1961	0	0	0	1	1	4	0	0	0	0	0	0	0	0	0	6
1962	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	3
1963	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	4
1964	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
1965	0	2	1	1	3	0	0	1	0	0	0	0	0	0	0	8
1966	0	0	2	2	2	0	0	0	0	0	0	0	0	0	0	6
1967	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	4
1968	0	0	0	2	1	0	0	1	0	1	0	0	0	0	0	5
1969	0	0	0	1	2	2	2	0	0	0	0	0	0	0	0	7
1970	0	0	1	1	0	1	0	2	0	1	0	0	0	0	0	6
1971	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	3
1972	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
1973	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	3
1974	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2
1975	0	0	0	1	0	1	0	2	2	1	0	0	0	0	0	7
1976	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	5
1977	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
1978	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	3
1979	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	3
1980	0	0	1	0	8	1	2	3	0	1	0	0	0	0	0	16
1981	0	0	0	0	1	0	1	5	3	1	1	0	0	0	0	12
1982	0	1	0	0	0	0	0	4	4	0	0	0	0	0	0	9
1983	0	0	0	0	1	0	0	1	4	0	0	0	0	0	0	6
1984	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
Totals	1	13	16	65	71	35	12	27	19	6	1	0	0	0	1	267

LOCKSEAL FLEXIBLE COUPLINGS ARE JUST ONE WAY YOU CAN USE MURDOCK TECHNOLOGY.

You probably know Murdock for its Lockseal flexjoints — flexible couplings used in the offshore market's drilling risers, production risers, bearings in tension leg platforms, flexible joints in subsea pipelines, tensioners, and in a variety of other critical applications.

So it may surprise you to learn that Murdock can bring a multitude of design, engineering, manufacturing, and testing capabilities to virtually any high technology project.

The capabilities Murdock can bring to bear on your project include:



Design and engineering — the staff includes specialists in mechanical design, metallurgy, elastomers, structural analysis, fatigue and fracture mechanics, corrosion protection, and non-destructive testing.

Computer design and analysis — in addition to CAD/CAM the library includes programs for fracture mechanics, structural analysis, and elastomer characterization.

Manufacturing — with CAD/CAM technology and highly accurate machine tools, Murdock can produce components and assemblies using standard and exotic materials. And heat treating facilities can handle parts to 5 ft. by 6 ft. by 16 ft.

Corrosion protection — experience includes fusion-set epoxy coatings, two-coat epoxy paints, and aluminum flame spray coatings. Also, cathodic protection systems can be designed and installed.

Demanding quality control — Murdock's role as a major contractor in a high technology field is supported by the latest computer-controlled measuring devices, specially designed test facilities and non-destructive test equipment.

Complete program management — Murdock serves as a single-source contact for engineering, scheduling, fabrication, expediting, and coordination with subcontractors and certifying agencies.

For information on how you can put Murdock's extensive array of capabilities to work, write or call:

MURDOCK ENGINEERING COMPANY

P.O. Box 2278, Irving, TX 75061
Phone: 214/790-1122 TWX 910/860-5901 Telex 792996

Circle 190 on Reader Service Card

Offshore Service Vessels, Tugboat And Inland Towboat Fleets

INTEGRATED TUG/BARGE TUGS
Year-end 1984

Total Continuous Horsepower

YEAR BUILT	2000 2499	2500 2999	3000 3499	3500 3999	4000 4499	4500 4999	5000 5499	5500 5999	6000 6499	6500 6999	7000 7499	7500 7999	— 11000 — 11499	— 14000 — 14499	14500 14999	15000 15499	— 18000 — 18499	TOTAL
Pre-60	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
1970	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
1971	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
1972	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
1973	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
1974	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1975	0	0	1	1	0	0	0	2	0	0	0	0	0	1	0	0	0	5
1976	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
1977	0	0	1	0	0	0	0	1	0	0	1	0	0	1	0	0	0	4
1978	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
1979	0	0	0	0	0	0	0	3	0	0	1	0	0	0	0	0	0	4
1980	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
1981	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	1	2	6
1982	0	0	0	1	0	3	0	0	1	0	1	0	0	1	0	0	5	12
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Totals	0	1	2	4	1	4	1	12	1	0	8	2	2	3	1	1	8	51

ANCHOR-HANDLING TUGS
Year-end 1984

Total Continuous Horsepower

YEAR BUILT	500 999	1000 1499	1500 1999	2000 2499	2500 2999	3000 3499	3500 3999	4000 4499	4500 4999	5000 5499	5500 5999	6000 6499	6500 6999	7000 7499	7500 7999	8000 8499	TOTAL
UNK	0	2	5	1	0	0	0	0	0	0	0	0	0	0	0	0	8
Pre-60	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
1963	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
1964	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1965	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
1966	0	3	1	1	2	5	0	1	0	0	0	0	0	0	0	0	13
1967	0	1	3	0	1	0	1	1	0	0	1	0	0	0	0	0	8
1968	0	0	1	3	0	1	0	0	0	0	0	0	0	0	0	0	5
1969	0	0	0	4	5	1	0	1	0	0	0	0	0	0	0	0	11
1970	0	0	5	2	0	1	0	0	1	0	2	0	0	0	0	0	11
1971	0	0	1	0	0	2	2	0	2	0	0	0	0	0	0	0	7
1972	0	0	0	1	0	2	2	2	0	0	0	0	0	0	0	0	7
1973	0	0	2	0	0	1	0	1	0	0	1	0	0	0	0	0	5
1974	0	0	2	2	0	0	0	3	2	0	7	0	0	1	0	0	17
1975	0	0	2	3	2	3	1	3	1	0	9	0	0	6	0	0	30
1976	0	0	0	1	0	1	5	0	6	0	3	2	0	3	0	1	22
1977	0	0	0	4	0	2	0	0	0	0	2	0	0	1	0	0	9
1978	0	3	1	4	0	2	0	0	0	0	0	0	0	0	0	0	10
1979	0	0	1	0	0	1	2	2	0	0	0	0	0	0	0	0	6
1980	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
1981	0	5	3	1	0	8	1	0	0	0	1	0	0	0	0	0	19
1982	0	3	2	5	0	1	1	0	0	0	0	0	0	0	0	0	12
1983	0	0	0	0	0	2	2	0	0	0	1	2	0	0	0	0	7
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	18	32	32	10	37	17	15	12	0	27	4	0	11	0	1	216

CONVENTIONAL TUGS IN MISCELLANEOUS TOWING SERVICE
Year-end 1984

Total Continuous Horsepower

YEAR BUILT	UNK	Under 500	500 999	1000 1499	1500 1999	2000 2499	2500 2999	3000 3499	3500 3999	4000 4499	4500 4999	5000 5499	5500 5999	6000 6499	6500 6999	7000 7499	Unk	TOTAL
UNK	4	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Pre-60	0	19	56	66	82	22	4	1	9	1	1	0	0	0	1	0	0	262
1960	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	4
1961	0	0	2	2	3	1	0	0	0	0	0	0	1	0	0	0	0	9
1962	0	1	1	1	1	2	0	1	0	0	0	0	0	0	0	0	0	7
1963	0	1	0	1	1	2	0	1	0	1	0	0	1	0	0	0	0	8
1964	0	5	2	3	2	2	1	1	1	0	0	0	0	0	0	0	0	17
1965	0	2	1	4	7	5	1	2	4	0	1	0	0	0	0	0	0	27
1966	0	2	2	0	10	4	5	1	2	2	0	0	1	0	0	0	0	29
1967	0	1	2	3	15	3	4	4	5	1	1	0	0	0	0	0	0	39
1968	0	1	1	1	7	4	4	4	1	1	0	0	4	0	0	0	0	28
1969	0	3	3	0	3	3	0	1	3	0	0	0	0	0	0	0	0	16
1970	0	1	4	4	5	2	3	3	3	2	0	0	3	0	0	0	0	30
1971	0	2	0	2	1	0	2	1	0	1	0	0	1	0	0	1	0	11
1972	0	0	1	4	1	1	0	5	0	0	0	0	1	0	0	0	0	13
1973	0	0	0	0	0	0	0	7	1	6	0	0	0	0	0	2	0	16
1974	1	0	2	5	1	3	0	1	1	0	0	0	0	0	0	2	0	16
1975	0	0	2	1	0	10	2	4	4	4	0	0	2	0	0	6	0	35
1976	0	0	3	1	1	4	0	5	8	4	1	0	1	0	0	12	0	40
1977	0	0	3	5	1	10	1	8	6	0	0	0	0	0	0	5	0	39
1978	0	4	1	4	4	4	0	3	2	1	0	0	1	0	0	0	0	24
1979	0	0	1	2	5	0	2	4	2	1	0	0	1	0	0	1	0	19
1980	0	1	5	2	3	2	0	0	0	0	0	0	1	0	0	1	0	15
1981	2	0	3	6	11	2	0	0	1	1	0	0	0	1	0	0	0	27
1982	1	0	3	0	7	6	2	1	4	1	2	0	1	2	0	0	0	30
1983	1	0	0	1	2	2	1	1	0	0	0	0	0	0	0	0	0	8
1984	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Totals	9	44	97	119	173	96	33	59	57	27	6	0	19	3	1	30	0	776

Offshore Service Vessels, Tugboat And Inland Towboat Fleets

AMERICAN INLAND TOWBOATS
31 December 1983

	Horsepower Range																								
YEAR BUILT	1 499	500 999	1000 1499	1500 1999	2000 2499	2500 2999	3000 3499	3500 3999	4000 4499	4500 4999	5000 5499	5500 5999	6000 6499	6500 6999	7000 7499	7500 7999	8000 8499	8500 8999	9000 9499	9500 9999	10000 10499	10500 10999	11000 11499	Unk	TOTALS
Unknown	18	15	12	4	2	2	1	1	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	41	100
1870–1879	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
1880–1889	2	3	2	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
1890–1899	1	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
1900–1909	6	5	7	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
1910–1919	7	3	0	9	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
1920–1929	19	19	8	5	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	57
1930–1939	104	25	4	14	5	3	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	161
1940–1949	254	115	60	51	14	8	23	12	1	2	0	1	1	0	0	0	0	0	0	0	0	0	0	1	543
1950–1959	449	214	95	59	36	24	37	21	7	5	0	3	3	0	2	0	0	0	0	1	0	0	0	1	957
1960	43	19	5	8	1	0	6	3	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	88
1961	31	18	9	6	0	1	1	1	2	2	0	3	1	0	1	0	0	0	0	0	0	0	0	0	76
1962	35	28	8	6	3	0	1	2	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	88
1963	39	34	3	7	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	88
1964	42	30	7	5	3	0	2	4	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	96
1965	38	45	11	4	3	1	0	1	1	1	2	6	0	0	0	0	0	2	0	0	0	0	0	0	115
1966	70	51	18	6	5	7	4	3	1	1	4	3	0	0	2	0	0	2	0	0	0	0	0	0	177
1967	51	41	20	11	2	1	2	2	0	1	2	7	1	0	0	0	0	0	0	0	0	0	0	0	141
1968	40	41	20	8	5	1	3	1	2	2	2	6	0	0	0	0	0	0	0	0	0	0	0	0	131
1969	49	41	13	13	3	0	3	1	2	2	2	5	0	0	1	0	0	1	0	0	0	0	0	0	136
1970	48	39	19	6	1	6	1	1	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	127
1971	37	34	9	17	3	3	4	3	3	1	0	2	0	0	2	0	1	1	0	0	0	0	0	0	120
1972	29	42	14	13	3	3	1	3	2	0	0	3	0	0	4	0	2	1	0	0	0	0	0	0	120
1973	32	43	15	8	2	1	5	4	5	0	0	11	1	0	1	0	2	1	0	0	0	0	0	0	131
1974	22	71	21	10	4	1	6	5	10	0	0	12	1	0	0	0	0	3	0	0	1	2	0	0	169
1975	38	78	53	23	3	5	6	6	12	1	0	13	0	1	4	0	1	2	0	0	1	2	0	0	249
1976	30	58	17	13	3	3	4	0	9	2	0	12	0	0	0	0	0	0	0	0	0	3	0	0	154
1977	24	49	12	10	2	0	4	2	1	2	0	12	2	0	0	0	1	0	0	0	0	1	0	0	122
1978	30	67	7	8	1	1	1	0	4	1	0	2	2	0	0	0	0	0	0	0	0	1	1	0	126
1979	50	78	30	11	0	0	0	6	1	0	0	7	3	0	0	0	0	0	0	0	0	0	0	1	187
1980	58	159	57	12	2	2	1	4	0	3	0	6	7	0	0	0	0	0	1	0	0	0	0	1	313
1981	23	135	61	13	11	1	4	1	1	1	1	3	14	0	0	0	0	0	1	0	0	0	0	2	272
1982	17	35	29	9	10	0	7	6	4	0	1	8	10	0	1	0	1	0	1	0	0	0	0	5	144
1983	8	7	12	3	4	0	1	1	0	0	0	0	1	2	2	0	1	0	0	0	0	0	0	7	49
Totals	1744	1646	660	378	138	80	134	97	75	28	15	131	50	4	22	0	9	13	3	2	2	9	1	60	5301

INLAND TOWBOATS—This fleet consists of all towboats and tugs operated exclusively on the inland waterways and intracoastal canal system. The fleet includes vessels operated on the inland waters of the Pacific Northwest and the Atlantic Coast as well as those operated on the Mississippi River System and her tributaries.

OFFSHORE DRILLING RIGS

OFFSHORE MOBILE DRILLING UNITS UNDER CONSTRUCTION, ON ORDER, OR WITH LETTERS OF INTENT TO SHIPYARDS—MAY 1986

RIG OWNER	RIG NAME	DESIGN	WATER DEPTH	SHIPYARD	ESTIMATED COST ($MM)	DELIVERY DATE	CONTRACT
			JACKUPS — 12				
Foramer/FELS	Columbus	Friede & Goldman L-780 Mod. V. 3 triangular legs, cantiliever.	350′	Far East Livingston - Singapore	$ 40.0	06/86	Available.
IFESM Petromar	IFESM Petromar Jackup 01	Unknown.		Galatz - Galatz, Romania		Undet.	IFESM Petromar - owner operated.
IFESM Petromar	IFESM Petromar Jackup 02	Unknown.		Galatz - Galatz, Romania		Undet.	IFESM Petromar - owner operated.
Larson & Toubros	L & T Unnamed Jackup 01	Hitachi, 3 legs, cantilever.	350′	Hitachi Zosen - Japan	$ 55.0e	06/86	ONGC - India.
Maersk	Maersk Giant	Hitachi Drill Hope, 3 legs, cantilever.	350′	Hitachi Zosen - Japan	$ 50.0	05/86	Available.
Maersk	Maersk Unnamed Jackup 02	Hitachi Drill Hope, 3 legs, cantilever.	350′	Hitachi Zosen - Japan	$ 50.0	06/86	Available.
ONGC	Sagar Kiran	Baker Marine BMC 300 IC, independent leg, Class M, cantilever.	300′	Mazagon Dock - Bombay, India	$ 45.0	11/86e	ONGC - owner operated - India.
Odebrecht Perfuracoes	Norbe 05	Verolme 40/78 TC, 3 legs, cantilever.	300′	Verolme - Rio de Janeiro, Brazil	$ 35.0e	12/86	Available.
Rowan	Rowan Gorilla 04	LeTourneau, 150 88 C enhanced Gorilla, 3 square legs, propulsion assist, cantilever.	450′	Marathon LeTourneau - Vicksburg, Ms. USA	$ 85.0	10/86	Available.
Transworld	Mr Mac	LeTourneau 150 88 C Gorilla, 3 square legs, propulsion assisted, cantilever.	328′	UIE - Clydebank, Scotland	$ 80.0	08/86	Available.
USSR	USSR Unnamed Jackup 01	Arctic Class.	300′	Vyborg Shipyard - USSR	$ 67.0	06/86	USSR - owner operated - Arctic.
USSR	USSR Unnamed Jackup 02	Arctic Class.	300′	Vyborg Shipyard - USSR	$ 67.0	06/87	USSR - owner operated - Arctic.
			SEMI-SUBMERSIBLES — 25				
Amethyst BV (Workships BV Mgr)	Amethyst	4 columns, dynamic positioning, DSV capability.	665′	Sheepswerf De Hoop - Netherlands	$ 65.0e	07/86	Available.
Ben Odeco Britoil	Ocean Alliance	Odeco Ocean Ranger modified, 8 columns, self propelled, conventional mooring or dynamic positioning.	4,500′	Scott Lithgow - Greenock, Scot., UK	$180.0	01/87	Britoil - owner operated - UK.
Drillmar	Drillmar Unnamed Semi 01	Friede & Goldman, L-1033, Enhanced Pacesetter, thruster assist.	1,500′	Astano - El Ferrol, Spain	$ 96.0	06/87	Drillmar - owner operated.
Dyvl	Dyvl Alpha	Dyvl Ultra Yatzy, self propelled, dynamic positioning capability.	2,300′	Nippon Kokan - Japan	$ 75.0	06/86	Available.

RIG OWNER	RIG NAME	DESIGN	WATER DEPTH	SHIPYARD	ESTIMATED COST ($MM)	DELIVERY DATE	CONTRACT
Dyvl	Dyvl Unnamed Semi 01	Dyvl Super Yatzy, self propelled, dynamic positioning capability.	2,500′	Boelwerf - Temse, Belgium	$ 65.0	07/87	Available.
Laly/Mohn	Laly/Mohn Unnamed Semi 01	Trosvik SS Bingo II 4500, self propelled.	2,500′	Trosvik - Brevik, Norway	$ 80.0	06/87	Conoco - 18 mos. - Gulf of Mexico.
Mosvold Rederi (Dyvl Mgr)	Mosvold Unnamed Semi 01	Super Yatzy, self propelled.	1,500′	Nakskov Skibsverft - Denmark	$ 90.0	03/87	Available.
Mosvold Rederi (Dyvl Mgr)	Mosvold Unnamed Semi 02	Super Yatzy, self propelled.	1,500′	Nakskov Skibsverft - Denmark	$ 90.0	09/87	Available.
Norcem	Norjarl	Aker H 4.2, 8 columns, self propelled, conv. mooring or DP.	2,000′	Hyundai - South Korea	$ 80.0	06/86	Available.
Odeco	Ocean America	Odeco Ocean Odyssey, 8 columns, self propelled.	3,000′	Hyundai - South Korea	$ 65.0	04/87	Available.
Odeco	Ocean Valiant	Odeco Ocean Odyssey, 8 columns, self propelled.	3,000′	Hyundali - South Korea	$ 65.0	12/86	Available.
Reading & Bates	Zane Barnes	Friede & Goldman L-1020 Trendsetter, self propelled, mooring assist.	5,000′	Ishikawajima Harima - Japan	$ 76.0	11/86	Shell - 5 yr contract - US Gulf of Mexico.
Ross Drig	Ross Rig	Marotec/Ross, self-propelled, mooring assist, harsh environment.	1,640′	Mitsubishi - Japan	$ 75.0	05/86	Available.
Salpem	Scarabeo 05	Maritime Engineering, ME-4500, dynamic positioning capability.	3,000′	Fincantieri - Genoa, Italy	$110.0	12/87	Available.
Smedvig	West Vision	Marine Engineering, self propelled, dynamic positioning capability.	2,000′	Daewoo - South Korea	$ 87.0	06/86e	Statoll - to 1994.
Sonat	Sonat Pratt Rather	Gotaverken GVA 4500, 4 columns, self propelled.	3,000′	Daewoo - South Korea	$ 70.0	1Q/87	Available.
Sonat	Sonat George Richardson	Gotaverken GVA 4500, 4 columns, self propelled.	3,000′	Daewoo - South Korea	$ 70.0	2Q/87	Available.
Sonat	Sonat Unnamed Semi 03	Gotaverken GVA 4500, 4 columns, self propelled.	3,000′	Daewoo - South Korea	$ 70.0	06/87e	Available.
Sonat	Sonat Unnamed Semi 04	Gotaverken GVA 4500, 4 columns, self propelled.	3,000′	Daewoo - South Korea	$ 70.0	05/88	Available.
Sonat	Sonat Unnamed Semi 05	Gotaverken GVA 4500, 4 columns, self propelled.	3,000′	Daewoo - South Korea	$ 70.00	10/88	Available.
Sonat	Sonat Unnamed Semi 06	Gotaverken GVA 4500, 4 columns, self propelled.	3,000′	Daewoo - South Korea	$ 70.0	12/89	Available.
Transocean	Transocean 08	Aker H 4.2, 8 columns, self propelled.	2,000′	Hyundai - South Korea	$ 75.0	07/86	Available.
USSR	Shelf 05	Friede & Goldman, Enhanced Pacesetter, 6 columns, self propelled.	650′	Vyborg Shipyard - Vyborg, USSR	$ 65.0e	06/86e	USSR - owner operated - Sea of Okhotsk.
USSR	Shelf 06	Friede & Goldman, Enhanced Pacesetter, 6 columns, self propelled.	650′	Vyborg Shipyard - Vyborg, USSR	$ 65.0e	11/86e	USSR - owner operated - Barents Sea.
USSR	Shelf 07	Friede & Goldman, Enhanced Pacesetter, 6 columns, self propelled.	650′	Vyborg Shipyard - Vyborg, USSR	$ 65.0e	Undet	USSR - owner operated.
			SHIPS — 2				
ONGC	Sagar Bhushan	Gusto Engineering, Pelican w/conventional mooring.	1,000′	Hindustan Shipyard - India	$ 55.0e	Undet	ONGC - owner operated - India.
USSR	USSR Unnamed Ship 01	Soviet design, dynamic positioning.	1,000′	Leningrad, USSR	$ 60.0e	06/88e	USSR - owner operated.

Source: Offshore Data Services, Inc., Houston, Texas: The Offshore Rig Locator—published the first week of each month. Subscriptions available from Offshore Rig Data Services P.O. Box 19909, Houston, TX 77024. For full details on this and other publications and services from Offshore Data Services contact **Loran R. Sheffer,** president 3346 Walnut Bend, Houston, Texas 77042. Telephone (713) 781-2713; Telex 794 573

U.S.-FLAG OCEANGOING FLEET

Owner or Operator Name of Ship	Type	GT	DWT	HP T=Turbine D=Diesel	Year Built/ Rebuilt
AMERICAN HAWAII CRUISES					
550 Kearny Street, San Francisco, CA 94108					
Constitution	Cruise	20,251	7,100	T-55,000	51/84
Independence	Cruise	20,251	7,100	T-55,000	50/86
AMERICAN OVERSEAS MARINE CORPORATION					
97 East Howard Street, Quincy, MA 02169					
2nd Lt. John B. Bobo	RO/RO	41,700	22,700	D-26,400	1985
Pfc. Dewayne T. Williams	RO/RO	41,700	22,700	D-26,400	1985
1st Lt. Baldomerl Lopez	RO/RO	41,700	22,700	D-26,400	1985
1st Lt. Jack Lummus	RO/RO	41,700	22,700	D-26,400	1986
Sgt. William R. Button	RO/RO	41,700	22,700	D-26,400	1986
AMERICAN PRESIDENT LINES, LTD.					
1800 Harrison Street, Oakland, CA 94612					
President Adams	Cargo	16,000	22,200	T-24,000	68
President Cleveland	Cargo	16,000	22,200	T-24,000	69
President Eisenhower	Container	36,900	45,900	D-43,200	80/84
President F.D. Roosevelt	Container	36,200	45,900	D-43,200	80/84
President Fillmore	Container	17,800	17,500	T-24,000	68/72
President Grant	Container	26,700	37,300	T-32,000	71/78/83
President Hoover	Container	26,700	37,300	T-32,000	71/78/83
President Jackson	Cargo	16,000	22,200	T-24,000	68
President Jefferson	Container	21,500	18,500	T-28,500	73
President Johnson	Container	21,500	18,500	T-28,500	74
President Kennedy	Container	16,500	19,300	T-22,000	64/72
President Lincoln	Container	40,600	29,800	D-43,200	82
President Madison	Container	21,500	18,500	T-28,500	73
President McKinley	Container	17,800	17,500	T-24,000	68/72
President Monroe	Container	40,600	29,800	D-43,200	83
President Pierce	Container	21,500	18,500	T-28,500	73
President Taft	Container	17,800	17,500	T-24,500	67/72
President Taylor	Cargo	16,000	22,200	T-24,000	69
President Truman	Container	16,500	19,000	T-22,000	62/71
President Tyler	Container	26,700	37,300	T-32,000	72/78/83
President Van Buren	Container	17,800	17,500	T-24,000	67/72
President Washington	Container	40,600	29,800	T-43,200	82
President Wilson	Cargo	16,000	22,200	T-24,000	69
AMERICAN TRADING TRANSPORTATION COMPANY, INC.					
555 Fifth Avenue, New York, NY 10017					
Baltimore Trader	Tanker	31,228	57,884	T-15,000	55/71
Chesapeake Trader	Tanker	24,669	50,116	D-11,400	82
Delaware Trader	Tanker	24,669	50,057	D-11,400	82
Pennsylvania Trader	Tanker	20,046	34,124	T-13,750	62
Potomac Trader	Tanker	24,669	50,057	D-11,400	83
AMOCO SHIPPING COMPANY, INC.					
P.O. Box 8368, Chicago, IL 60680					
Delaware Sea	Tanker	15,000	27,770	TE-7,240	44/71
APEX MARINE CORPORATION					
2001 Marcus Avenue, Lake Success, NY 11042					
Adonis	Tanker	38,297	80,422	D-20,700	56/82
Altair	Bulk/Container	33,337	64,152	D-15,800	86
American Heritage	Tanker	44,000	91,849	T-24,500	78
Apollo One	Incin.	2,073	7,317	D- 2,250	85
Archon	Bulk	33,784	63,463	D-12,300	84
Aurora	Bulk	33,784	63,739	D-12,300	84
Baltimore	ITB	23,913	47,247	D-18,200	83
Beaver State	Tanker	44,900	91,849	T-24,500	78
Charleston	Tanker	21,649	39,366	T-12,000	56/80
Golden Monarch	Tanker	44,900	91,388	T-24,500	75
Groton	ITB	23,913	47,247	D-18,200	82
Jacksonville	ITB	23,913	47,247	D-18,200	82
Mobile	ITB	23,913	47,247	D-18,200	84
New York	ITB	23,913	47,247	D-18,200	83
Philadelphia	ITB	23,913	47,247	D-18,200	84
Scorpio	Tanker	14,156	24,513	T- 7,000	44/80
ARCO MARINE, INC. (ATLANTIC RICHFIELD COMPANY)					
515 S. Flower Street, Los Angeles, CA 90071					
Arco Alaska	Tanker	83,675	188,436	T-28,000	79
Arco Anchorage	Tanker	57,691	120,319	T-26,000	73
Arco California	Tanker	83,675	188,436	T-28,000	80
Arco Endeavor	Tanker	18,347	31,816	T-14,850	58
Arco Fairbanks	Tanker	57,700	120,585	T-26,000	74
Arco Heritage	Tanker	28,381	53,288	T-20,680	63
Arco Independence	Tanker	117,515	262,376	T-32,000	77
Arco Juneau	Tanker	57,691	120,585	T-26,000	74
Arco Prudhoe Bay	Tanker	35,646	69,797	T-20,000	71
Arco Sag River	Tanker	35,646	69,747	T-20,000	72
Arco Spirit	Tanker	117,515	262,376	T-32,000	77
BAY TANKERS INCORPORATED					
1 Chase Manhattan Plaza, New York, NY 10005					
Bay Ridge	VLCC Tanker	103,812	224,428	T-50,000	79
Maryland	VLCC Tanker	117,285	264,073	T-35,000	76
Massachusetts	VLCC Tanker	117,285	264,073	T-35,000	75
New York	VLCC Tanker	117,285	264,073	T-35,000	76
Stuyvesant	VLCC Tanker	103,812	224,670	T-50,000	77
CENTRAL GULF LINES, INC.					
650 Poydras Street, New Orleans, LA 70130					
Dawn	Cargo	11,309	12,939	T-18,150	63
Green Harbour	LASH	28,487	46,152	T-32,000	74
Green Island	LASH	28,487	46,152	T-32,000	74
Green Valley	LASH	28,487	46,152	T-32,000	74
Green Wave	Cargo/Cont.	9,521	9,928	D-10,000	80
Rapid	RO/RO	11,757	15,694	T-30,000	69
Rover	RO/RO	11,757	15,694	T-30,000	69
CHEVRON SHIPPING COMPANY					
555 Market Street, San Francisco, CA 94105					
Alaska Standard	Tanker	1,947	2,698	D- 1,700	59
Chevron Arizona	Tanker	16,941	39,207	GT/E-12,500	77
Chevron California	Tanker	35,588	70,213	T-20,000	72
Chevron Colorado	Tanker	16,941	39,203	GT/E-12,500	76
Chevron Louisiana	Tanker	16,941	39,258	GT/E-12,500	77
Chevron Mississippi	Tanker	35,589	70,213	T-20,000	72
Chevron Oregon	Tanker	16,941	39,274	GT/E-12,500	75
Chevron Washington	Tanker	16,941	39,167	GT/E-12,500	76

Owner or Operator Name of Ship	Type	GT	DWT	HP T=Turbine D=Diesel	Year Built/ Rebuilt
COASTWISE TRADING COMPANY, INC.					
2501 Palmer Highway, Suite 110, Texas City, TX 77590					
Amoco Tallahassee	Tug	273	412	D- 5,800	81
Amoco Atlanta	Tug	273	412	D- 5,800	82
Amoco Richmond	Tug	273	412	D- 5,800	82
Amoco Columbia	Tug	273	412	D- 5,800	82
Amoco Florida	Tank Barge	11,296	27,747	—	81
Amoco Georgia	Tank Barge	9,759	21,366	—	82
Amoco Virginia	Tank Barge	11,296	24,630	—	82
Amoco South Carolina	Tank Barge	11,321	24,654	—	82
COSCOL MARINE CORPORATION					
9 Greenway Plaza, Houston, TX 77046					
Coastal Manatee	Tanker	19,030	30,806	T-13,600	61
COVE SHIPPING INC.					
Wall Street Plaza, Suite 1630, New York, NY 10005					
Cove Leader	Tanker	40,511	71,054	T-25,000	59
Cove Liberty	Tanker	33,596	69,306	T-22,000	54/74/81
Cove Trader	Tanker	28,310	49,339	T-15,000	59
ENERGY TRANSPORTATION CORPORATION					
540 Madison Avenue, New York, NY 10022					
Energy Altair	Tug	262.6	—	D- 4,800	82
Energy Ammonia	LPG Barge	11,438	12,110	—	82
LNG Aquarius	LNG	95,084	71,475	T-43,000	77
LNG Aries	LNG	95,084	71,466	T-43,000	77
LNG Capricorn	LNG	95,084	71,409	T-43,000	78
LNG Gemini	LNG	95,084	71,327	T-43,000	78
LNG Leo	LNG	95,084	71,409	T-43,000	78
LNG Libra	LNG	95,084	71,503	T-43,000	79
LNG Taurus	LNG	95,084	71,495	T-43,000	79
LNG Virgo	LNG	95,084	71,482	T-43,000	79
EXXON SHIPPING COMPANY					
P.O. Box 1512, Houston, TX 77001					
Exxon Baltimore	Tanker	26,198	51,015	T-19,000	60
Exxon Baton Rouge	Tanker	34,266	75,600	T-19,000	69
Exxon Baytown	Tanker	32,136	57,720	D-16,800	84
Exxon Benicia	Tanker	75,272	172,775	T-26,700	79
Exxon Boston	Tanker	23,299	51,314	T-19,000	60
Exxon Charleston	Products Tanker	27,798	48,075	D-16,800	83
Exxon Galveston	Tanker	12,769	26,923	D- 7,000	70/78
Exxon Gettysburg	Tanker	23,655	39,029	T-26,500	57
Exxon Houston	Tanker	31,697	72,056	T-19,000	64
Exxon Jamestown	Tanker	19,734	40,631	T-26,500	57
Exxon Lexington	Tanker	19,734	40,631	T-26,500	58
Exxon New Orleans	Tanker	32,035	72,056	T-19,000	65
Exxon North Slope	Tanker	75,272	172,775	T-26,700	79
Exxon Philadelphia	Tanker	38,144	76,160	T-19,000	70
Exxon Princeton*	Tanker	21,446	42,595	D-11,200	82
Exxon San Francisco	Tanker	34,266	75,600	T-19,000	69
Exxon Washington	Tanker	19,734	40,631	T-26,500	57
Exxon Wilmington	Products Tanker	27,508	48,011	D-16,800	84
Exxon Yorktown*	Tanker	21,446	42,954	D-11,200	83

*Bareboat chartered from Connecticut National Bank

Owner or Operator Name of Ship	Type	GT	DWT	HP T=Turbine D=Diesel	Year Built/ Rebuilt
FALCON SHIPPING GROUP					
1000 Louisiana Street, Suite 2900, Houston, TX 77002					
Falcon Champion	Tanker	17,735	33,542	D-14,500	84
Falcon Countess	Tanker	20,751	37,276	D-15,000	72
Falcon Duchess	Tanker	20,751	37,276	D-15,000	71
Falcon Lady	Tanker	20,751	37,276	D-15,000	71
Falcon Leader	Tanker	17,735	33,542	D-14,500	83
Falcon Princess	Tanker	20,751	37,276	D-15,000	72
Golden Phoenix	OBO	78,164	128,000	T-17,600	83
Jade Phoenix	OBO	78,164	128,000	T-17,600	83
Pride of Texas	Bulk	24,384	36,500	D-15,600	81
Spirit of Texas	Bulk	24,384	36,500	D-15,600	82
Star of Texas	Bulk	24,384	36,500	D-15,600	82
FARRELL LINES INCORPORATED					
One Whitewall Street, New York, NY 10004					
Argonaut	Container	17,904	16,205	T-17,500	79
Export Challenger	Cargo/Container	11,000	10,985	T-13,750	63
Export Champion	Cargo/Container	11,000	10,990	T-13,750	63
Export Freedom	Container	17,904	16,230	T-17,500	72
Export Patriot	Containership	17,904	16,345	T-17,500	73
Austral Rainbow	LASH	26,456	29,749	T-32,000	72
HESS SHIPPING CORPORATION					
1 Hess Plaza, Woodbridge, NJ 07095					
Chesapeake	Tanker	27,000	50,000	T-15,000	64
HUDSON WATERWAYS CORPORATION					
1 Chase Manhattan Plaza, New York, NY 10005					
Manhattan	Tanker	63,681	113,800	T-43,000	62
Transcolorado	Heavy Lift	10,014	11,475	T- 9,000	45/68
Transcolumbia	Heavy Lift	10,014	11,475	T- 9,000	45/68
HVIDE SHIPPING INCORPORATED					
1900 S.E. 17th Street Causeway, Fort Lauderdale, FL 33316					
Frances Hammer/Oxy 4103	ITB	17,126	45,313	D-18,200	81
Julius Hammer/Oxy 4101	ITB	17,126	45,313	D-18,200	81
Seabulk Challenger/STL 3901	ITB	20,982	39,345	D-14,000	75
Seabulk Magnachem/ SCC 3902	ITB	18,671	39,344	D-14,000	77
INTEROCEAN MANAGEMENT CORPORATION					
Three Parkway, Philadelphia, PA 19102					
Brooks Range	Tanker	74,250	165,037	T-26,700	78
Thompson Pass	Tanker	74,250	165,037	T-26,700	78
U.S.T. Atlantic	Tanker	189,416	398,143	T-45,000	79
U.S.T. Pacific	Tanker	189,416	398,143	T-45,000	79
KEYSTONE SHIPPING COMPANY					
313 Chestnut Street, Philadelphia, PA 19106					
Atigun Pass	Crude/Products	74,251	173,380	T-26,700	77
Bennington	Crude/Products	27,325	53,150	T-20,700	63
Chelsea	Crude/Products	22,358	39,235	T-15,000	75
Cherry Valley	Crude/Products	22,358	39,230	T-15,000	74
Chestnut Hill	Crude Tanker	44,875	91,295	T-24,500	76
Chilbar	Chemical Tanker	21,937	39,363	T-20,460	59/81
Coronado	Crude/Products	22,358	39,237	T-15,000	73
Edgar M. Queeny	Chemical Tanker	19,047	37,106	T-15,000	70
Energy Independence	Collier	24,901	38,234	T-12,000	83
Fredericksburg	Crude/Products	21,557	39,374	T-20,460	58/80
Golden Gate	Crude/Products	27,899	61,952	T-20,000	70
Kenai	Crude/Products	60,385	123,113	T-30,000	79
Keystone Canyon	Crude/Products	74,251	173,380	T-26,700	78
Keystoner	Chemical Tanker	11,369	18,384	T- 7,700	53
Kittanning	Crude Tanker	44,875	91,344	T-24,500	77
Meton	Chemical Tanker	18,273	33,881	T-20,460	59
Petersburg	Crude/Products	27,470	50,063	T-15,000	63
Spirit of Liberty	Products Tanker	20,948	38,238	T-15,000	68
Tonsina	Crude/Products	60,385	122,781	T-30,000	78
Valley Forge	Chemical Tanker	20,572	37,753	T-15,000	66
LACHMAR SHIPPING					
c/o Gastrans, Inc., P.O. Box 5759, Lake Charles, LA 70606					
Lake Charles	LNG	87,000	68,000	T-43,000	80
Louisiana	LNG	87,000	68,000	T-43,000	80

U.S.-FLAG OCEANGOING FLEET

Owner or Operator Name of Ship	Type	GT	DWT	HP T=Turbine D=Diesel	Year Built/ Rebuilt
LYKES BROS. STEAMSHIP COMPANY					
300 Poydras Street, New Orleans, LA 70130					
Adabelle Lykes	Container	16,800	15,200	D-15,750	68/73
Almeria Lykes	Seabee	21,700	38,400	T-36,000	72
Ashley Lykes	Cargo/Cont.	11,900	14,300	T-11,000	63/73
Brinton Lykes	Cargo/Cont.	11,900	14,300	T-11,000	62/72
Charlotte Lykes	Container	16,800	15,200	D-15,750	68/73
Cygnus	RO/RO	13,100	14,500	D-19,000	77
Doctor Lykes	Seabee	21,700	38,400	T-36,000	72
Elizabeth Lykes	Cargo	11,000	14,700	T-15,500	65
Genevieve Lykes	Cargo	10,700	14,700	T-15,500	68
James Lykes	Cargo/Cont.	11,900	14,300	T- 9,900	60/72
Jean Lykes	Cargo/Cont.	11,900	14,300	T- 9,900	61/72
John Lykes	Cargo/Cont.	11,900	14,300	T- 9,900	60/72
Joseph Lykes	Cargo/Cont.	11,900	14,300	T- 9,900	60/71
Jupiter	RO/RO	13,200	19,100	T-37,000	76
Leslie Lykes	Cargo/Cont.	11,900	14,300	T- 9,900	62/72
Letitia Lykes	Cargo	10,700	14,700	T-15,500	68
Louise Lykes	Cargo	11,000	14,700	T-15,500	65
Lyra	RO/RO	12,200	14,900	D-19,000	77
Mallory Lykes	Cargo	10,700	14,700	T-15,500	66
Margaret Lykes	Container	16,225	15,200	T-15,750	68/73
Marjorie Lykes	Cargo/Cont.	11,900	14,300	T-11,000	62/73
Nancy Lykes	Cargo/Cont.	11,900	14,300	T- 9,900	61/71
Ruth Lykes	Cargo	11,000	14,700	T-15,500	66
Sheldon Lykes	Container	16,375	15,200	D-15,750	69/73
Shirley Lykes	Cargo/Cont.	11,900	14,300	T-11,000	62/72
Stella Lykes	Cargo	10,700	14,700	T-15,500	66
Solon Turman	Cargo/Cont.	11,900	14,300	T- 9,900	61/71
Thompson Lykes	Cargo/Cont.	11,900	14,300	T- 9,900	60/71
Tillie Lykes	Seabee	21,700	38,400	T-36,000	73
Tyson Lykes	RO/RO	23,400	20,300	T-37,000	76
Zoella Lykes	Cargo/Cont.	11,900	14,300	T- 9,900	60/71
MARINE TRANSPORT LINES, INC.					
P.O. Box 1550, Secaucus, NJ 07094					
Alaskan	Chemical tanker	15,288	24,437	T- 9,900	44/66
B.T. Alaska	Tanker	83,650	188,099	T-28,000	78
B.T. San Diego	Tanker	83,650	188,099	T-28,000	78
Chemical Pioneer	Chemical tanker	18,500	35,000	T-15,000	83
Federal Lakes	RO/RO	15,005	19,856	D-18,000	73/85
Federal Seaway	RO/RO	15,005	19,856	D-18,000	73/86
Marine Chemist	Chemical tanker	20,237	35,949	T-15,000	70
Marine Duval	Sulfur tanker	11,080	24,693	TE-7,000	44/70
Marine Floridian	Sulfur tanker	11,150	24,838	TE-7,000	44/67
Marine Princess	Bulk carrier	26,060	51,355	D-13,800	79
Marine Texan	Sulfur tanker	10,066	24,252	TE-7,000	45/64
Sealift Antarctic	Tanker	17,158	27,221	D-14,000	75
Sealift Arabian Sea	Tanker	17,134	27,202	D-14,000	75
Sealift Arctic	Tanker	17,158	27,222	D-14,000	75
Sealift Atlantic	Tanker	17,158	27,214	D-14,000	74
Sealift Caribbean	Tanker	17,158	27,223	D-14,000	75
Sealift China Sea	Tanker	17,134	25,200	D-14,000	75
Sealift Indian Ocean	Tanker	17,134	27,500	D-14,000	75
Sealift Mediterranean	Tanker	17,158	27,717	D-14,000	74
Sealift Pacific	Tanker	17,134	25,200	D-14,000	74
MATSON NAVIGATION COMPANY					
333 Market Street, San Francisco, CA 94105					
Haleakala	Container barge	3,562	4,500	—	84
Islander	Barge	3,403	4,834	—	63
Kauai	Container	23,800	22,539	T-32,000	80
Lurline	Container-RO/RO	23,477	21,321	T-30,000	73/82
Manukai	Container	23,800	27,100	T-32,000	70
Manulani	Container	23,800	27,100	T-32,000	70
Matsonia	RO/RO	15,300	13,900	T-30,000	73
Maui	Container	23,800	27,100	T-32,000	78
Maunalei	Container	17,500	17,900	T- 9,900	44/65
Mauna Loa	Container barge	3,562	4,500	—	84
MOBIL OIL CORPORATION					
150 East 42nd Street, New York, NY 10017					
Mobil Arctic	Tanker	57,800	124,499	T-30,000	72
Mobil Meridian	Tanker	28,200	49,200	T-15,000	61
Syosset	Tanker	18,348	31,816	T-13,500	58
MOORE McCORMACK BULK TRANSPORT, INC.					
One Landmark Square, Stamford, CT 06901					
Mormacsky	Tanker	22,354	39,232	T-15,000	77
Mormacstar	Tanker	22,354	39,232	T-15,000	75
Mormacsun	Tanker	22,354	39,232	T-15,000	76
OCEAN CARRIERS, INC.					
13105 Northwest Freeway, Suite 700, Houston, TX 77040					
Courier	Tanker	21,572	35,100	D-14,000	77
Patriot	Tanker	21,572	35,100	D-14,000	76
Ranger	Tanker	21,572	35,100	D-14,000	76
Rover	Tanker	21,572	35,100	D-14,000	77
OCEAN PRODUCT TANKERS, INC.					
13105 Northwest Freeway, Suite 700, Houston, TX 77040					
Paul Buck	Products tanker	18,000	30,000	D-15,300	85
Gus W. Darnell	Products tanker	18,000	30,000	D-15,300	85
Samuel Cobb	Products tanker	18,000	30,000	D-15,300	85
Richard G. Matthiesen	Products tanker	18,000	30,000	D-15,300	86
Lawrence H. Gianella	Products tanker	18,000	30,000	D-15,300	86
OMI CORPORATION					
280 Park Avenue, New York, NY 10017					
OMI Champion	Product tanker	20,858	37,874	T-15,000	69
OMI Charger	Product tanker	20,877	37,807	T-15,000	69
OMI Columbia	Crude tanker	75,549	136,507	D-27,300	74/83
OMI Dynachem	Chemical tanker	32,328	50,852	D-14,100	81
OMI Hudson	Chemical tanker	32,328	50,852	D-14,100	81
OMI Leader	Product tanker	20,877	37,807	T-15,000	69
OMI Missouri	Bulk carrier	26,800	48,890	D-11,100	83
OMI Sacramento	Bulk carrier	26,800	48,890	D-11,100	83
OMI Wabash	Product tanker	20,884	37,853	T-15,000	69
OMI Willamette	Product tanker	20,884	37,853	T-15,000	69
OMI Yukon	Crude tanker	37,784	81,116	T-24,000	73
OSG BULK SHIPS					
511 Fifth Avenue, New York, NY 10017					
Overseas Alaska	Tanker	28,250	62,000	T-20,000	70
Overseas Alice	Tanker	20,900	37,800	T-15,000	68
Overseas Arctic	Tanker	28,250	62,000	T-20,000	71
Overseas Boston	Tanker	61,200	121,150	D-26,000	74
Overseas Chicago	Tanker	44,850	90,600	T-24,500	77
Overseas Harriette	Bulk	14,300	25,550	D-11,200	78
Overseas Juneau	Tanker	57,700	120,500	T-25,000	73
Overseas Marilyn	Bulk	14,300	25,550	D-11,200	78
Overseas Natalie	Tanker	35,596	68,900	T-23,000	61
Overseas New York	Tanker	44,850	90,400	T-24,500	77
Overseas Ohio	Tanker	44,850	90,550	T-24,500	77
Overseas Valdez	Tanker	20,900	37,800	T-15,000	68
Overseas Vivian	Tanker	20,900	37,800	T-15,000	69
Overseas Washington	Tanker	44,900	90,500	T-24,500	78
POINT SHIPPING CORPORATION					
1211 Avenue of the Americas, New York, NY 10036					
Point Manatee	Bulk Carrier	13,487	21,222	T-12,668	44/70
Point Vail	Tanker	34,594	87,506	D-19,500	64
PRUDENTIAL LINES, INC.					
One World Trade Center, Suite 3701, New York, NY 10048					
Lash Atlantico	LASH	26,406	29,820	T-32,000	74
Lash Italia	LASH	26,406	29,820	T-32,000	74
Lash Pacifico	LASH	26,406	29,820	T-32,000	74

Owner or Operator Name of Ship	Type	GT	DWT	HP T=Turbine D=Diesel	Year Built/ Rebuilt
Santa Adela	Cargo	11,039	13,695	T-18,750	65
Santa Juana	Cargo	11,039	13,695	T-18,750	65
PUERTO RICO MARINE MANAGEMENT, INC.					
P.O. Box 1910, Elizabeth, NJ 07207					
Arecibo	Container	17,977	18,172	T- 9,000	44/69
Atlantic Spirit	RO/RO	17,525	16,144	T-30,000	76/84
Bayamon	RO/RO	15,131	14,180	T-32,000	70
Borinquen	Container	17,189	17,032	T- 9,000	45/66
Caguas	RO/RO	17,513	16,943	T-30,000	74
Fortaleza	RO/RO	15,135	13,969	T-32,000	72
Ponce	RO/RO	17,513	16,943	T-32,000	68/81
Puerto Rico	RO/RO	14,770	14,090	T-30,000	75
San Juan	Container	18,455	17,897	T- 9,000	45/69
SABINE TOWING & TRANSPORTATION COMPANY					
P.O. Box 1528, Groves, TX 77619					
Colorado	Tanker	16,822	30,590	T- 7,240	44/72
Concho	Tanker	18,682	32,741	T- 7,000	45
Guadalupe	Tanker	17,985	30,369	T- 7,240	45/78
Neches	Tanker	20,066	34,930	T- 7,240	43
Pecos	Tanker	17,291	28,749	T-13,750	50
SEA-LAND SERVICE, INC.					
P.O. Box 800, Iselin, NJ 08832					
Adventurer	Container	17,376	15,128	D-17,400	78
Aleutian Developer	Container	4,631	2,296	D- 4,200	60/75
Boston	Container	11,522	9,344	T- 9,900	44/68
Charleston	Container	11,389	9,955	T- 9,900	45/68
Consumer	Container	23,764	25,373	T-32,000	73
Defender	Container	30,085	29,861	D-30,150	80
Developer	Container	30,085	29,818	D-30,150	80
Economy	Container	24,744	23,485	T-32,000	71
Endurance	Container	30,085	29,738	D-30,150	80
Explorer	Container	30,085	29,811	D-30,150	80
Express	Container	30,085	29,943	D-30,150	80
Freedom	Container	30,085	29,831	D-30,150	80
Galveston	Container	11,558	9,201	T- 9,900	45/69
Independence	Container	30,085	29,790	D-30,150	80
Innovator	Container	30,085	29,862	D-30,150	80
Leader	Container	17,376	15,298	D-17,400	78
Liberator	Container	30,085	29,764	D-30,150	80
Long Beach	Container	17,184	16,977	T- 9,900	45/66
Mariner	Container	30,085	29,903	D-30,150	80
Newark	Container	11,522	9,344	T- 9,900	45/68
Oakland	Container	17,184	17,091	T- 9,900	45/66
Pacer	Container	17,376	15,241	D-17,400	78
Panama	Container	17,193	17,014	T- 9,900	45/66
Patriot	Container	30,085	29,748	D-30,150	80
Philadelphia	Container	10,979	9,357	T- 9,900	45/69
Pioneer	Container	17,376	15,246	D-17,400	78
Pittsburgh	Container	18,024	17,906	T- 9,900	45/69
Portland	Container	11,349	9,708	T- 9,900	45/68
Producer	Container	23,764	25,196	D-32,000	74
San Pedro	Container	18,420	17,371	T- 9,900	45/70
St. Louis	Container	18,362	17,904	T- 9,900	45/70
Venture	Container	24,774	23,485	T-32,000	71
Voyager	Container	30,085	29,911	D-30,150	80
SUN REFINING & MARKETING INC., MARINE OPERATIONS					
P.O. Box 2224, Aston, PA 19014					
America Sun	Tanker	37,300	80,700	T-24,000	69
Eastern Sun	Tanker	1,579	3,525	D- 5,800	85
New York Sun	Tanker	19,500	34,400	D-14,200	80
Northern Sun	Tanker	1,533	2,654	D- 1,900	80
Northern Sun II	Tanker	1,579	3,524	D- 2,050	84
Pennsylvania Sun	Tanker	26,300	53,463	T-18,500	59
Philadelphia Sun	Tanker	19,500	34,400	D-14,200	81
Prince Wm. Sound	Tanker	60,084	123,936	T-30,000	75
Texas Sun	Tanker	26,300	53,453	T-18,500	60
Tropic Sun	Tanker	20,177	34,700	T-13,600	57
Western Sun	Tanker	18,800	31,828	T-13,500	54
TANKER MANAGEMENT, INC.					
3820 One Shell Square, New Orleans, LA 70139					
Carole G. Ingram	ITB Tanker	24,500	37,106	D-11,128	72
Martha R. Ingram	ITB Tanker	24,500	36,958	D-11,128	72
TEXACO MARINE SERVICES INC.					
P.O. Box 1028, Port Arthur, TX 77641					
Texaco California	Tanker	23,460	39,249	T-15,000	54/73
Texaco Connecticut	Tanker	23,459	39,366	T-15,000	53/71
Texaco Florida	Tanker	23,459	41,948	T-15,000	56/72

U.S.-FLAG OCEANGOING MERCHANT FLEET AS OF MARCH 1, 1986
(Tonnage in Thousands)

	Total			Privately Owned			MarAd Owned		
	Number	GT	DWT	Number	GT	DWT	Number	GT	DWT
Active Fleet									
Passenger/Pass. Cargo	7	96	55	2	40	14	5	56	41
General Cargo	34	412	506	31	394	480	3	18	26
Intermodal	135	3,493	3,686	135	3,493	3,686	—	—	—
Bulk Carriers (Inc. TBs)	18	451	757	18	451	757	—	—	—
Tankers (Inc. TKB & LNG)	197	6,351	11,833	195	6,337	11,812	2	14	21
Total	**391**	**10,803**	**16,837**	**381**	**10,715**	**16,749**	**10**[1]	**88**	**88**
Inactive fleet									
Passenger/Pass. Cargo	30	418	244	6	99	60	24	319	184
General Cargo	213	1,918	2,475	20	240	280	193	1,678	2,195
Intermodal	35	581	697	23	388	453	12	193	244
Bulk Carriers (Inc. TBs)	8	276	458	8	276	458	—	—	—
Tankers (Inc. TKB & LNG)	57	1,997	3,564	36	1,731	3,132	21	266	432
Total	**343**	**5,190**	**7,438**	**93**	**2,734**	**4,383**	**250**	**2,456**	**3,055**
Combined Active & Inactive									
Passenger/Pass. Cargo	37	514	299	8	139	74	29	375	225
General Cargo	247	2,330	2,981	51	634	760	196	1,696	2,221
Intermodal	170	4,074	4,383	158	3,881	4,139	12	193	244
Bulk Carriers (Inc. TBs)	26	727	1,215	26	727	1,215	—	—	—
Tankers (Inc. TKB & LNG)	254	8,348	15,397	231	8,068	14,944	23	280	453
Total American Flag	**734**	**15,993**	**24,275**	**474**	**13,449**	**21,132**	**260**[2]	**2,544**	**3,143**

[1]Includes five vessels in custody of other agencies. [2]Includes NDR Fleet that consists of 225 ships.
Source: Maritime Administration, U.S. Department of Transportation.

U.S.-FLAG OCEANGOING FLEET

Owner or Operator Name of Ship	Type	GT	DWT	HP T=Turbine D=Diesel	Year Built/ Rebuilt
Texaco Georgia	Tanker	16,514	26,333	T-15,000	64
Texaco Maryland	Tanker	16,514	26,550	T-15,000	63
Texaco Massachusetts	Tanker	16,515	26,547	T-15,000	63
Texaco Minnesota	Tanker	12,171	19,683	TE-7,000	43/64
Texaco Mississippi	Tanker	15,688	26,588	TE-7,000	44/64
Texaco Montana	Tanker	16,584	26,547	T-15,000	65
Texaco New York	Tanker	23,461	39,363	T-15,000	53/72
Texaco Rhode Island	Tanker	16,584	26,547	T-15,000	64
TOTEM OCEAN TRAILER EXPRESS, INC.					
1100 Olive Way, Seattle, WA 98101					
Great Land	RO/RO	17,527	18,115	T-30,000	75
Westward Venture	RO/RO	17,527	18,411	T-30,000	77
TRINIDAD CORPORATION					
7930 Clayton Road, St. Louis, MO 63117					
Admiralty Bay	Tanker	37,800	80,773	T-24,000	71
Aspen	Tanker	37,800	80,569	T-24,000	71
Glacier Bay	Tanker	38,400	80,968	T-24,000	70
UNION OIL COMPANY OF CALIFORNIA					
911 Wilshire Boulevard, Los Angeles, CA 90017					
Blue Ridge	Tanker	21,359	42,268	T-13,000	81
David D. Irwin	Tanker	15,400	25,700	T-12,800	42
UNITED STATES LINES, INC.					
27 Commerce Drive, Cranford, NJ 07016					
American Alabama	Container	42,720	58,907	D-28,000	84
American Altair	Cargo/container	14,001	16,183	T-19,000	65/76
American Apollo	Container	19,127	20,000	T-26,000	70
American Aquarius	Container	19,127	20,100	T-26,000	71
American Argo	Cargo/container	10,500	12,800	T-19,000	64/76
American Astronaut	Container	18,877	20,600	T-26,000	69
American Banker	Cargo/container	16,518	19,272	T-22,000	62/72
American Builder	Cargo/container	16,518	19,871	T-22,000	61/71
American California	Container	42,720	58,907	D-28,000	85
American Draco	Cargo/container	14,001	16,183	T-19,000	65/76
American Entente	Container	28,087	16,634	T-28,500	73/77
American Envoy	Container	28,087	16,982	T-28,500	72/77
American Hawaii	RO-RO/container	34,318	34,075	D-23,000	85
American Illinois	Container	42,720	58,907	D-28,000	85
American Kentucky	Container	42,720	58,907	D-28,000	85
American Lancer	Container	18,765	22,200	T-26,000	68
American Lark	Container	18,887	20,600	T-26,000	69
American Legion	Container	18,165	22,200	T-26,000	68
American Liberty	Container	18,877	21,700	T-26,000	68
American Lynx	Container	18,878	20,600	T-26,000	68
American Maine	Container	42,720	58,907	D-28,000	84
American Marketer	Container	21,150	19,529	T-28,500	73
American Merchant	Container	21,500	19,529	T-28,500	73
American Michigan	Container	34,318	34,075	D-23,000	85
American Monarch	Cargo	13,053	9,493	T-21,000	69
American Nebraska	Container	42,720	58,907	D-28,000	85
American New Jersey	Container	42,720	58,907	D-28,000	84
American New York	Container	42,720	58,907	D-28,000	84
American North Carolina	RO/RO-container	34,318	34,075	D-23,000	84
American Oklahoma	Container	42,720	58,907	D-28,000	85
American Pioneer	Container	28,095	17,124	T-28,500	80
American Puritan	Container	28,095	16,918	T-28,500	80
American Reservist	Cargo	10,500	12,800	T-19,000	64
American Resolute	Container	17,902	16,205	T-17,500	80
American Rigal	Cargo	10,500	12,800	T-19,000	65
American Spitfire	Cargo	13,053	9,493	T-21,000	69
American Titan	Cargo	13,053	9,493	T-21,000	68
American Trader	Container	26,989	29,749	T-32,000	71/77
American Trojan	Cargo	13,053	9,493	T-21,000	69
American Utah	Container	42,720	58,907	T-28,000	85
American Vega	Cargo	10,500	12,800	T-19,000	64
American Veteran	LASH/container	26,456	29,729	T-32,000	73
American Virginia	Container	42,720	58,907	D-28,000	85
American Washington	Container	42,720	58,907	D-28,000	85
VICTORY CARRIERS					
645 Fifth Avenue, New York, NY 10022					
Mount Vernon Victory	Tanker	27,496	49,430	T-15,000	61
Mount Washington	Tanker	27,797	49,395	T-21,500	63
WATERMAN STEAMSHIP CORPORATION					
120 Wall Street, New York, NY 10005					
Major Stephen W. Pless	RO/RO-container	29,091	25,073	T-30,000	83/85
Pfc. Eugene A. Obregon	RO/RO-container	29,091	25,073	T-30,000	83/84
Robert E. Lee	LASH	32,269	40,921	T-32,000	74
Sam Houston	LASH	32,269	40,921	T-32,000	74
Sgt. Matej Kocak	RO/RO-container	29,091	25,073	T-30,000	83/84
Stonewall Jackson	LASH	32,269	40,921	T-32,000	74
WEST COAST SHIPPING COMPANY					
P.O. Box 4258, Los Angeles, CA 90051					
Coast Range	Tanker	21,357	39,990	T-13,000	81
Cornucopia	LPG/Tanker	21,688	21,717	T-13,600	58/78
Sansinena II	Tanker	35,634	71,459	T-18,200	71
Sierra Madre	Tanker	21,357	39,990	T-13,600	81
WESTERN HEMISPHERE CORPORATION					
P.O. Box 2401, Santa Monica, CA 90406-2401					
Lion of California	Tanker	10,473	16,692	T- 7,000	54

Henry M. Walsh

CANADIAN SHIPBUILDING— REVIEW AND OUTLOOK

By Henry M. Walsh, President
Canadian Shipbuilding and
Ship Repairing Association

During the past four years (1982-1985), the grand total of new commercial orders received by shipyard members of the Canadian Shipbuilding and Ship Repairing Association (CSSRA) amounted to 62,600 gross tons, an average of 15,650 gt per year, in comparison with 106,100 gt in 1981 and 164,100 gt in 1980. The commercial orderbook at the end of 1985 was 33,800 gt, including three ferries totaling 29,900 gt for government service. The remainder, three vessels totaling 3,900 gt, were on order or under construction for nongovernment organizations. The three vessels were a drydock for Allied Shipbuilders' own account, a scallop dragger at Pictou Industries, and an offshore support vessel, virtually completed, built on speculation at Marystown Shipyard.

At the end of 1985 there were still some 14 ships being built under the federal government's 1983 Special Recovery Capital Projects program for the Canadian Coast Guard and Fisheries and Oceans. This program has kept most of the Canadian shipyards in new construction during the past two years, but the work is coming to an end. By late summer this year only two vessels will remain to be completed. By the end of 1986, the only other new work in hand will be the Canadian Patrol Frigates and the second Caribou type ferry for CN Marine at Versatile Davie; that contract was awarded in April this year.

Other government work is pending, including the Polar 8 icebreaker, four submarines under the Canadian Submarine Acquisition Project, about C$100 million for small warships, the Tribal Class destroyer refit and modernization project, and the second batch of Canadian patrol frigates. Most of these programs were scheduled for approval in 1984 or 1985; the go-ahead notices will be warmly welcomed when they are announced.

Reflecting the decrease in demand, foreign-built vessels brought into Canadian registry fell off sharply in 1985—only seven ships totaling 8,233 gt against 18 ships totaling 235,975 gt in 1984. The CSSRA, following its semiannual General Meeting in November 1985, called on the Canadian government to announce a moratorium on all foreign-built vessels being brought into Canadian registry. This would insure that the present meager Canadian domestic demand remains in Canada. The Association also called on the government to honor its preelection promises, including the reimposition of duty on foreign-built fishing vessels over 100 feet, and concessionary financing for Canadian ships in domestic service.

Repairs and conversions in 1985 for government account were maintained at recent levels. Commercial repairs and conversions, however, decreased by 14 percent from 1984, and at C$131,204,000 was the lowest since 1978. This is a reflection of the shipping industry's financial difficulties worldwide. The outlook for the repair industry in 1986, both commercial and government, is clouded by the government's decision to allocate work previously done in commercial yards to the Naval Ship Repair Units in Halifax and Esquimalt. The CSSRA believes this practice is in direct conflict with the government's policy to privatize government operations.

Most of the Allied Industries members of the CSSRA have experienced a decline in work, with the exception of those involved in supplying components or services for the Canadian Patrol Frigate program. There are now a record 85 Allied Industries members in the Association. Value of production for these members increased 3.8 percent during the past year; much of this production was for naval programs.

In recent months, substantial government intervention and support through grants, low-interest loans, quotas, and tax breaks has been provided to the banking and fishing industries, the wheat farmers, the automobile industry, and the petroleum industry. In some cases, the government has justified this support by saying that the survival of these industries was in jeopardy because of low-cost subsidized competition from abroad. The Canadian shipbuilding industry's future is subject to similar forces, and has been for the past several years. The CSSRA feels that it too merits attention and action, and urges the government to:

- Impose a moratorium on ship imports for domestic use;
- Introduce concessionary financing for Canadian domestic ships;
- Apply 25 percent tariff on fishing vessels over 100 feet; and
- Accelerate naval programs and the Polar icebreaker program.

Shipbuilding and Ship Repairing Industry
— Statistical Highlights 1980–1984 —

	1980	1981	1982	1983	1984
Order Book (Gross Tonnage)	353,100	309,900	208,900	171,000	151,700
Order Book (Compensated Tonnage)	348,400	512,500	326,300	407,600	353,400
New Orders—Commercial (Gross Tonnage)	163,900	106,100	7,600	17,900	29,200
New Orders—Government (Gross Tonnage)	1,300	200	—	52,900	6,500
New Orders During Year (Gross Tonnage)	165,200	106,300	7,600	70,800	35,700
Deliveries (Gross Tonnage)	106,500	163,100	115,400	112,300	51,800
Value of New Construction ($,000)	476,651	481,782	652,918	381,743	288,204
Value of Repairs and Conversions ($,000)	207,108	313,700	296,228	204,222	250,685
Value of Shipyard Production ($,000)	683,759	795,482	949,146	585,965	538,889
Estimated Value of CSSRA Allied Industries Production ($,000)	135,750	155,000	151,000	153,500	155,875
Total Value of CSSRA Shipyard and CSSRA Allied Industries Production ($,000)	819,509	950,482	1,100,146	739,465	694,764
Value of Shipyard Production on Foreign Account ($000)	179,982	156,994	301,489	135,067	59,251
New Construction—Fed. Gov't ($,000)	29,100	49,232	28,620	32,837	115,663
Repairs & Conversions—Fed. Gov't ($,000)	48,564	69,801	81,345	58,433	87,426
New Construction—Commercial ($000)	447,551	432,550	624,298	348,906	172,541
Repairs and Conversions—Commercial ($000)	158,544	243,899	214,883	145,789	163,259
Employment	14,599	15,305	15,205	11,300	9,433
Average Weekly Earnings ($)	396.51	456.77	512.78	547.25	559.19
Average Hourly Earnings ($)	9.84	11.16	12.68	13.69	14.14
Dollar Output Per Employee ($)	59,926	66,584	79,520	75,172	76,743
Shipments of Domestic Rolled Steel to the Industry (Tons)	42,500	27,800	25,600	18,600	20,800 (Oct. 31)
Value of Exports ($,000)	360,437	210,931	310,431	179,799	234,075
Value of Imports ($,000)	312,143	526,789	281,824	778,144	640,082
Foreign Built Vessels Registered in Canada (Gross Tonnage)	70,549	143,711	48,750	198,743	235,975
(Number of Vessels)	31	35	22	38	18

There's a WESTFALIA system for every oil purification need

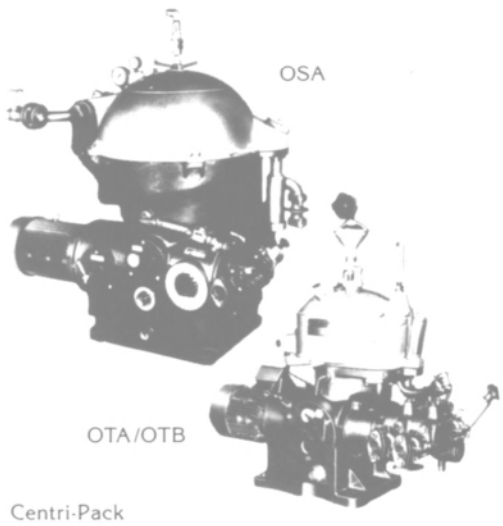
Highest oil purity.
Westfalia Oil Purifiers remove water and sediment from heavy fuel oils at top efficiency. . . at densities up to *1010 kg/m³* and cat fines down to 1 ppm. Our *exclusive* two-stage *UNITROL/SECUTROL* system gives unmatched purity even under *widely varying feed conditions.*

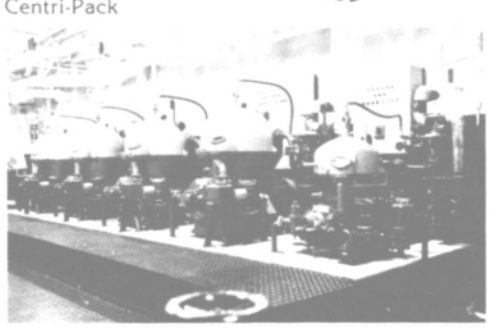
UNITROL performs the basic oil/water/solids separation on oils both lighter and heavier than water. SECUTROL assures maximum solids and water removal. . . while monitoring de-sludging intervals. Together, they provide the *highest HFO quality now obtainable.*

Complete monitoring.
Westfalia systems allow monitoring of such vital functions as oil flow, oil temperature, increased water discharge, oil break-over, failure to shoot, motor temperature, vibration, and excessive number of second-stage solids or water discharges. Control stations, with audible and visual alarms, can be located remotely and/or at the equipment site.

Whether your engines are powering a huge ocean-going cargo vessel or a small service boat, there's a Westfalia Oil Purification System that suits them best.

Westfalia Oil Purifiers — self-cleaning OSA/OSB models and take-down OTA/OTB models — are available for all oil purification needs in any shipboard application.





Top reliability.
Built-in ruggedness and sturdy design give Westfalia Oil Purifiers a record of reliability unmatched by any competitive system. . . perfect for tough marine service conditions.

Preassembled modules.
Westfalia Oil Purifiers are available as single machines or as preassembled "Centri-Pack" modules, with heaters, pumps, strainers, controls, wiring, etc. installed and ready to go.

Rapid, expert service.
With every Westfalia Oil Purification System you get Centrico expertise, to help design, install, and service your equipment. At any port — Atlantic, Pacific, Gulf — skilled engineering advice and assistance, as well as parts, are usually available overnight — or sooner.

Westfalia systems and Centrico service. . . in any engine room, they're the best answer for your oil purification requirements.

WESTFALIA SEPARATOR

Centrico, Inc.
100 Fairway Court / Northvale, N.J. 07647
(201) 767-3900

Circle 162 on Reader Service Card

World Shipping And Shipbuilding

According to the Annual Report of Lloyd's Register of Shipping, events during 1985 offered little to the world's shipping and shipbuilding industries, and there were few indications of any real improvements in the foreseeable future.

The world merchant fleet declined last year to 416.3- million gt, bringing the total back to the level of 1980. This situation was brought about by the excess of tonnage scrapped (20-million gt) to that completed (18-million gt).

Laid-up tonnage decreased during 1985 to a level of 26.5-million gt. More than half of that total comprised ships less than 10 years old and was mostly tanker tonnage.

New orders reported during last year declined by about 17 percent compared with 1984, from 15.6-million gt to 13-million gt. This has reduced the current world orderbook to 26-million gt, compared with the 30-million gt recorded at the same time a year earlier.

Gains And A Changing Fleet

During the past five years, the composition of the world fleet has changed dramatically, with tanker tonnage falling from 42 percent to 33 percent. In that period, the emphasis has been on developing the world's dry cargo and specialized trading fleets. Bulk carrier tonnage has grown in this period from just over a quarter of the total world fleet to almost a third, while substantial gains have occurred in the liquefied gas carrier and specialized containership fleets.

The age structure of the world fleet has also changed. In 1980 almost 60 percent of the tonnage was less than 10 years old, compared with 45 percent of the current fleet—the result of early scrapping of very large tankers. The world tanker fleet reached a peak in the late 1970s and has been in a decline since then. In 1985, just over 40 percent was less than 10 years old, compared with almost 68 percent in 1980. On the other hand, bulk carrier tonnage continues to expand, with almost half of the existing fleet less than 10 years old.

Tonnage delivered during 1985 included a number of interesting additions to the world fleet, including several cruise ships and big passenger ferries. With the purpose-built containership and vehicle carrier now exceeding 50,000 gt, and craneships and other sophisticated types of ships exceeding 30,000 gt, the economy of scale concept is spreading rapidly into almost every type of commercial trading vessel. This overcapacity, particularly in the containership sector, has had a further effect on already low freight rates and market conditions.

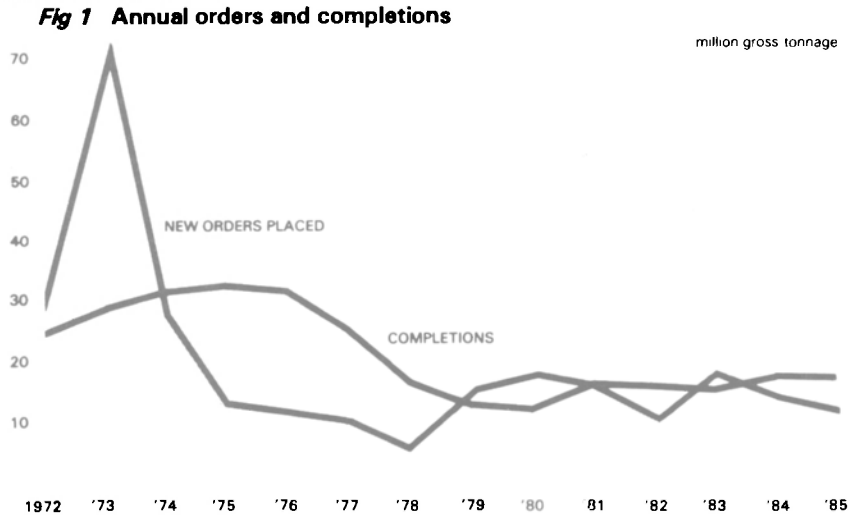
World Orderbook

An analysis of the orderbook at the end of 1985 shows that 48 percent of the tonnage on order is for ore carriers and other bulkers, 22 percent is for tankers, and nine percent for containerships. Few orders being placed now are for delivery beyond mid-87.

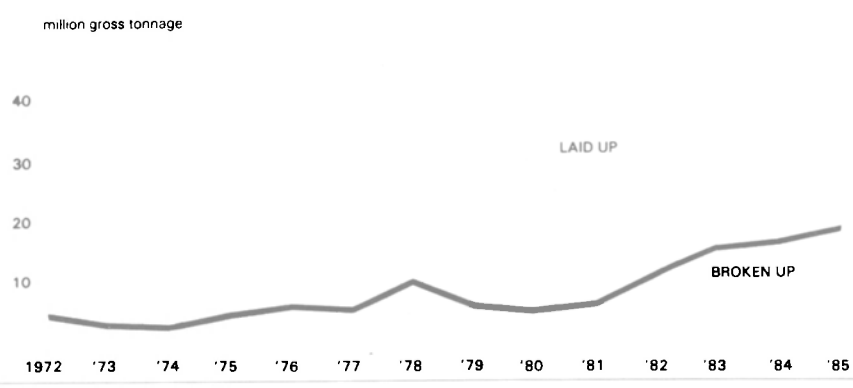
As the volume of tonnage in the shipbuilding orderbook shrinks, particularly in the shipyards of Western Europe, the yards in the Far East continue to secure the major share of the orders for new ships. Japan again dominated the market by securing 50 percent of the new ship orders, followed by the Repub-

(continued)

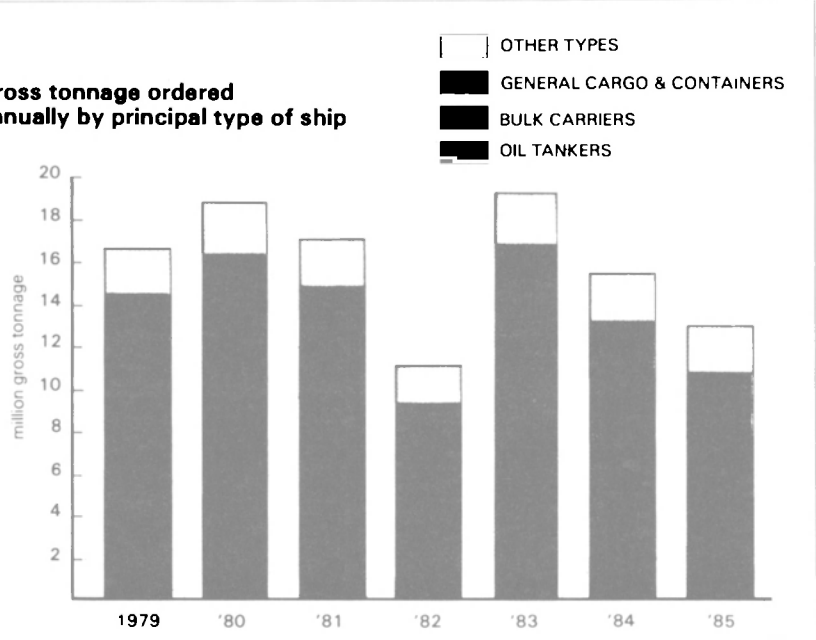
Fig 1 **Annual orders and completions**



Tonnage laid up and broken up



Gross tonnage ordered annually by principal type of ship



Summary of Merchant Vessels, 100 Gross Tons and Over, Completed During 1977-1985 by Country Where Built

Country	1977	1978	1979	1980	1981	1982	1983	1984	1985
Denmark	53	46	46	53	45	46	48	46	39
France	39	42	33	25	35	37	37	36	25
Germany (East)	51	55	56	50	54	52	55	58	59
Germany (West)	157	134	97	105	99	106	130	109	135
Italy	44	37	34	46	51	30	41	30	30
Japan	1,107	1,046	993	943	839	800	755	902	817
Netherlands	97	89	98	82	103	107	126	68	90
Norway	138	140	113	80	70	80	61	39	57
Poland	72	66	68	64	40	40	39	52	44
Spain	149	120	99	74	86	105	106	92	58
Sweden	40	36	32	27	33	25	24	13	20
United Kingdom	94	91	86	68	46	59	60	46	35
United States	129	151	182	205	223	204	159	73	66
Yugoslavia	19	19	29	23	17	23	15	21	36
Rest of the World	607	546	500	567	528	598	620	625	453
World Totals	**2,796**	**2,618**	**2,466**	**2,412**	**2,269**	**2,312**	**2,276**	**2,210**	**1,964**

Source: Lloyd's Register Annual Summary of Merchant Ships Completed During 1985

Source: Lloyd's Register of Shipping and Maritime Reporter/Engineering News

(continued)

lic of Korea with 11 percent and the People's Republic of China and Taiwan with six percent.

Japanese shipyards secured some interesting contracts last year, including a 31,000-gt passenger ferry, the first vessel of its kind to be built there for a European owner. Notable in the Japanese orderbook is the large number of vehicle carriers (22) ordered in 1985 to support the automobile and truck export trade. Other ship types ordered included wood chip carriers and large containerships as well as, despite the slump in the tanker market, two very large crude carriers at the IHI and Mitsubishi yards. However, the announcement that Hitachi Zosen will cease construction of ships at its Innoshima Works in early 1987, and that many other major Japanese shipyards are making large cuts in their work forces, indicates how the recession has affected even the world's most successful shipbuilding nation.

Korea also encountered difficulty in maintaining the fierce competition for new orders that it had shown in recent years. Contracts secured during 1985 were greatly reduced, and the relative absence of a significant domestic market constitutes a major problem for shipbuilding stability. Some help came from recent substantial financial backing for Korean shipowners.

Nevertheless, Korea obtained orders from a series of five 2,640-TEU containerships for Panamanian flag, three of 2,358 TEU for domestic registration, three 63,400-dwt bulk carriers for a U.S. owner, and a share with China and Finland of an order for five 117,500-dwt tankers for Norway.

In the People's Republic of China, a variety of different ship types was ordered including tankers, bulk carriers, large dredges, and general cargo ships. In Taiwan, the third of a series of 305,000-dwt ore/oil carriers was confirmed for Liberian registration, as well as large bulk carriers and containerships for Taiwanese owners.

Shipyards in the United Kingdom received contracts that included a 31,000-gt passenger ferry at Govan similar to the one ordered in Japan. A floating oil production, storage and transport system was ordered at Harland & Wolff for BP Shipping, and a 28,500-gt craneship with a lifting capacity of 4,000 tons at Sunderland for U.K. registration. However, few U.K. shipyards have contracts extending beyond the end of 1986.

Almost all shipbuilders in Western Europe are finding it difficult to secure work, even for the short term. Only two ships of any significant size are on Norway's orderbook. In Sweden, where the Uddevalla shipyard is due to close at mid-86, Kockums AB will remain the only major commercial shipbuilder, and that Malmo yard has announced plans to concentrate on naval construction after phasing out the production of merchant ships by 1988.

Finnish shipyards, well known for their versatility, received orders for a 24,000-gt passenger ferry and a 117,500-dwt tanker for Norwegian owners, and a 25,000-gt semisubmersible deck cargo ship for the USSR. Valmet shipyard recently delivered the 21,000-gt passenger vessel Birka Princess to Birka Line AB.

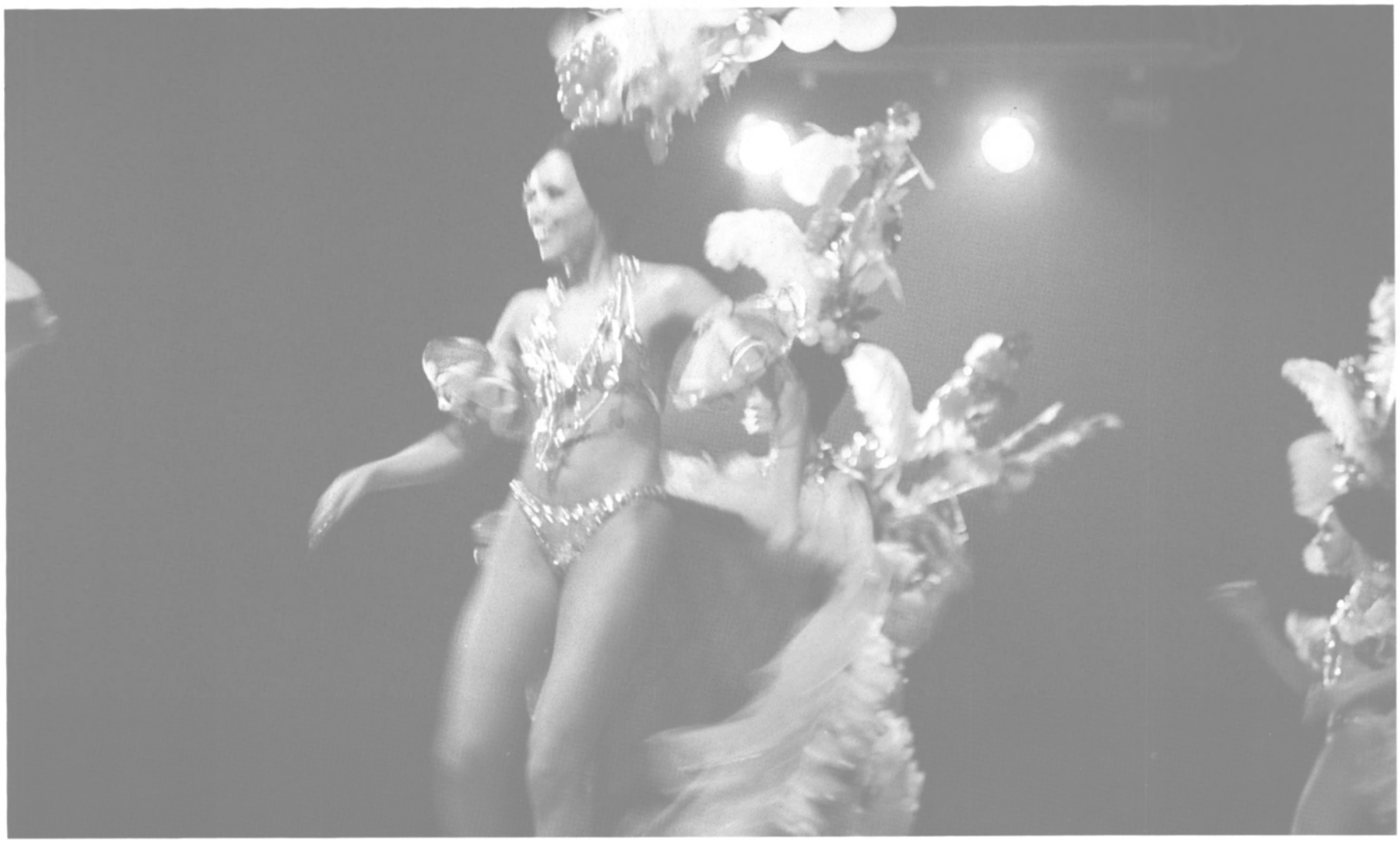
Danish, Belgian and Netherlands shipyards all found the securing of substantial work difficult. A program to rationalize the shipyards in Spain is underway in an effort to reduce capacity and increase efficiency.

Successful Areas

Among the more successful shipbuilding countries was Yugoslavia, where yards won orders for medium-size bulk carriers and tankers, vehicle carriers, and dry cargo ships, most of which are for export. Yugo-

(continued)

AIR ON A G-STRING



Everyone loves a good cabaret. And the better the show, the better the atmosphere. Or is it? Shipboard entertainment makes heavy, and often unpredictable demands on your ship's climate control systems. And if the system is not up to it, the show could get hotter than intended.

Which is why the design of an increasing number of cruise ships wisely incorporates a Flakt Climate Control System. A system designed to maintain a comfortable climate on board, regardless of the ambient temperature and humidity. Using the latest energy recovery techniques to give tangible cost savings. And our systems not only contribute to passenger (and entertainer!) comfort, they also create a safe working environment for the crew and for vital equipment from the engine room to the bridge and from the kitchens through to the living quarters.

We've been specialists in climate control and ventilation for half a century. We understand your requirements. And we understand that your needs tomorrow will be different from those today. Which is why we're pleased to boast the world's largest R&D organization devoted solely to air treatment and climate control. That's one reason why Flakt solutions are always so innovative. Try us.

Flakt
Marine AB

FOR THAT BREATH OF FRESH AIR

P.O. BOX 8862, S-402 72 GOTHENBURG, SWEDEN. TEL. INT. +46-31 22 20 60

ARGENTINA · AUSTRALIA · AUSTRIA · BELGIUM & LUXEMBOURG
BRAZIL · CANADA · CHILE · DENMARK · EGYPT
FEDERAL REPUBLIC OF GERMANY · FINLAND · FRANCE · GREECE · HONGKONG
INDIA · ITALY · JAPAN · THE NETHERLANDS · NORWAY
PAKISTAN · PEOPLE'S REPUBLIC OF CHINA · PORTUGAL · REPUBLIC OF KOREA · REPUBLIC OF SINGAPORE
SPAIN · SWEDEN · TAIWAN · TURKEY · UNITED KINGDOM
UNITED STATES · VENEZUELA · YUGOSLAVIA

Circle 214 on Reader Service Card

Please reveal the secrets of Flakt Climate Control

MR

NAME

POSITION

COMPANY

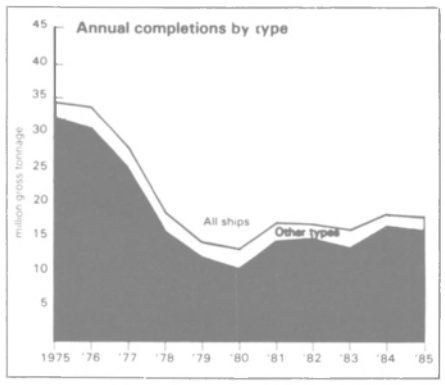
ADDRESS

COUNTRY

(continued)

slavia has just announced a fleet modernization program that would add 158 new and second-hand ships to the country's merchant marine. Of the 80 new buildings included in the plan, 57 would be ordered from domestic yards, with the contracts for the other 23 going to overseas shipbuilders.

French shipyards have achieved a measure of success, mostly with help of government assistance. Chantiers de l'Atlantique in St. Nazaire won a number of orders, including a cruise ship of about 70,000 grt for Royal Caribbean Cruise Line of Miami, scheduled for delivery in December 1987. To be named Sovereign of the Seas, she will be the largest passenger vessel ever built in terms of tonnage and capacity, with accommodations for 2,276 passengers.



Government aid is also helping Italian shipyards in their quest for work, as it is in the Federal Republic of Germany, where yards have been successful in obtaining a number of high-value orders for passenger ships, ferries, and liquefied gas carriers for both domestic and export markets. Negotiations for an $864-million order for three frigates for the Portuguese Navy have been under way in Hamburg, with plans calling for two to be built at the HDW yard in Kiel and one at the Blohm & Voss in Hamburg.

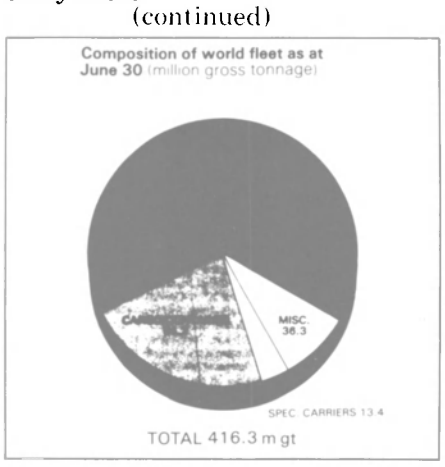
Almost all the tonnage ordered from Eastern Block countries (more than nine percent of the world total) was for home ownership. It included several large tankers in Romania and the usual assortment of tonnage for the USSR. Among the unusual orders that Russia placed in Western shipyards were those for eight cargo liners at Malta Drydocks, and four 4,800-cubic-meter refrigerated cargo vessels at Hellenic Shipyards in Greece.

Brazilian shipyards, which in recent years have proven formidable competitors for European tonnage, encountered financial difficulties that hampered efforts in the export market. The only significant tonnage ordered there was for large bulk carriers for domestic account.

In the United States, the ongoing U.S. Navy construction and modernization program calls for the expenditure of $ billions annually in private U.S. yards. In addition, conversions, repair work and an increasing demand for smaller vessels at U.S. shipyards such as fishing boats, dinner/cruise/excursion craft, and offshore supply vessels accounted for additional work.

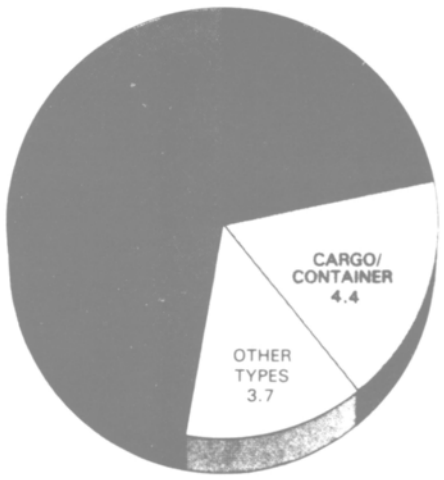
The small-vessel sector of shipbuilding internationally was quite successful, with orders almost everywhere.

(continued)



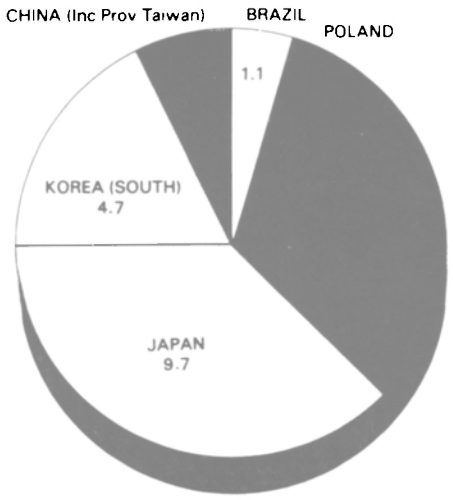
WORLD SHIPBUILDING

Total orderbook by ship type as at December 31 (million gross tonnage)

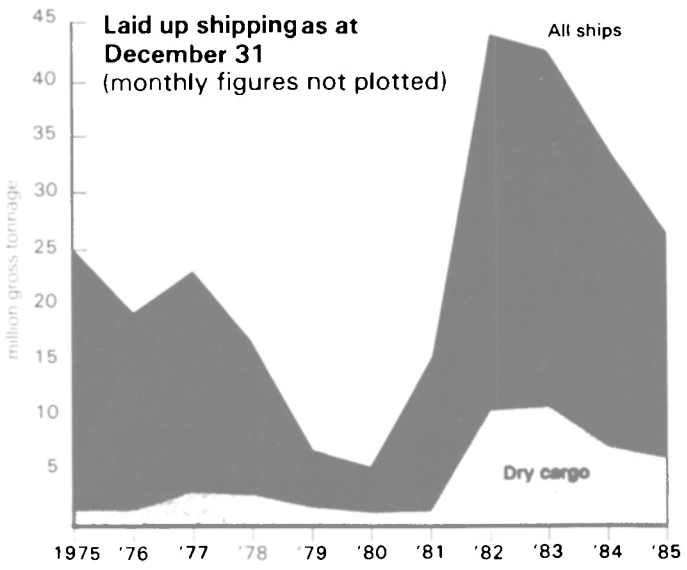


TOTAL 26m gt

Total orderbook by leading countries as at December 31 (million gross tonnage)



TOTAL 26m gt



Percentage of new orders placed

Year	Japan %	Korea (South) %	E E C. %	Comecon %	Rest of World %
1975	49.25	3.72	13.44	8.37	25.22
1976	56.01	2.47	10.56	10.00	20.96
1977	52.13	5.67	13.11	7.96	21.13
1978	43.25	3.71	14.89	11.49	26.66
1979	49.47	6.20	14.02	6.82	23.49
1980	52.66	8.96	12.11	4.22	22.05
1981	48.00	8.08	14.04*	6.06	23.82
1982	49.75	9.57	13.47*	9.44	17.77
1983	56.56	19.21	7.40*	5.14	11.69
1984	56.73	14.69	9.95*	3.75	14.88
1985	49.82 est.	10.83 est.	13.52* est.	9.29 est.	16.54 est.

Annual orders and completions

Year	Annual volume of orders placed	Annual completions
	thousand gross tonnage	
1975	13 793	34 203
1976	12 937	33 922
1977	11 091	27 532
1978	8 026	18 194
1979	16 843	14 289
1980	18 969	13 101
1981	17 230	16 932
1982	11 232	16 820
1983	19 480	15 911
1984	15 594	18 334
1985	13 000 est.	18 000 est.

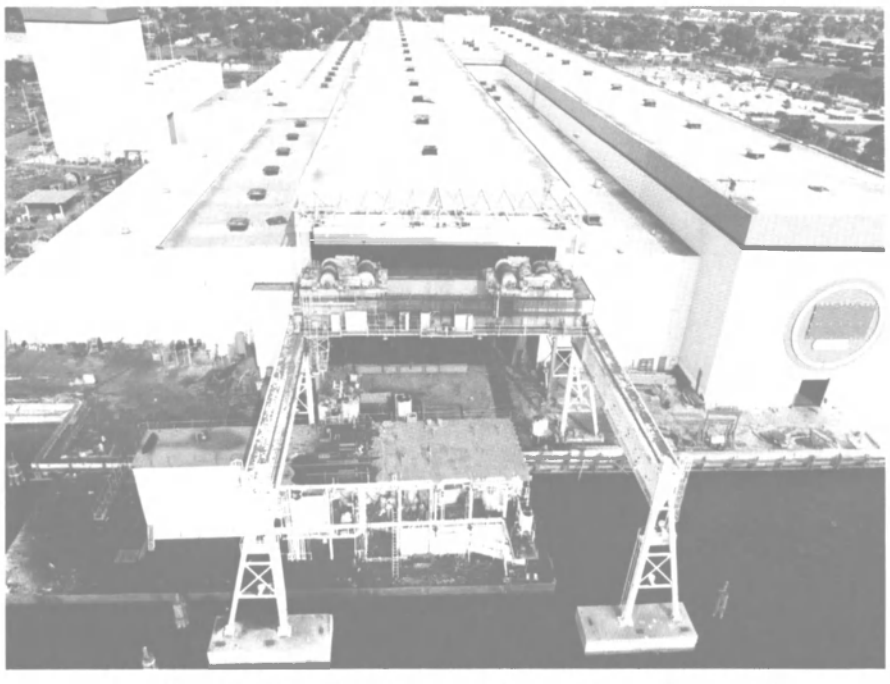
Percentage of orders placed in principal shipbuilding countries

Country of build	1978	1979	1980	1981	1982	1983	1984	1985
Japan	43.3	49.5	52.7	48.0	49.7	56.6	56.7	49.8
Korea (South)	3.7	6.2	9.0	8.1	9.6	19.2	14.7	10.8
China, People's Republic of } Taiwan, Province of †	3.5	2.6	3.7	5.4	2.6	2.8	5.6	5.9
Germany, Federal Republic of	3.6	4.4	2.2	4.4	4.4	2.4	3.2	5.5
Romania	0.8	0.3	1.3	2.0	2.0	–	0.4	4.8
Yugoslavia	2.0	2.8	1.7	0.7	2.4	1.2	0.6	3.0
Italy	2.7	1.0	1.6	0.5	2.6	0.2	0.3	2.8
Brazil	3.7	2.7	0.3	3.3	2.7	1.7	2.3	2.1
Poland	6.3	4.6	1.0	0.9	1.7	2.1	0.9	2.1
France	1.4	1.5	1.7	1.9	0.9	0.7	0.6	2.0
Bulgaria	0.9	1.1	0.8	1.1	1.1	0.6	0.7	1.6
United Kingdom	1.9	1.4	2.7	2.9	2.5	0.6	1.0	1.4
Finland	1.5	1.6	1.5	1.8	1.0	0.4	2.1	1.3
Netherlands	2.0	0.7	1.2	1.2	1.2	0.6	1.0	1.0
India	0.0	0.3	0.7	0.8	0.1	0.2	0.1	1.0
Spain	2.4	4.4	5.2	5.3	1.6	1.1	0.3	0.9
Turkey	0.4	0.1	0.0	0.3	0.5	0.1	0.5	0.9
Rest of the World	19.9	14.8	12.7	11.4	13.4	9.5	9.0	3.1
World	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gross tonnage	8 025 679	16 843 354	18 969 044	17 230 094	11 231 759	19 480 030	15 593 541	13 000 000 est.

A DISTINCTIVE SHIP

The vessel ——— one of the five, 615′, 30,000 DWT Product Tankers built by Tampa Shipyards Incorporated steams across the Gulf of Mexico on her maiden voyage. These tankers, delivered three weeks ahead of schedule, incorporate a new generation of hull lines and efficient operating economy.

A DISTINCTIVE SHIPYARD



The fabrication facility—11 acres under roof with a 700 ton bridge crane.

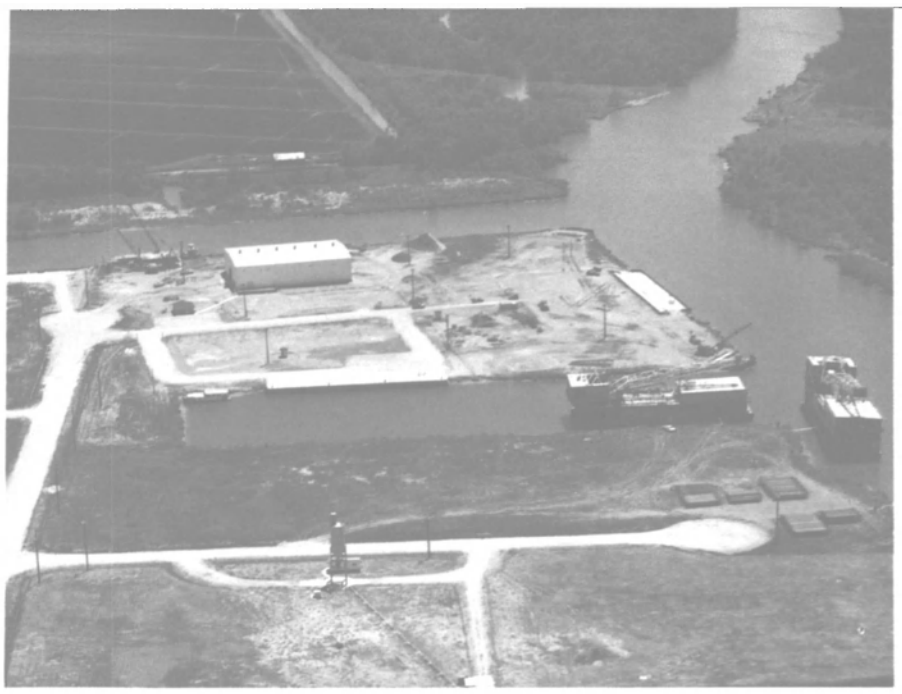
The erection & assembly building—600′ x 145′ x 115′ with three-250 ton bridge cranes—spans 350′ of Dry Dock No. 4.

TAMPA SHIPYARDS INCORPORATED

P.O. BOX 1277 TAMPA FLORIDA 33601 (813) 247-1183 Telex 52-637

A SUBSIDIARY OF THE AMERICAN SHIP BUILDING COMPANY

Circle 168 on Reader Service Card



Port of Iberia Inaugurates New Public Dock Facility —Literature Available

The Port of Iberia in Louisiana has just opened a new public dock facility, financed by appropriations from the state legislature. The new facility has been planned as a drawing card to aid in the port's efforts to diversify its resident industries and occasional users of the dock and warehouse facilities.

"We're only six miles from the Gulf Intracoastal Waterway, probably the most important inland waterway in the nation in terms of freight tonnage transported," port director **John Oubre** notes, "and storage and docking space so close could be important to any number of industrial plants and suppliers." In addition, Sterling Sugars, Inc. of Franklin, La., has some 4,000 acres of adjacent land available for rapid development into new industrial waterfront plant sites.

Phase I of the Port of Iberia public dock project, priced at $380,888 and virtually completed, includes 200 feet of steel bulkheading along the dock area's No. 4 slip, as well as a concrete loadout slab, an operations building, parking areas, roads, and security fencing.

The facility's second phase, to cost $518,586, includes additional steel bulkheading on the Commercial Canal frontage, plus security lighting, restrooms, a sewage plant and water well, and water and power lines.

Phase II of the project, now in its final weeks, covers construction of a 15,000-square-foot steel building, plus waterfront bulkheading, a concrete loading dock, and other work, at a cost of $650,587. The 100 by 150 foot warehouse building, constructed on a concrete slab, provides for later additions of offices, overhead cranes, and refrigerated space.

According to Mr. **Oubre,** inquiries as to local freight handling facilities and rates for warehouse services have already been received from shipping companies, freight forwarders, and other marine transportation interests. One of them, Lykes Bros. Steamship Company of New Orleans, has inquired relative to the delivery of large steel boilers from West Germany, weighing from 95 to 128 tons, destined for the new Agrifuels Refining Company's ethanol plant under construction near New Iberia.

The port director noted that in an effort to make the facility more useful to present and prospective tenants and others using the Port of Iberia, an application has been filed with the U.S. Army Corps of Engineers to dredge a 16-foot-deep navigation channel directly across Vermilion Bay to the Gulf of Mexico. To support this application in the face of possible opposition from wildlife, coastal protection, and other groups, the Port of Iberia commissioners recently signed a contract with Louisiana State University's Ports and Waterways Institute for a five-month environmental assessment study of the trans-Vermilion channel project.

For additional information on the Port of Iberia,

Circle 45 on Reader Service Card

Amhoist Announces $33 Million In Crane And Puller Orders

Amhoist of St. Paul, Minn. (American Hoist & Derrick Company), recently received orders for nine revolver cranes and two large puller systems totaling approximately $33 million for its crane division from Newport News Shipbuilding, Ingalls Shipbuilding, and Placid Oil Company.

Ingalls ordered seven traveling gantry cranes to replace units destroyed during hurricane Elaina's passage last year. Newport News purchased its cranes and puller system as part of the expansion program for a nuclear submarine assembly facility. And Placid Oil's puller system is for mooring a large offshore production platform.

Ingalls ordered three 300-ton revolver cranes that will be the largest of their class in the U.S. The Pascagoula, Miss., yard also ordered four 100-ton gantries, while Newport News purchased 50-ton units. The 300- and 100-ton cranes incorporate direct gear hoist arrangements with enhanced swing and travel capabilities for high wind operating conditions. Able to withstand 175-mph winds, the gantries have tubular tower structures and box girder structural design features.

The 50-ton revolver cranes scheduled for the Newport News yard include many of the design features of the larger capacity cranes such as the self-diagnostic digital controls and direct-gear, single-layer winches. They also have level-luffing capability.

Placid Oil will utilize eight 1½-million-pound capacity pullers to moor a first of its kind oil production platform offshore.

All of the orders are scheduled for delivery in late 86 and early 87.

For additional information on Amhoist cranes and pullers,

Circle 61 on Reader Service Card

Hancock Succeeds Loftus As Comptroller And Deputy Commander Of NAVSEA

Capt. **James E. Hancock** has been assigned as deputy commander/comptroller of the Naval Sea Systems Command (NAVSEA), succeeding Rear Adm. **Stephen F. Loftus.**

Headquartered in Arlington, Va., NAVSEA is responsible for the design, development, acquisition and life-cycle maintenance and modernization of the Navy's ships and shipborne weapons systems. The organization encompasses 59 field activities, including eight Naval Shipyards, and employs more than 100,000 people. NAVSEA manages about one-third of the Navy's annual budget.

Captain **Hancock** served on the staff of the Chief of Naval Operations from 1976 to 1980, and then in the office of the comptroller until January 1985. He was then assigned as deputy auditor general of the Navy, the position he held until joining NAVSEA.

The next assignment for Admiral **Loftus** will be as commander, fleet air-Mediterranean in Naples, Italy. He has served as NAVSEA deputy commander/comptroller since October 1984.

Gastech 86 Scheduled For November In Hamburg —Free Program Available

The 12th International LNG/LPG Conference and Exhibition, Gastech 86, will be held in the Congress Centrum, Hamburg, West Germany, from November 25-28. The conference program is now available from the organizers as well as a registration form and booking information for travel and hotels.

The active business climate generated by the internationally minded community in Hamburg will provide a positive background to the Gastech 86 meeting.

Brian Singleton, conference director for Gastech 86, announced the Senate of the Free and Hanseatic City of Hamburg will host a welcome party for all participants on Tuesday, November 25. The official Gastech cocktail-buffet party will be held on Wednesday, November 26, and all registered delegates and their spouses will be invited. Full details of both events will be provided for all registrants closer to the meeting date.

Early registration is necessary to secure rooms in the listed hotels, particularly in the headquarters hotel, the CP Hamburg Plaza, which adjoins the Congress Centrum. Rooms will be alloted on a first-come, first-served basis from the blocks of rooms held for Gastech participants.

Gastech 86 is officially the first meeting in the new biennial schedule, the next Gastech conference being scheduled for 1988.

For a free copy of the conference program, write to **Brian Singleton,** conference director, Gastech Ltd., 2 Station Road, Rickmansworth, Herts WD3 1QP, England, or telephone Rickmansworth (0923) 776363, or telex 924312 Gastec.

Technical Report On Liner And Bulk Planning Systems Offered By MarAd

The Maritime Administration has announced the availability of a three-volume technical report, "Microcomputer-Based Planning System for Liner and Bulk Shipping Operators."

Under a MarAd research and development contract, Temple, Barker and Sloane, Inc. (TBS) of Lexington, Mass., developed two separate systems—one for liner vessels and the other for bulk carriers. Each system provides easy-to-use tools for evaluating various factors that are critical to strategic planning.

Lykes Bros. Steamship Company assisted TBS in developing the system for liner operators. The American Steamship Company, GARD, Inc., and Marine Transport Lines assisted with the bulk operator system.

Copies of the report may be obtained from the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161. Order numbers and prices are: Executive summary, PB86-159902/AS, $9.95; User's Guide (Liner Operators), PB86-159910/AS, $16.95; User's Guide (Bulk Shipping Operators), PB86-159928/AS, $16.95.

Computer programs for each of the systems are available on diskettes from Temple, Barker and Sloane. Information on how to order these is available from MarAd; contact **John Dumbleton** at (202) 382-0350.

Todd's San Pedro Yard Gets Preliminary Approval As Foreign Trade Subzone

The Long Beach Harbor Commission has granted the San Pedro yard of Todd Pacific Shipyards Corporation permission to ask the U.S. Department of Commerce for approval to become part of the Port of Long Beach Foreign Trade Zone No. 50. Such a status would allow the shipyard to import articles without paying normal customs duties.

According to **Len Thorell**, Todd vice president and general manager of the San Pedro yard, foreign trade zone status would make the facility more competitive with foreign shipyards. During the past year, Todd has been trying to acquire shipbuilding contracts from friendly foreign countries.

Frank McElhill, director of administration at the San Pedro yard, estimates that it could take from four to six months before the Commerce Department rules on Todd's application.

Beclawat Offers Windows & Doors For Ships And Rigs —Literature Available

Beclawat (Ontario) Ltd. in Canada specializes in the design and manufacture of windows and doors for the marine and surface transportation industries. Since 1934 the company, with its head office and manufacturing facility in Belleville, Ontario, and a sales office in Montreal, has been providing customers with quality products.

In addition to the popular aluminum-framed windows, the company has met the increasingly demanding specifications of more complex ships and rigs with the introduction of steel weld-in and brass bolt-on marine windows. Cast aluminum, brass, bronze, and steel weld-in portlights are also available.

Beclawat's Pyro-lite A60 and H-120 fire-rated windows for drill rigs are approved by the American Bureau of Shipping, Lloyd's Register of Shipping, and the Canadian Coast Guard. They can be made in any desired size up to a maximum of 78 by 39 inches.

The company's high-strength, light-weight bonded panels are suitable for ship and drill rig applications, including decking, accommodation partitions and doors, lockers, furniture, and wheelhouse control consoles.

For further information and free literature on Beclawat's extensive product range,

Circle 30 on Reader Service Card

Mobile Names IMS As Reseller Of Deepsea Lubricants

Mobil's U.S. Marine Division has named International Marine Sales, Inc. (IMS) as a reseller of marine deepsea lubricants effective mid-March. By utilizing the IMS sales force, Mobil will reach a broader marine market to expand its supply of Mobil's premium line of marine products in the U.S.

IMS, a worldwide supplier of marine fuels, is located in Stamford, New York, Miami and London.

Wartsila Unit Offers Vacuum Toilet System —Literature Available

The successful E-vac vacuum toilet systems, now found on more than 2,000 ships and offshore platforms, is manufactured by Wartsila Envirovac Systems of Helsinki, Finland. The company also produces the Orca II line of sewage treatment plants.

While E-vac systems have been adopted for every type of ship, particular attention has been drawn recently by the major orders received for installations in "superferries" and cruise liners.

Besides new buildings, including the biggest cruise liner ever ordered, these contracts also comprise a number of important retrofits. The special characteristics of vacuum plumbing technology—freedom from the need for natural fall, small piping, installation flexibility, and much-reduced sewage volume—are especially valued in rebuilding and conversion work.

For free literature on the E-vac system, that includes a useful guide to the impact of the latest pollution-control rules,

Circle 57 on Reader Service Card

Ship Structure Committee Releases New Reports On Design And Safety Topics

The Ship Structure Committee, an Interagency Advisory Committee dedicated to the improvement of marine structures, has recently published some new technical reports of interest to those concerned with the design and safety of ships and offshore structures. Among the new reports are the following:

SSC-317—"Determination of Strain Rates in Ship Hull Structures: A Feasibility Study"

This report presents a survey of existing data on shipboard stress/strain rates. The data bases are evaluated and strain rates from existing ship data are developed.

SSC-321—"Survey of Experience Using Reinforced Concrete in Floating Marine Structures"

This report reviews applications of marine concrete structures, research into concrete structures, and inspection and repair of these structures, and presents an extended bibliography on the subject.

SSC-323—"Updating Fillet Weld Strength Parameters for Commercial Shipbuilding"

This report presents a possible alternative method of assessing fillet weld requirements to the ABS weld tables.

SSC-326—"Long-Term Corrosion Fatigue of Welded Marine Steels"

This report represents a first look at corrosion fatigue by the Ship Structure Committee. It assesses those future directions that would be most fruitful for further study, approaching fatigue from both the deterministic and the probabilistic viewpoints.

SSC-327—"Investigation of Steels for Improved Weldability in Ship Construction"

This report is direct toward determining the weld procedure and metallurgical control necessary to develop adequate toughness in the weldment, using high-deposition rate weld procedures. This report is the third and final phase of the welding effort, and follows SSC-298 and SSC-305.

For copies of the reports or further information, contact Lt. Cdr. **Thomas H. Gilmour,** Secretary, Ship Structure Committee, U.S. Coast Guard (G-MTH-5), 2100 Second Street S.W., Washington, D.C. 20593.

BIRKA LINE CRUISE SHIP DELIVERED BY VALMET

Valmet Corporation's Helsinki Shipyard recently delivered its first passenger vessel, the Birka Princess, built for Birka Line Ab of Mariehamn, Finland. The new liner, which replaces the ferry Prinsessan that was built by Wartsila in 1966 and modernized in 1980, will operate unique 24-hour cruises from Stockholm to Mariehamn on the island of Aland, situated between the Baltic Sea and the Gulf of Bothnia.

Unlike the numerous passenger/car ferries operating in the Baltic, the Birka Princess is a true cruise liner. She has only a small car deck at the stern that will accommodate six motor coaches and 50 private cars, or 75 cars, with access via a side ramp.

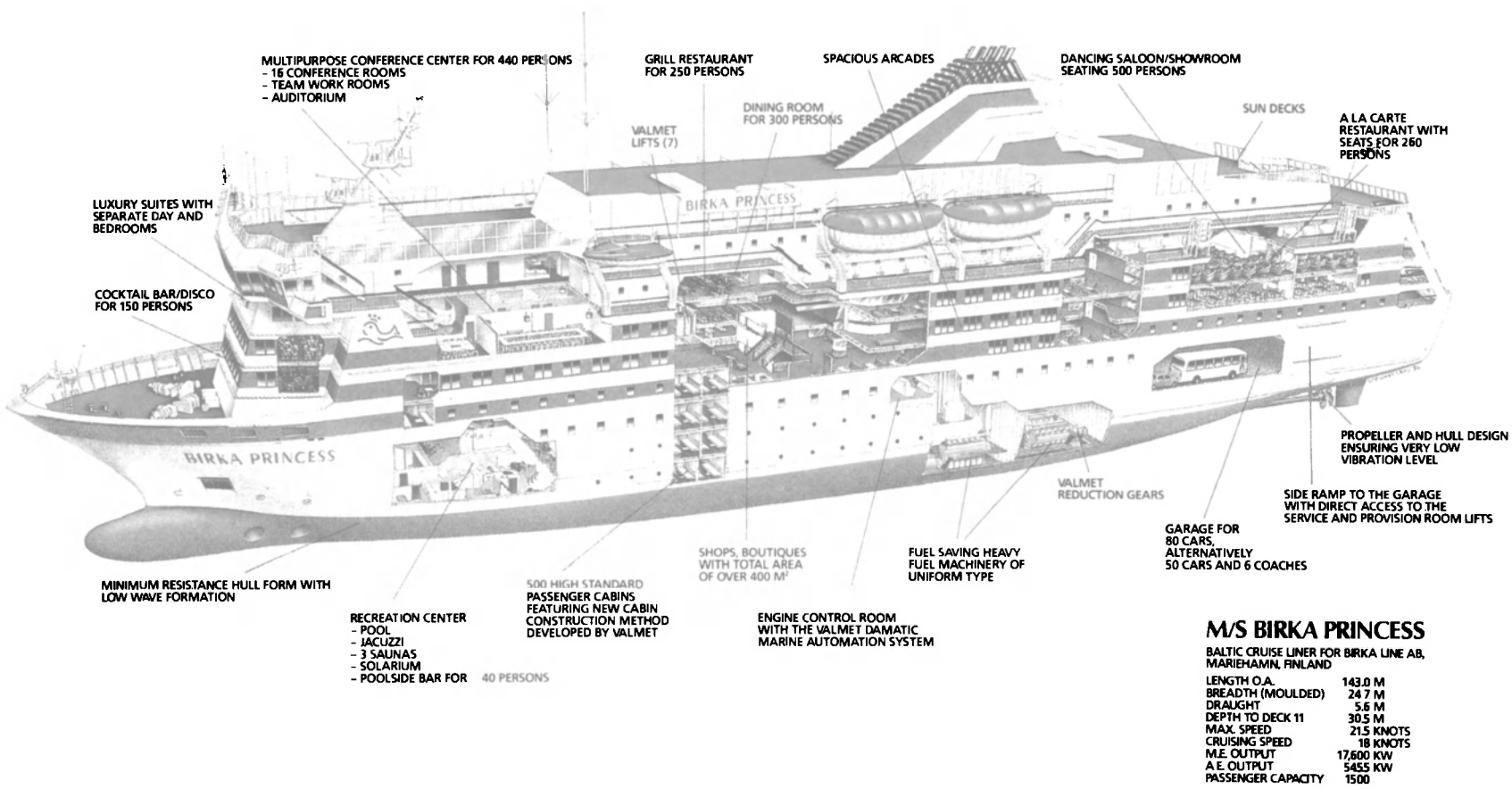
The new liner has an overall length of 469 feet, beam of 81 feet, depth to Deck 11 of 100 feet, and draft of 18.4 feet. Main propulsion is provided by four Wartsila-Vasa diesel engines with a total output of 23,600 bhp at 750 rpm, driving two KaMeWa controllable-pitch, highly skewed propellers via Valmet/Renk reduction gears. Cruising speed is 18 knots.

The accommodations, which provide for 1,500 passengers in 500 cabins, are of unusually high quality. This was achieved by skillful detail work, careful selection of materials, unique lighting systems, and other refinements. Passengers can view the impressive Stockholm archipelago and the Aland Sea through special panorama windows in the a-la-carte restaurant and dancing restaurant aft, as well as in the cocktail lounge and one of the large conference rooms forward.

The principal design considerations for the Birka Princess were economical operation, safety, easy maintenance, and a high level of automation. Machinery is controlled by Valmet's Damatic ship automation system. The company's other units are also well represented among the suppliers; the Tampere Works provided the six passenger and service elevators, and the reduction gears were supplied by the Rautpohja Works.

In cooperation with the Finnish company Rakennusvalmiste Oy, Valmet developed a totally new cabin construction method, with cabin wall elements completely fabricated at the factory. The units were fitted with all needed details, including furniture fastenings, plumbing, and electrical wiring. The partition wall between cabins is comprised of two

BIRKA PRINCESS
Built by: VALMET Helsinki Shipyard



M/S BIRKA PRINCESS

BALTIC CRUISE LINER FOR BIRKA LINE AB, MARIEHAMN, FINLAND

LENGTH O.A.	143.0 M
BREADTH (MOULDED)	24.7 M
DRAUGHT	5.6 M
DEPTH TO DECK 11	30.5 M
MAX. SPEED	21.5 KNOTS
CRUISING SPEED	18 KNOTS
M.E. OUTPUT	17,600 KW
A.E. OUTPUT	5455 KW
PASSENGER CAPACITY	1500

PVC-coated steel sheets backed by a 15-mm layer of mineral wool, with a 40-mm air gap between. This insures the best possible sound insulation between cabins.

The main navigation equipment in the spacious wheelhouse is concentrated in a cockpit type desk, making it possible for one man to control the navigation of the ship in a sitting position. The radar system is from Racal-Decca; it comprises one 10-cm ARPA radar that is interswitched with a 3-cm true motion unit.

The ARPA radar antenna is installed on the mast atop the wheelhouse, with the 3-cm antenna on the radar mast on the forecastle deck. In addition, there is a third independent 10-cm radar with a true motion display and an antenna atop the wheelhouse. Other navigation equipment includes a Raytheon DSN-450 dual-axis doppler speed log, a Simrad ED 61 echo sounder with a digital repeater, and an Anschutz Standard 4 gyrocompass.

The partially enclosed lifeboats supplied by Fiskars have a total capacity of 536 persons. The 62 davit-launchable life rafts supplied by Viking each have a capacity of 25 persons. All lifeboat and life raft davits are equipped with a remote control for the brake.

For additional information on Valmet's shipbuilding facilities and capabilities,

Circle 49 on Reader Service Card

BIRKA PRINCESS
Major Suppliers

Main engines (4)	Wartsila-Vasa
Reduction gears (2)	Valmet
Propellers (2)	KaMeWa
Machinery control system	Valmet
Steering gear	Tenfjord
Bow thruster	KaMeWa
Stern tubes	Centromor
Auxiliary diesels	Wartsila-Vasa
Generators	Kymi-Stromberg
Anchors	Hollandse Constructie
Chains	Ljusne Katting
Shaft seals	HDW
Sewage disposal plant	Deerberg
Vacuum toilets	Evac-Wartsila
Boilers, mooring winches	Rauma-Repola
Air conditioning system	Nordish Ventilator
Reefer plant for AC system	Stal Refrigeration
Air compressors	Hamworthy
Separators, heat exchangers	Alfa-Laval
Valves	Wouter Witzel
Centrifugal pumps	Maskinfabriken Iron
Oil pumps	IMO
Lube oil filters	Boll & Kirch
Couplings	Vulkan
Elevators	Valmet

Newport News Receives $12.5-Million Contract For USS Enterprise Work

Newport News Shipbuilding and Drydock Company, Newport News, Va., is being awarded a $12,521,311 cost-plus-fixed-fee contract for advance planning and preparation for the complex overhaul of the USS Enterprise (CVN-65). Work will be performed in Newport News, and is expected to be completed September 30, 1986. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-2078).

American Management Now Provides Services For Commercial Ships

For more than a decade, American Management System, Inc. (AMS), headquartered in Arlington, Va., has provided engineering, technical, logistics, and maintenance support services to the U.S. Navy. The company is now offering the full range of its services to commercial as well as military ship operators. This includes machinery diagnostics, machinery condition assessments, spare parts control, overhaul planning, computer applications, training, surveys, and inspections.

Central to its maintenance planning approach is AMS's diesel engine analysis service, an electronic engine tuning process for preventing expensive downtime, optimizing fuel efficiency, and decreasing maintenance and operating costs. Commercial and military ship operators can use this service for peak performance tuning and after engine overhauls to certify the quality of the work performed, resulting in substantial cost savings and improved vessel operations.

For additional information on the AMS diesel analysis process,

Circle 23 on Reader Service Card

FELS Awarded $25-Million Contract To Build Six Seagoing Hopper Barges

Far East Levingston Shipbuilding Ltd. (FELS) of Singapore has been awarded a $25-million contract for the construction of six seagoing hopper barges for Magnum International Trading (Pte.) Ltd. of India. Each barge will have an overall length of about 210 feet and deadweight of 1,950 tons.

The contract calls for the design, engineering, construction, outfit, and testing of the vessels before delivery to India. Further work will be done on the vessels in India before their final delivery to V/O Sudoimport of the USSR, the ultimate owner.

Norfolk Shipbuilding Gets $16.2-Million Contract For 'Iwo Jima' Overhaul

Norfolk Shipbuilding and Drydock Corporation, Norfolk, Va., is being awarded a $16,167,222 firm-fixed-price contract for the regular overhaul of the USS Iwo Jima (LPH-2). Work will be performed in Norfolk, and is expected to be completed February 16, 1987. Twenty-one bids were solicited and eight offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-H-8195).

Two More Firms Approve Use Of Ameroid® OWS —Literature Available

Drew Ameroid Marine has received two new approvals for the use of Ameroid® OWS quick separating degreaser. Ameroid OWS is a product that has exceptional cleaning properties, breaks quickly, and does not harm the operation of oily water separators or oil alarms required under the MARPOL regulation... addition, Ameroid OWS quick sep... rating degreaser reduces cleanin... time, is cost-effective, and is easy t... use.

The two new approvals come from the oily water separator manufacturers Sigma Systems of Chester Springs, Pa., and Facet of Tulsa, Okla. Besides these two companies, Ameroid OWS quick separating degreaser is recommended and/or approved by the following manufacturers of separators and bilge alarms: Biospherics, Inc.; Butterworth Systems (UK) Ltd.; Hamworthy Engineering Ltd.; Italgestra S.P.A.; National Fluid Separators, Inc.; Nelson Division, Nelson Industries; Separation and Recovery Systems, Inc.; Serep; and World Water Systems.

Ameroid OWS is normally available in 25 liter pails and 120 liter drums worldwide.

For additional information and free literature,

Circle 70 on Reader Service Card

Control Data Receives $81.2-Million Contract From NAVSEA

Control Data Corporation, Minneapolis, Minn., is being awarded an $81,226,432 firm-fixed-price contract for AN/UYH-3(V) magnetic disk memory recorder-reproducer systems. Work will be performed in Minneapolis, and is expected to be completed in January 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-5201).

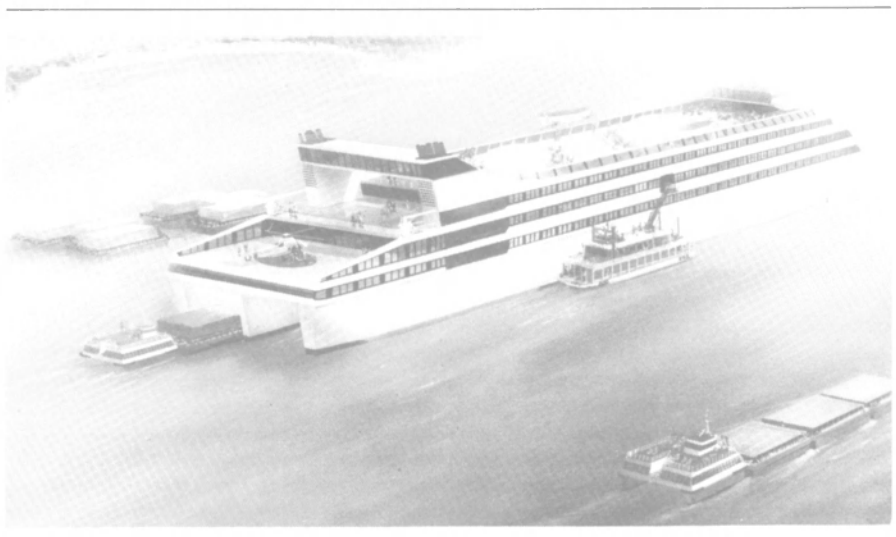
MarAd Invites Proposals To Provide Vessel For Schoolship Conversion

The Maritime Administration has invited proposals from interested parties to provide a vessel suitable for conversion to a U.S.-flag schoolship. It would replace the government-owned training ship Empire State, which is now operated by the State University of New York Maritime College of Fort Schuyler. That vessel was delivered in 1952 as a combination passenger-cargo ship.

MarAd offers two options in regard to the replacement ship's condition and place of delivery: (1) A vessel "suitable for conversion" to be delivered to the James River Reserve Fleet at Newport News, Va., or (2) a vessel "in a fully certificated and operational condition" delivered to Fort Schuyler.

The specification requires that the ship be suitable for transporting and berthing 800 persons, having its keel laid after December 31, 1960, and be between 450 and 600 feet in overall length. Offers to provide a suitable vessel must be received at MarAd by 10 am (EDT) July 16, 1986.

For additional information on this proposal, contact **Tim Roark** at MarAd, (202) 382-0353.



VALMET CORPORATION'S NEW BARGE-CARRYING CRUISE VESSEL DESIGN is shown in this artist's conception. The basic idea of the unique hybrid ship is to maintain regular cargo service in the Caribbean area as well as to carry cruise passengers. According to Valmet marketing director **Mikko Niini**, with the market for conventional cruise ships soon to be saturated, operators will have to look for new competitive solutions such as this combination carrier.

Port Authority Urges $56.5-Million In Funds For N.Y. Harbor Improvements

The Port Authority of New York and New Jersey, the State of New Jersey, and the City of New York have jointly urged Congress to appropriate $56,550,000 for five vital deepwater navigation projects in the Port during fiscal year 1987. All of the work would be carried out by U.S. Army Corps of Engineers. The proposed federal budget allots only $17,300,000 for four of the five projects.

The major portion of the $39,250,000 recommended increase for the bi-state port represents additional funding sought by local interests for the deepening of the Kill Van Kull and Newark Bay channels to provide an urgently needed initial depth of 40 feet in two years. The port interests are seeking $50 million for this project instead of the $12 million proposed in the federal budget.

The five projects, with their federal allotments and the recommendations of local interests, are:

Kill Van Kull and Newark Bay Channels—federal budget of $12 million, local interest recommendation of $50 million (construction);

New York Harbor Collection and Removal of Drift—federal $4.6 million, local interest $5 million (construction);

New York Harbor and Adjacent Channels—federal $200,000, local $600,000 (study);

Arthur Kill South to Fresh Kills—federal none, local $250,000 (study);

Arthur Kill Channel—federal $500,000, local $700,000 (study).

Marine Travelift Offers Full-Color Brochure On 250-Ton Mobile Boat Hoist

Sturgeon Bay, Wisc.-based Marine Travelift is offering a free full-color brochure on their 250-ton-capacity mobile boat hoist.

The 250-ton-capacity mobile boat hoist from Marine Travelift features quality construction and a single-operator station. Color photographs in the publication display these features as well as the hoist's hydraulic-powered individual hoisting drums, pivot trunnion, sling apparatus and direct chain-driven wheel assembly.

In addition to the color photographs, the publication contains two full pages of dimensional drawings showing the hoist from a front view, finger pier front view, side view and finger pier top view. A chart containing full specifications in both feet/inches and meters is included.

To receive a copy of this publication from Marine Travelift on their 250-ton-capacity mobile boat hoist,

Circle 72 on Reader Service Card

Bailey Controls Offers 18-Page Technical Paper On O_2/CO Boiler Control

Bailey Controls is offering a free technical paper presented by **E.P. Smith**, p. eng., market manager—energy group, on oxygen and carbon monoxide boiler control entitled, "Oxygen Control, Carbon Monoxide Control, or Both—Which is Best for Your Boiler?"

The 18-page publication, originally presented to the Institute of Power Engineers, 46th Annual National Conference in Nova Scotia, last year, is divided into several sections and is supplemented by the use of charts, graphs and line drawings.

Some of the topics covered in the paper include: "Oxygen Control, Carbon Monoxide Control, or Both—Which is best for Your Boiler?"; "Why Excess Air Trim Control in the First Place?"; "Oxygen as a Measurement of Excess Air"; and "Oxygen and Carbon Monoxide as an Index for Excess Air Trim."

For your free copy of this informative technical paper from Bailey Controls,

Circle 74 on Reader Service Card

William O'Malley Named Executive VP At Sonat

William C. O'Malley has been elected executive vice president of Sonat Inc., effective immediately. **Ronald L. Kuehn Jr.,** Sonat's chairman, president and chief executive officer, said Mr. **O'Malley** would have corporate-level responsibility for three of the company's oil services businesses, which include Sonat Offshore Drilling Inc., Sonat Marine Inc. and Sonat Subsea Services Inc. In his new position, he will relocate to Birmingham, Ala.

Mr. **O'Malley** has been president of Sonat Offshore Drilling, headquartered in Houston, since 1984. The same year, he was elected vice president of Sonat Inc. In 1985 he was elected a senior vice president of the parent company and chairman of Sonat Subsea Services and Sonat Marine.

He joined Sonat Offshore in 1982 as executive vice president. Prior to that, he was managing partner of the Washington, D.C., office of Arthur Young & Company. Mr. **O'Malley** earned a bachelor's degree in accounting and philosophy at the University of Scranton and completed the Harvard Graduate School Business Advanced Management Program.

Free Literature Available On Long-Life Marine Window Wipers For Ships

A new marine window wiper that will give longer life in the harsh conditions at sea, has been designed by Wynstruments Limited of Gloucester, England. The equipment simplifies ordering because the one model can be fitted above or below the window, with the motor on the left or right, and with varying lengths of wiper blades.

The Wynn Model "C" Straight-Line Wiper is easy to install and maintain, and has many design features to ensure trouble free operation. There is a quick release system for removal of the wipers for servicing, and the entire mechanism is accessible by the removal of a front cover secured by two fasteners.

The arm and blade assembly is rigidly supported by a carriage plate that features eight heavy-duty guide rollers which run on the inside surface of the aluminum wiper casing. Incorporated in the body of the wiper is a deicing system to keep the carriage plate and its rollers operating in the harshest of conditions. The heaters are of standard lengths and interconnected to fit any casing length.

A long carriage plate has been designed to give the wiper blade arm greater support and to provide rigidity to the wiper blades during operation. The eight rollers on the carriage plate lead to it being constrained and supported better. The diameter and materials of the rollers have been chosen to reduce skidding and seizing. Each roller is fitted with two tires of wear resistant material for good grip between the roller and the inside of the wiper case.

The reciprocating motion of the carriage plate and blade arm assembly is provided by a V-belt and crank shaft assembly. The V-belt runs around an electric motor driven drive pulley and an idler pulley which features a shock absorbing mechanism to extend the life of the drive belt.

The arm and blade assembly are fully adjustable, and blade arms up to 30-inch length have been tested successfully. The design can be configured to suit any size of ship window in maritime service today.

Component design and material choice is the culmination of many years' experience in the field and the continuing history of environmental testing by the company.

Designs are available for all sizes of vessels from small private motor or sailing yachts up to the largest tankers, cruise ships, or military vessels. The Wynn Type "C" window wiper can easily be retrofitted to any vessel.

Wynn marine window wipers are available in the U.S. through Marketec, Inc. of Chatham, N.J.

For further information and a free copy of a brochure titled "Type 'C' Straight-Line Bridge Window Wiper" from Wynstruments Limited,

Circle 66 on Reader Service Card

Jane's Publishing Offers Facsimile Edition Of First World's Fighting Ships

Jane's Publishing, Inc. has announced the publication of a special limited facsimile edition of **Fred T. Jane's** first reference book, the 1898 edition of All the World's Fighting Ships. The facsimile is as close to the original as the use of available modern materials permit.

Born in England in 1865, Mr. **Jane** was only 33 when he completed his work on the first edition. He was a capable artist, a prolific writer, and worked unceasingly to encourage interest and understanding of maritime affairs.

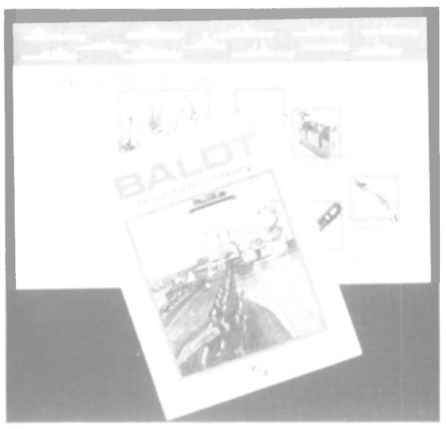
He not only compiled this work virtually single-handedly, but he also drew many of the illustrations and developed a unique classification method for ships' guns and armor, making comparison between different classes possible for the first time. In the original edition, the preface, explanation of the index, and notes to illustrations appear in French, German, and Italian as well as English.

"Jane's All the World's Fighting Ships 1898—Facsimile Edition," 218 pages 7½ by 12 inches, illustrated, $75. Jane's Publishing, Inc., 115 Fifth Avenue, New York, NY 10003.

$11.9-Million Contract To Rockwell For Submarine Gyros

Rockwell International Corporation, Autonetics Marine Systems Division, Anaheim, Calif., is being awarded an $11,955,000 modification to a previously awarded fixed-price-incentive contract for Electrically Suspended Gyro Navigators (ESGN) for various submarines. Work will be performed in Anaheim (90 percent), and El Paso, Texas (10 percent), and is expected to be completed November 30, 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-4366).

Baldt Offers Military Shipbuilding Brochure



Baldt Inc., Chester, Pa., has recently published a new four-color brochure on military shipbuilding. This brochure highlights Baldt products that have been manufactured to U.S. Navy specifications for more than 80 years.

Entitled, "Baldt—Proud to be on Board," this brochure includes comprehensive application information, product features and benefits, and product illustrations.

Baldt products that have been supplied to the U.S. Navy include: Stockless, Stato, Lightweight, and Balanced Fluke anchors; Hot Shot 500 wire rope socketer; carpenter stoppers; bridle assemblies; pelican hook chain stoppers; stud link welded chain; ball guide assemblies, and accessory hardware. A map highlighting Baldt's worldwide network of distributors is also included.

Baldt Inc. designs, engineers, manufactures and internationally markets a complete line of mooring system components for marine and offshore industry. With offices throughout the world, the firm provides extensive custom design and engineering services.

For your free copy of this full-color brochure from Baldt,

Circle 81 on Reader Service Card

Kollmorgen Receives $10.6-Million Contract For Periscope Sets

Kollmorgen Corporation, Electro-Optical Division, Northampton, Mass., is being awarded a $10,573,914 firm-fixed-price contract for type 18 B/D periscope sets and ancillaries for Sturgeon (SSN-637) and Los Angeles (SSN-688) class submarines. Work will be performed in Northampton, and is expected to be completed in February 1988. Two bids were solicited and two offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-4113).

York International Offers Brochure On Water Chilling And Condensing Units

York International (formerly Borg-Warner Air Conditioning, Inc.) has available a free brochure describing and picturing its Marinepak line of air conditioning chilled water coolers and condensing units for direct expansion applications. The bulletin also includes selection and layout data for ship stores refrigeration condensing units.

A York air conditioning or refrigeration Marinepak is a complete system, factory-assembled on a compact steel base. Interconnecting piping, controls, gauges, and power and control wiring are all installed at the factory. Wherever possible, standard York components are used, providing the user with a custom-made Marinepak without paying custom-made prices. More than 1,000 York Marinepaks have been installed on both merchant and naval vessels.

The Marinepak brochure contains full descriptions of all units, as well as mechanical specifications, performance ratings, physical data, photos and cutaway illustrations.

For a free copy of the York Marinepak brochure,

Circle 78 on Reader Service Card

Free 8-Page Brochure On Bardex Floating Drydock Transfer Systems

A new eight-page, full-color illustrated brochure is available from Bardex Corporation which explains the company's floating drydock-to-yard transfer systems in use with various shipyard layouts. The different types of floating drydock-seawall configurations are shown. Application photographs illustrate the text on Bardex roller beam transfer system, skid transfer system and wheeled transfer system.

For more information and a free copy of the illustrated brochure,

Circle 80 on Reader Service Card

Norsk Pacific Announces Management Changes— Stenstrom Named President

Mr. **Lawson** will be succeeded as president by **John M. Stenstrom**, who has been Norsk's vice president and operating manager since 1982. **W. Scott MacKinnon** has been appointed vice president and chief financial officer; he was formerly secretary/treasurer.

Capt. **Aage Y. Karlsen** moves up to general manager-Caribbean services, in the Walnut Creek headquarters, after having served as general manager in the Caracas, Venezuela, office as general manager of Naviera Pacifico C.A., a joint venture.

Several key management changes have been announced by Norsk Pacific Steamship Company Ltd. of Walnut Creek, Calif. **Robert P. Lawson** is stepping down as president on June 30 this year, retiring after a 38-year career. He served as president for 13 years, and prior to that held key management positions including assistant general traffic manager and manager-marine transportation for Norsk's then parent company, Crown Zellerbach Corporation.

Deepwater, Heavy-Duty Jackup Joins Blue Streak Marine Fleet

The Blue Streak Rabbit, a new self-elevating, self-propelled liftboat capable of serving offshore rigs in waters up to 100 feet deep, and lifting loads from its deck of up to 60 tons, has joined the Blue Streak Marine fleet. The vessel's deepwater capability and heavy-lift capacity can save contractors hundreds of thousands of dollars per job over other methods, according to **Dennis Good,** president of the Blue Streak companies that built and operate the boat.

The Rabbit is 101 feet 9 inches long, with a 69.5-foot beam and 9-foot depth. She is fitted with three 160-foot, 48-inch-diameter legs, permitting work in water up to 100 feet. Her 2,240-square-foot open deck can accommodate 200,000 pounds of deck cargo, and her 60-ton-capacity Blue Streak crane has a lattice boom of 110 feet; an additional 20 feet of boom is available. The vessel is also equipped with a 15-ton auxiliary crane.

The new liftboat, which cruises at 12 knots, is powered by two Detroit Diesel 16V92N diesel engines developing 1,274 total bhp. Ship's service and other electrical power is provided by two 75-kw generators driven by two Detroit Diesel 671N engines.

The air conditioned vessel has quarters, galley, and laundry accommodations for a crew of 32, and is equipped with a water desalinization unit and a sewage treatment system. Capacities include 5,000 gallons of fuel oil, 6,000 gallons of potable water, 1,000 gallons of hydraulic oil, and 150 gallons of lube oil. The vessel can jack itself up at a speed of nine feet per minute using a closed-loop hydraulic system.

American Bureau of Shipping Rules were used as guidelines in both design and construction by Blue Streak Industries, Inc., which built the boat and the crane at its Pearlington, Miss., shipyard. The boat's operator, sister company Blue Streak Marine of Belle Chasse, La., operates one of the world's largest fleets of liftboats.

Blue Streak has manufacturing licensing agreements with shipyards in Brazil and Singapore.

For more information on Blue Streak Marine,

Circle 37 on Reader Service Card

For more information on Blue Streak Industries,

Circle 38 on Reader Service Card

New Brochure Offered By Warren Describes Barge Pump Line

A new brochure was recently published by Warren Pumps Inc. of Warren, Mass., on their J-70 wet pit an dry pit screw-type barge pumps.

The free publication, which contains drawings of the model J-70 barge pump, offers a complete parts and standard material list, along with three selection tables. The tables are divided into viscosity SSU; pressure—psi; GPM; and bhp.

The Warren J-70 barge pump is a positive displacement screw pump featuring a four-screw design for excellent suction capability. A major feature of the design is its extremely low maintenance requirements. Special bearing construction provides wide liquid-handling capabilities. The pump fits standard barge dimensions, and its length can be tailored to a particular barge depth. The design handles both light oil and heavy oil barge requirements, pumping light hydrocarbons as well as viscous asphalts.

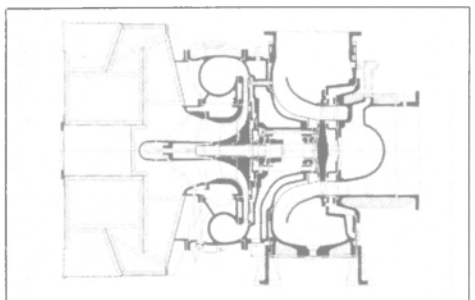
A Warren barge pump can be converted from wet pit to dry pit by the simple addition of an elbow. The pump's excellent suction-lift capability allows it to handle a wide variety of liquids through the suction headers on multi-compartmented barges.

For further information on the J-70 wet pit and dry pit screw-type barge pumps from Warren Pumps, and your free copy of this new brochure,

Circle 77 on Reader Service Card

PROPULSION UPDATE

M.A.N.-B&W Turbochargers Reduce Fuel Consumption —Literature Available



Cross-section of an NA exhaust gas turbocharger. This series covers the range up to a maximum engine output of 22,000 kw (29,920 hp) per turbocharger.

During the past year, the Polish engine manufacturer ZGODA tested an NA 34/T M.A.N.-B&W high-efficiency turbocharger on the test bed of a 6 ZL 40 engine. After successful tests, an identical engine from the four-engine plant of the ferry Pomerania was equipped with an NA 34T. Because of excellent results achieved during a 2,000-hour period of operation, the vessel's owner, Polish Baltic Shipping Company, decided to equip the other three engines with M.A.N.-B&W turbochargers.

Polish Baltic reports the following advantages with the new turbochargers:

- A reduction in the rate of fuel consumption by 4.5-6.0 grams per kilowatt hour, depending on engine load. For each engine this results in fuel savings of up to $7,000 per year.
- Following the installation of the improved turbocharging system, all engines may now be operated at full load without thermal overload. Consequently, the ferry can be operated at higher speeds during the busy season.
- Technical improvements allow one or two main engines to be shut down sooner than was previously possible when operating at lower speeds during the slow season.

For further information on M.A.N.-B&W turbochargers,

Circle 39 on Reader Service Card

For information on M.A.N.-B&W diesel engines,

Circle 40 on Reader Service Card

Rockwell International Offers Free Brochure On Cast Steel Valves

The Flow Control Division of Rockwell International has published a catalog entitled, "Rockwell Edward® Cast Steel Valves."

The product line includes Edward cast steel gate, globe, angle and check valves, Equiwedge® gate valves and Flite-Flow® globe and piston check valves.

The Rockwell Edward valves described in this catalog are widely specified for applications requiring high flow efficiencies, tight shut-off, dependable performance and long-term service life. Compatible with a great diversity of line fluids and flow conditions, these valves have a reputation for superior performance on high-temperature, high-pressure, high-velocity flow lines.

For a free copy of Catalog V-300-R3, "Rockwell Edward Cast Steel Valves,"

Circle 79 on Reader Service Card

SNAME Announces Standing, Special And Technical Committees For 1986

Capt. **Perry W. Nelson**, USN (Ret.), president of the Society of Naval Architects and Marine Engineers, a professional/technical organization for members of the marine industry, announced the following committee chairmen for 1986:

STANDING AND SPECIAL COMMITTEES

Advisory Public Service Committee—**Donald P. Courtsal**, vice president, acquisitions, Allegheny Financial Group, and vice president, Advisory Public Service for the Society.

Applications Committee—**William duBarry Thomas**, naval architect, J.J. Henry Co., Inc.

Audit Committee—**Lester Rosenblatt**, chairman of the board and chief executive officer, M. Rosenblatt & Son, Inc. and past president of the Society.

Awards Committee—Rear Adm. **Kenneth E. Wilson Jr.**, USN (Ret.), management consultant.

Banquet Committee—**Roderick B. Hulla**, project manager, J.J. Henry Co., Inc.

Budget and Endowments Committee—**Donald L. Caldera**, chairman and chief executive officer, Bahama Cruise Line, Inc.

Dinner Dance Committee—**Robert J. Bazzini**, national sales manager, Transamerica Delaval, Inc.

Education Committee—**William E. Zimmie**, consultant, Hyde Products, Inc.

Exposition Committee—**Robert G. Mende**, secretary and executive director of the Society.

Fellows Committee—Prof. **Richard B. Couch**, Department of Naval Architecture and Marine Engineering, the University of Michigan and honorary vice president of the Society.

Finance Committee—**Daniel D. Strohmeier**, past president of the Society.

Journal of Ship Production Committee—Prof. **Howard McR. Bunch**, NAVSEA professor, the University of Michigan.

Journal of Ship Research Committee—**Ralph D. Cooper**, director, marine board, National Academy of Sciences and honorary vice president of the Society.

Long Range Planning Committee—**Robert T. Young**, consultant and past president of the Society.

Marine Technology Committee—Dr. **William B. Morgan**, Head, Ship Performance Department, David W. Taylor NSRDC.

Member Insurance Committee—**Robert Axelrod**, vice president, finance, J.J. Henry Co., Inc. and treasurer of the Society.

Membership Committee—**Richard R. Hopkins**, president, JJH Inc. of Virginia.

Nominating Committee—**Donald E. Ridley**, senior vice president and general manager, marine division, Bird-Johnson Company and vice president of the Society.

Papers Committee—Capt. **Jack A. Obermeyer**, USN (Ret.), consultant and honorary vice president of the Society.

Pension Committee—**Douglas C. MacMillan**, consultant and honorary vice president of the Society.

Principles of Naval Architecture Control Committee—**John J. Nachtsheim**, consulting naval architect and past president of the Society.

Publications Committee—**Roy L. Harrington**, manager, modular construction, Newport News Shipbuilding and vice president of the Society.

Scholarships Committee—Capt. **Robert E. Stark**, USN (Ret.), consultant and honorary vice president of the Society.

Sections Committee—**Donald E. Ridley**, senior vice president and general manager, marine division, Bird-Johnson Company and vice president of the Society.

Technical and Research Advance Planning Committee—**Naresh M.**

Maniar, vice president, M. Rosenblatt & Son, Inc.

Technical and Research Finance and Administration Committee—**David H. Klinges,** vice president, marine construction, Bethlehem Steel Corp.

Technical and Research Steering Committee—**Ronald K. Kiss**, Director for Shipbuilding, Office of Assistant Secretary of the Navy (Shipbuilding and Logistics), Navy Department.

TECHNICAL COMMITTEES

Hull Structure Committee—Dr. **Walter M. Maclean**, acting director, National Maritime Research Center.

Hydrodynamics Committee—**Frank H. Sellars**, engineer, MPR Associates.

Marine Systems Committee—**Edward M. MacCutcheon**, consulting engineer.

Ship Design Committee—**Donald P. Roseman**, chief naval architect, Tracor Hydronautics, Inc.

Ship Production Committee—**Jesse W. Brasher**, director, productivity and operational evaluation, Ingalls Shipbuilding.

Ship Technical Operations Committee—**Thomas J. Sartor Jr.**, vice president, chartering, Farrell Lines, Inc.

Ships' Machinery Committee—**Thomas P. Mackey**, president and general manager, Hyde Products, Inc.

Small Craft Committee—Capt. **Richards T. Miller**, USN (Ret.), naval architect and marine engineer and honorary vice president of the Society.

Free 72-Page Catalog Describes New Falk Worm Gear Speed Reducers

A comprehensive 72-page catalog now available from The Falk Corporation of Milwaukee, Wis., provides complete details on the firm's new line of OMNIBOX® worm gear speed reducers. The modular-design units are reported to offer a selection of at least 275,000 different combinations.

Catalog 271-108 provides specifications, pertinent application data, selection tables, and ordering information. Service factors are listed both by application and by industry. Among the many available configurations are: hollow shaft, coupling, or motorized C-flange input connections, worm over, worm under, vertical output, vertical input, flanged output, single and double reduction worm/worm and helical/worm types. All are conveniently referenced in the brochure. Cross-sectional views provide an "inside look" at design and construction.

According to Falk, the catalog's selection guide and tables are specially designed to simplify locating the right OMNIBOX reducer for any given application.

Circle 235 on Reader Service Card →

The Falk Corporation, Milwaukee-based subsidiary of Sundtrand Corporation, is a major manufacturer of industrial power machinery, including gear drives, couplings and fluid power drives.

For a free copy of the 72-page Catalog 271-108 on Falk OMNIBOX worm gear speed reducers,

Circle 8 on Reader Service Card

Sparton Receives $5.1-Million Modification To Sonobuoy Order

Sparton Corporation, Sparton Electronics Division, Jackson, Mich., is being awarded a $5,118,279 firm-fixed-price modification to design, qualify and furnish 2,100 AN/SSQ-53D sonobuoys with LAU-126/A launcher contianers and associated data. Work will be performed in DeLeon Springs, Fla., and is expected to be completed in July 1988. Three bids were solicited and three offers were received. The Naval Avionics Center, Indianapolis, Ind., is the contracting activity (N00163-86-C-0007).

Free Full-Color Bulletin On AQP Spiral Wire Hose Offered By Aeroquip

Aeroquip's three AQP® spiral wire hose styles are featured in the company's new U.S. Industrial Group Bulletin 2064 entitled, "Tough Hose for the Toughest Jobs."

Particularly suited for use on heavy equipment in construction, mining, logging, transportation and in-plant conditions, Aeroquip AQP spiral hose styles include: *FC323 hose* featuring standard crimped fittings for sizes −12 through −24 and internal skive/wire trap crimped fittings for all sizes. Maximum operating pressure of 3,000 psi in all sizes; *FC324 hose* with reusable fittings for −08 size and standard crimped fittings for −12 and −16 sizes. Maximum operating pressure of 4,000 psi in all sizes; and *FC325 hose* available with internal Skive/wire trap crimped fittings for all sizes. Maximum operating pressure of 5,000 psi in all sizes.

Featuring a four-spiral wire reinforcement, Aeroquip patented AQP elastomer tube and an abrasion resistant blue cover, Aeroquip AQP spiral wire hose has a −40°F to 300°F temperature range. The firm's AQP spiral hose is compatible with phosphate ester base and petroleum base hydraulic fluids, plus hundreds of other fluids, including acids and solvents.

During laboratory testing, Aeroquip AQP spiral wire hose lasted six times longer than SAE 100R12 spiral hose in side-by-side abrasion testing, according to the company. And when tested under demanding impulse conditions, it lasted twice as long as the SAE 100R12 test specification.

The Aeroquip bulletin contains complete information on the company's spiral wire hose styles, as well as configuration charts and assembly equipment. For your free copy of the bulletin,

Circle 98 on Reader Service Card

$3.5-Million Navy Contract To Sargent Industries From Ships Parts Center

Sargent Industries Incorporated, Huntington Park Division, Huntington Park, Calif., is being issued a $3,500,000 delivery order for 76 line items in support of the overhaul of second flight SSN-688 class submarines. Work will be performed in Huntington Park, and is expected to be completed March 28, 1988. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-85-G-A033).

PRMMI Names Four To Key Sales Positions

Gerald P. Toomey, president of Puerto Rico Marine Management Inc. (PRMMI) of Edison, N.J., a privately owned management company that serves as agent for Navieras de Puerto Rico, has announced four key sales appointments.

J.D. Plemmons has been named manager for the Carolinas, which includes responsibility for the Charleston and Charlotte offices. Prior to joining PRMMI he was with Pilot Freight Carriers in traffic and sales, Johnson Motor Lines in traffic, Sea-Land as sales manager and terminal manager, and United States Lines as sales manager and operations manager.

Wayne E. Harrington has been appointed New England regional sales manager. He was previously Northeast regional sales manager for Barber Steamship Lines, assistant vice president of Siemers Steamship Agency, Inc., and sales manager for Peabody & Lane, all of Boston, and sales representative for Sea-Land Service in Baltimore.

John B. Chester has been named sales representative in the Charlotte office. He previously served as vice president of Caribbean Freight Service in Charlotte, and as manager of Johnson Shipping Agency in Miami.

G. Gregory Pagan is now sales representative in the New Orleans office. He served as operations supervisor with PRMMI prior to this appointment. Before that he was production manager and art director for the Baton Rouge *Business Report.*

MHI Develops High-Pressure Gas Injection DFD Engine —Literature Available

Mitsubishi Heavy Industries, Ltd. (MHI) recently developed a high-pressure gas injection dual fuel diesel (DFD) engine, a next generation engine for liquefied natural gas (LNG) carriers.

The new engine uses Boil-off Gas (BOG) generated while transporting LNG as fuel to sharply cut down on fuel cost. It employs a high-pressure gas injection system that injects 250kg/cm² gas into cylinders at the end of the compression process, achieving a high compression ratio unattainable by conventional DFD engines using low-pressure gas. The high compression ratio allows operation at low cost and high output comparable to fuel oil burning engines.

The new DFD engine features an MHI-designed electronic governor for fine-tuned control of the engine in accordance with changes in BOG generation in the LNG tanks and varying navigational conditions. It also has systems to monitor fuel burning in cylinders, the operation of fuel injection valves, and temperatures and pressure of major parts for automatic troubleshooting in tandem with the electronic governor. MHI has already confirmed the new engine's controllability, safety and performance through tests at its Nagasaki Technical Institute.

At a demonstration held at the Kobe Shipyard & Engine Works recently, the company used the 7RTA84M modified for gas/fuel oil dual burning only in the seventh cylinder. The 7RTA84M is the same type as the 7RTA84MDF planned for installation as the main engine on an LNG carrier to be assigned for the Australian North West Shelf LNG Project.

For complete literature containing further information,

Circle 54 on Reader Service Card

Free Four-Page Brochure Offered On Acorn Platens

Acorn Iron & Supply Co., Philadelphia, Pa., has made available a free four-page brochure titled "Platenize Your Plant With Acorn Platens." Acorn platens are described as semi-steel castings from 9 to 40 square feet, depending on size (multiples available). The top surface and side ledges are machined to within .005-inch degree of flatness and each platen has 1¾-inch square holes, spaced 3½ inches, center to center. These holes are used for clamping, dogging or spacing.

The brochure points out that used singly or in multiple groupings, Acorn platens are standard equipment in many missile, electronic, robotics, aircraft plants, shipyards, railroads, pipe and steel fabricators, research laboratories, and wherever metal is formed, shaped or welded.

The publication contains drawings of a typical four-platen installation, including Acorn stands. The stands are made from sturdy structural steel members. They elevate the tops of platens to standard 30-inch height or other specified height (multiples available).

Tools and accessories illustrated include the tapered drift pin (10 inches long); gooseneck hold-down dog (hand-forged steel, 15-inch throat); special hold-down bolt and nut (with special forged head and washer); Acorn burning pyramid; bending post; platen vise; 45° and 90° horizontal clamp (with hardened screw, swivel cap and sliding handle); and arm clamp (with clamping screw, swivel cap, sliding handle, complete with special hold-down bolt, nut and washer).

An extensive list of industries, schools, etc., where Acorn platens are in use is given on the final page and includes such varied names as Cities of New York, Miami and Cincinnati, Bethlehem Steel Co., University of California, and G. Schmidt Brewery of Philadelphia.

For a free copy of the brochure and further information on Acorn platens and tools,

Circle 83 on Reader Service Card

$3.4-Million Contract To Bertucci Construction For Southwest Pass Work

Anthony J. Bertucci Construction Company, Incorporated, Jefferson, La., is being awarded a $3,414,293 firm-fixed-price contract for the construction of the Southwest Pass for a shore dike, and the placement of 37,200 tons of filter stone, 162,900 tons of armor stone and 79,300 cubic yards of shell. Work will be performed at the Southwest Pass of the Mississippi River, and is expected to be completed by December, 1986. The amount of this action is $2,300,000, with the balance to be incrementally funded at a later date. There were 15 bids solicited on March 20, 1986, and two bids received. The contracting activity is the New Orleans Engineer District, New Orleans, La. (DACW29-86-C-0073).

The Sterling was converted by Aluminum Boats, Inc., of Louisiana.

'New' High-Speed Ferry Boosts Boston Area Commuter Service

The number of high-speed, round trips available to ferry commuters in South Boston suburbs increased by 40 percent recently with the addition of a 100-foot, 150-passenger ferry boat to the Boston Harbor Commuter Service fleet.

The "new" boat, the Sterling, is actually a converted 30-MPH all-aluminum crewboat built in 1980 for the rapid transport of personnel and cargo to offshore rigs in the Gulf of Mexico. Aluminum Boats, Inc., successor the vessel's builder, Camcraft, Inc., performed the conversion at its shipyard in Crown Point, La., a New Orleans suburb.

Dana Goodell, president of Boston Harbor Commuter Service, said the Sterling can make the 9.8-mile run from its berth at the old Hingham Shipyard to Rowes Wharf in downtown Boston in just under 30 minutes. He added that some older, slower vessels now take between 45 and 60 minutes to make the same trip.

"We chose to convert a crewboat rather than build a new ferry because the economics are perfect," said Mr. **Goodell.** "Right now there are many excellent, hardly used crewboats available at low prices because of decreased offshore oil and gas activity. Crewboats are designed and built tougher than ferries because they operate in open seas and have to withstand pounding against rigs while loading and unloading people and cargoes in rough seas. They are faster because they have to cover greater distances than ferries and the rig crews they carry are paid full wages during transit. They can work year round and have no problems with the high winds and ice in the Boston harbor."

The main cabin of the rebuilt boat, which can seat 80, features rows of two seats each separated by wide aisles, much like those on jumbo jets. All inside seats are cushioned, and are 2 inches wider than regular seats for additional comfort. This level also features a small galley which serves coffee and doughnuts in the morning and cocktails in the afternoon.

Below the main deck is another level with similar seating for 39 along with a lounge and tables for those who wish to play cards or work. The outer, upper deck is certified for 100 commuters or whale watchers as the boat is available for private parties and charter. Inside seats are easily removed to provide additional space for a band and dance floor for receptions.

"It's easy for passengers to work, play cards, and eat and drink on this boat," said Mr. **Goodell,** "because of all the ferry boats I know, this one gives the smoothest ride and the most stability under way. It's also the quietest because its new underwater exhaust system greatly reduces the noise level inside the boat."

The transition from crewboat to ferry boat required a 47-foot extension of the main cabin over the aft deck; removal of the captain's stateroom, crew quarters (except two bunks and shower), and galley in the lower compartment; installation of new flooring, ceiling, bulkheads and paneling; installation of lounge seats and coffee tables; removal of the air cooling system and bolstering of the heating system; installation of thermal windows; and conversion to an underwater exhaust system.

In a refreshing return to the uncomplicated business practices of the past, all of the $200,000-plus modification work was accomplished by a handshake of the two principals, Mr. **Goodell,** and **Salvador Guarino,** president of Aluminum Boats, Inc.

"They (Aluminum Boats, Inc.) converted another crewboat, the Chimera, for us in early 1984," said Mr. **Goodell.** "We put them on really tight deadlines, like 90 days from start to finish, and both boats were ready on the requested delivery dates. If **Sal (Guarino)** says something will be done, you can bank on it, and his workmanship is 100 percent."

The Sterling was originally the Sterling Fryou, which was built in 1980 for Briley Marine Service of Morgan City, La. She served that company for 15 months in the Gulf of Mexico. The ferry is 100 feet in length, with a 24-foot beam, and 5-foot draft. She is powered by two Detroit Diesel 12V71TI diesel en-

gines developing 510 HP each at 2,100 rpm. Power for the ship's electrical and other systems is generated by two 40-kw Detroit Diesel 371 engines with Delco generators. All of the vessel's communications and navigation equipment was retained including its two radars and aft control station.

The Boston Harbor Commuter Service operates under the aegis of the Massachusetts State Water Transportation System and the Mass. Bay Transit Authority. The fleet now totals four ferries, increasing the number of daily round trips from 10 to 14. The company serves about 1,200 commuters daily and approximately 1,600 during peak summer periods. A one-way trip is $3 which includes all-day parking at the ferry landing at Hingham. Daily parking rates in Boston range from $3 to $15.

The ferries also serve as feeders to the shuttle ferry serving Boston's Logan Airport.

For further information on services and facilities offered by Aluminum Boats,

Circle 31 on Reader Service Card

Midland River Ohio Co. Moves Its First Tenn-Tom Waterway Tow

Midland/Ohio River Company (ORCO), one of the nation's largest river transportation companies, moved its first tow on the Tennessee-Tombigbee Waterway recently. ORCO and R&W Marine, a Midland subsidiary, carried nearly 6,000 tons of Kentucky coal in four barges for Weyerhaeuser.

After the 10-day, 900-mile trip to the Port of Columbus, Miss., the coal was transferred to trucks for the final leg to the Weyerhaeuser mill, where the coal was burned with wood to produce electricity and steam.

Weyerhaeuser plans to study the cost of the operation to see if it will continue to use the Tenn-Tom to bring in coal.

For full details on Midland/Ohio River Company services on the Tennessee Tombigbee Waterway,

Circle 85 on Reader Service Card

Microphor Offers New Four-Color Brochure On Marine Heads

Microphor, Inc. of Willits, Calif., has just published a new four-color brochure on its Microflush Marine Heads. The high-quality brochure details the broad marine applications of the Microflush, which uses only one-half gallon of water per flush.

The cover title of the brochure is "Distinctive Design and Proven Performance." This refers to Microflush marine heads having been specified and installed on yachts, tugs, workboats, barges, and pleasure craft for more than 15 years, and the recent conversion of all china models to a high-style design available in colors.

The Microflush is a single-piece, low-profile, designer-styled vitreous china toilet available in three stock colors and 20 custom colors. It is available in round or elongated bowls, with either rear or downward discharge. It has an extremely quiet, 12-second flush cylce, and is available with oak and brass appointments. Stainless steel models are available where vandalism is a major concern. All of the fixtures are solid brass with triple chrome plating, and are designed to reduce water consumption.

Microphor also manufactures MSDs, oily water separators and monitors, sump pumps, and chlorine tablets for the marine market. A Harrow company, Microphor manufactures products for the marine, railroad, plumbing, and custom manufacturing industries.

For a free copy of the new Microflush brochure,

Circle 65 on Reader Service Card

Circle 177 on Reader Service Card →

New Products Protect/Restore Expensive Equipment— Literature Available

ITW Philadelphia Resins Corporation of Montgomeryville, Pa., is offering a brochure on a new family of space age products that provide long-term protection for new or reconditioned equipment, with excellent resistance to abrasion, impact, cavitation, corrosion, erosion and chemical attack. Typical industrial/marine applications are illustrated in the publication.

No heat, pressure or special tools are needed to create an integral bond between the titanium-based, machinable repair compound (or the severe-service ceramic liquid or putty) and new or worn equipment. The company reports abrasion resistance, per ASTM D406, is five times better than competitive products.

For further information and a free copy of the brochure from ITW Philadelphia Resins,

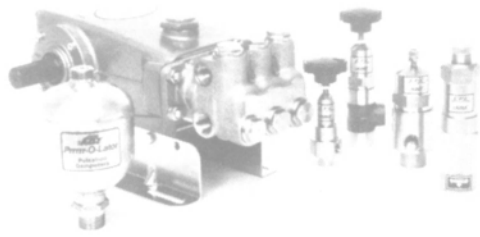
Circle 14 on Reader Service Card

Detroit/Windsor Form International Port Corporation

The Detroit/Wayne County Port Authority and the Windsor (Ontario) Harbour Commission have entered into an agreement to create a new international port corporation, the Detroit/Windsor Port Corporation (DEWIN).

The action marks the first time in North America that a U.S. and Canadian port have combined their resources, thus increasing the volume and diversification of cargo movements through their port areas. The two cities are directly across the Detroit River from each other, 869 nautical miles from the entrance to the St. Lawrence River.

Cat Pumps Introduces Two New Stainless Steel Pumps —Literature Available



Shown are a Cat stainless steel pulsation dampener, a stainless steel plunger pump and various CPC pressure regulators.

Cat Pump Corporation of Minneapolis has announced the introduction of two new stainless steel plunger pumps, the Model 651 rated 7 gpm at 3,000 psi, and the Model 1051 rated 10 gpm at 2,200 psi. Both models feature all 316 stainless steel wet-end construction including manifold head, valve plugs, valves and seats, seal cases, male and female adapters, and plunger retainers for corrosion resistance, chemical compatability, and 180 F operating capabilities.

The drive end of these pumps is constructed of a forged, nitrated chrome-moly crankshaft, stainless steel plunger rods with zamak crossheads, zamak connecting rods, and heavy-duty, tapered roller bearings—the same high construction standard in all Cat pumps to provide hours of continuous duty and maximum return on investment.

These lightweight, compact pumps are said to be easy to install, energy efficient, and need only simple tools to do on-site periodic maintenance.

For further information and free literature on these new pumps,

Circle 21 on Reader Service Card

Polarmarine Introduces New Concept In Tank Cleaning —Literature Available

Polarmarine Ltd. of London has developed an entirely new concept in tank cleaning with the unique feature of two, three or more nozzles at different levels within the tank driven by a single control unit.

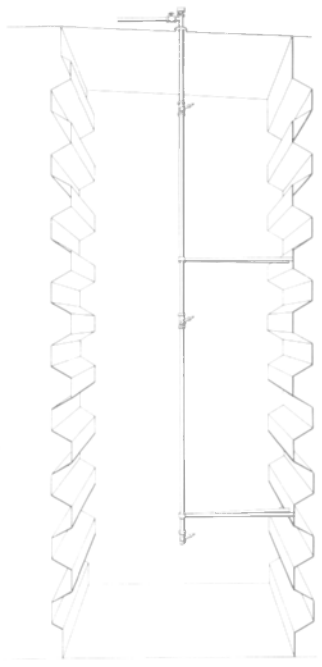
Free literature is now available fully describing the new system.

This new invention from Polarmarine is a product designed to meet today's stringent requirements of cleaning in (a) chemical carriers, especially with narrow tanks with "shadow" creating steel structure such as horizontal corrugations, stringers or longitudinals; and (b) oil tankers, especially in stringer areas of wingtanks or sloptanks.

With the new Polar Jet PJ 603 series, one unit can replace up to three deck-mounted standard units in chemical carriers or replace a standard deck-mounted one and submerged machines in oil tankers. This not only reduces high installation costs but also, by the PJ 603 programming possibilities, considerably reduces operating costs.

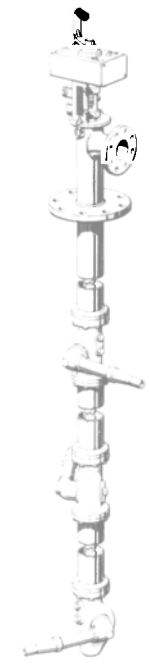
Polar Jet PJ 603 series can be delivered with either Polar Jet portable air-driven lightweight control units A-model or integrated turbine driven control units T-models, both of Polar Jet well-known and proven designs easy to understand and program, and with exceptional reliability.

Below deck the new machine is based on the standard Polar Jet design but instead of one nozzle rotating on the main pipe, this new model can be delivered with two, three or more nozzles at different tailormade levels.



Sketch showing the new cleaning concept.

The unit is self-draining and also self-cleaning.



Drawing of a PJ 603 A model.

For free literature containing full details,

Circle 41 on Reader Service Card

Daewoo Awarded Contract To Build Big Car Carrier For Leif Hoegh Of Norway

Leif Hoegh & Company of Oslo has announced the signing of an agreement with Daewoo Shipbuilding and Heavy Machinery Ltd. of Korea for construction of a ship with a capacity of about 5,700 cars. The new carrier will be operated by the joint venture Hoegh Ugland Auto Liners (HUAL). It will be owned by a Panamanian company and chartered to Hoegh for 12 years, with an option to purchase any time during the charter period.

One of the leading car-carrying operations outside of Japan, HUAL operates a fleet of 13 ships. It recently won a 2½-year contract valued at up to $200 million to transport export cars from Japan for Nissan.

New Shipowning Firm Established In Norway

Norwegian shipowner **Johan N. Gerrard** of Kristiansand has founded a new shipowning company, Gerrard Shipping Company A/S, and purchased the 125,000-dwt specialized tanker Gerina from his existing company. At the same time, he established an operating company for the ship, Gerrard Management Company A/S. Purchase of the Gerina was financed by Den norske Creditbank.

The ship was delivered by the Swedish Uddevallavarvet yard in 1980, and was retrofitted for buoy loading of oil in 1985. The vessel is currently under charter to Statoil, the state-owned Norwegian oil company, transporting oil from the Statfjord Field in the North Sea.

Tampa Shipyards Delivers Fifth Products Tanker To Ocean Shipholdings

The 30,000-dwt motor vessel Lawrence H. Gianella, fifth of five sophisticated T-5 product carriers designed and constructed by Tampa Shipyards Inc. in Florida, was delivered recently to Ocean Shipholdings, Inc. of Houston. The new ship is now being operated by the owner's subsidiary, Ocean Product Tankers, Inc., under charter to the Navy's Military Sealift Command.

The tanker has an overall length of 615 feet, beam of 90 feet, depth of 53 feet 8 inches, and design draft of 34 feet. She is powered by a low-speed IHI/Sulzer 5RTA76 fuel-efficient diesel engine with a maximum continuous rating of 18,400 bhp at 98 rpm. The engine, derated to prolong its service life, drives a shaft generator through a speed-increasing gearbox to provide electrical power while at sea. The combination of these two characteristics provides the operator with excellent fuel economy.

The propulsion plant is designed for unmanned operation, and is classed +AMS ACCU by the American Bureau of Shipping. The engine is direct drive via a solid shaft to a fixed-blade, nickel-aluminum-bronze propeller manufactured by Ferguson. Speed at 75 percent of mcr (15,300 bhp) is 16 knots.

The Gianella is designed to deliver 30,000 long tons of petroleum products worldwide, and is ice-strengthened to ABS Ice Class 1C for Arctic and Antarctic operations. Cargo is carried in seven pairs of tanks, each pair being segregated from any other pair to allow seven different liquid cargoes to be carried. Each tank is fitted with a stainless steel, high-pressure hydraulic cargo pump supplied by Framo. The pumps are sized to discharge the entire cargo within 16 hours, and in service have achieved this easily.

All cargo tanks are fully inerted by a Holec inert gas generating system designed to supply two pairs of tanks through dedicated systems to guard against cargo contamination; the remaining five pairs are served by a common system. Cargo piping and inert gas piping are constructed entirely of stainless steel. Facilities for underway replenishment at sea are provided from two stations; refueling at sea capability over the stern is also incorporated.

The unique construction of the cargo tanks developed by Tampa Shipyards has substantially reduced surface area compared with conventional construction. This results in significant cost reduction in epoxy coating maintenance inside the cargo tanks.

Water ballast is carried in double bottom and wing tanks, completely segregated from the cargo, and is arranged to qualify for "Protectively Located Segregated Ballast" under IMO regulations.

The entire hull, except foundations and superstructure, is constructed of AH36 high-strength steel, realizing a 15-percent saving in total steel weight over Grade A steel, and is designed for a scantling draft of 36 feet.

Extensive vibration analyses were confirmed by instrumenting the ship during sea trials and conducting a comprehensive vibration survey. Noise predictions were also made and confirmed to be acceptable by survey during sea trials. This survey, combined with the favorable vibration characteristics, results in a comfortable living atmosphere for the crew.

For further information on Tampa Shipyards,

Circle 50 on Reader Service Card

LAWRENCE H. GIANELLA
Major Suppliers

Main engine	IHI/Sulzer
Propeller	Ferguson
Diesel generators (3)	Caterpillar/Kato
Shaft generator	Nishishiba
Emergency generator	Detroit Diesel
Waste heat boiler	Kentube
Air compressors (2)	Hamworthy
Waste heat distiller	Alfa-Laval
Steering gear	Hastie
Sewage treatment plant	FAST
Foam system	National Foam
Cargo tank washing system	Dasic
Cargo tank remote level gauge system	Saab
FW cooling, SW cooling, lube oil, ballast and cargo pumps	Framo
Fuel oil purifiers (3)	Alfa-Laval
Main switchboard	Westinghouse
Inert gas generators	Holec

PROPULSION UPDATE

Caterpillar 3600 Series Now Qualified On 1,500 Redwood Fuel

Caterpillar Engine Division's newest family of diesel engines, the 3600 Series, is now in production at the company's new plant in Lafayette, Ind. North American field operations for the 3600 began in August 1984. A 3606 marine engine powering a bulk carrier now has more than 8,500 hours service at 2,250 bhp; a 3608 prime power generator set has accumulated 5,700 hours at 2,000 kw, 60Hz; and a 3612 marine engine in a Great Lakes freighter has run 2,750 hours at 4,500 bhp. In addition, single-cylinder test engines have operated 35,000 hours, including engine development work on spark-ignited and residual-fuel configurations.

The 3600 Series has now been qualified on 1,500 Sec. Redwood No. 1 fuel at contaminant levels of up to 3½ percent sulfur and 300 ppm vanadium. Development work is continuing on heavier fuels. Production of the 3600 Series began with four generator sets shipped during the latter part of 1985. A 3612 locomotive engine was installed by the end of December, followed by a 3616 prime power generator set, a 3606 engine for dredge power, and three 3608 marine engines.

The four-stroke-cycle, turbocharged and aftercooled engines have a bore of 280 mm and stroke of 300 mm (11 by 11.8 inches), with in-line 6- and 8-cylinder and V-12 and V-16 arrangements in a power range of 2,000 to 6,000 bhp.

Caterpillar expects the 3600 Series engines to be among the most fuel-efficient and durable in their power and speed class, 720 to 1,000 rpm. Initial rated fuel consumption of 0.327 pounds per horsepower-hour was achieved through system and component efficiency, including turbocharger match, unit injectors, precision injection timing, and high combustion pressure capability. The family is designed to operate on a range of blended fuels.

Serviceability of the 3600 family has been insured with engine-mounted oil and fuel filters, segmented crank camshafts, and development of exchange cylinder repair kits and hydraulic servicing tools.

The 3600 Series is said to be the only totally new medium-speed diesel in the 3,000-6,000 bhp class engineered and manufactured in North America in more than two decades. Caterpillar becomes one of a limited number of diesel engine manufacturers offering worldwide distribution and parts and service support for diesels in the 70-6,000 bhp range.

For additional information and free literature on the Caterpillar 3600 Series engines,

Circle 43 on Reader Service Card

CATERPILLAR ENGINES (FAMILY/MODEL/SERIES/SPECIFICATIONS)

Family	Model/ Series	Output Range kW	(HP)	Displacement L (cu in)	Bore x Stroke mm	(in)	Configuration	Peak Torque N.m	(lb ft)	Model/ Series
1.1 Liter	3114	52 - 116	(70 - 155)	4.4 (266)	105 x 127	(4.1 x 5.0)	1-4	241 - 532	(177 - 391)	3114
	3116	116 - 172	(155 - 230)	6.6 (403)	105 x 127	(4.1 x 5.0)	1-6	532 - 790	(391 - 581)	3116
3200	3208	93 - 187	(125 - 250)	10.4 (636)	114 x 127	(4.5 x 5.0)	V8	542 (400)	to 868 (640)	3208
3300	3304B	64 - 123	(85 - 165)	7.0 (425)	121 x 152	(4.8 x 6.0)	1-4	388 (286)	to 675 (498)	3304B
	3306B	93 - 210	(125 - 270)	10.5 (636)	121 x 152	(4.8 x 6.0)	1-6	588 (433)	to 1092 (805)	3306B
3400	3406B	187 - 300	(250 - 402)	14.6 (893)	137 x 165	(5.4 x 6.5)	1-6	1401 (1030)	to 1816 (1335)	3406B
	3408B	238 - 375	(319 - 503)	18.0 (1099)	137 x 152	(5.4 x 6.0)	V8	1757 (1296)	to 2167 (1598)	3408B
	3412	317 - 559	(425 - 75)	27.0 (1649)	137 x 152	(5.4 x 6.0)	V12	2462 (1816)	to 3375 (2489)	3412
3500	3508	507 - 745	(680 -1000)	34.5 (2105)	170 x 190	(6.7 x 7.5)	V8	3608 (2654)	to 4595 (3379)	3508
	3512	760 -1118	(1020-1500)	51.8 (3158)	170 x 190	(6.7 x 7.5)	V12	5732 (4214)	to 6445 (4739)	3512
	3516	1010 -1491	(1355-2000)	69.0 (4210)	170 x 190	(6.7 x 7.5)	V16	7220 (5307)	to 8492 (6244)	3516
3600	3606	1270 -1845	(1700-2475)	110.8 (6764)	280 x 300	(11.0 x 11.8)	1-6	17347 (12755)	to 19447 (14299)	3606
	3608	1680 -2485	(2250-3330)	147.8 (9018)	280 x 300	(11.0 x 11.8)	1-8	22958 (16881)	to 26164 (19238)	3608
	3612	2535 -3690	(3400-4950)	221.7 (13527)	280 x 300	(11.0 x 11.8)	V12	34694 (25510)	to 38892 (28597)	3612
	3616	3360 -4965	(4500-6655)	295.6 (18036)	280 x 300	(11.0 x 11.8)	V16	45918 (33763)	to 52288 (38447)	3616

5/86

$3-Million Navy Contract Received By E-Systems —Literature Available

E-Systems has announced a $2.9-million U.S. Navy contract to provide continuing systems engineering support services for the AN/SYR-1 downlink communications set used with Terrier and Tartar missiles. The work will be performed at the ECI Division in St. Petersburg, Fla.

The contract with the Naval Sea Systems Command calls for a variety of engineering, technical and computer program tasks for support of the program.

The AN/SYR-1, designed and built by the ECI Division, is a shipboard system which receives and processes data from missiles in flight.

For further information,

Circle 91 on Reader Service Card

Bailey Controls Opens New Demonstration Facility —Literature Available

Bailey Controls Company of Wickliffe, Ohio, has completed the construction of their new process control demonstration facilities. Located at the company's headquarters, the facility offers guests a chance to observe the operation of process plants, power generation facilities, marine vessels, and ocean platforms without ever leaving this administrative and manufacturing center in suburban Cleveland.

The new demonstration area is three times larger than previous facilities, and was built in response to increasing demand for the Bailey Network 90 Control System now in use at over 3,000 locations around the world. Network 90-equipped installations include power stations, steel mills, pulp and paper mills, refineries, chemical plants and food processing plants.

Distinctly futuristic in design, the new Bailey demonstration facilities include two control rooms—The Network 90 Presentation Theatre and the Control Room of the Future—plus a well-appointed reception lounge and a spacious exhibit area.

The Network 90 Presentation Theatre seats twelve guests and displays the Network 90 System for plantwide process control. The room is outfitted with large screen audio-visual equipment to display process application information.

The Control Room of the Future also accommodates up to twelve guests, and includes a series of operator interface stations which can show simultaneous actual and graphic images of the various processes being controlled. Featured is the Bailey Management Command System, a high-level, CRT-based system which can provide a monitoring and control for up to 30,000 points throughout a manufacturing facility. Building upon this technology, Bailey will use the Control Room of the Future to showcase other emerging technologies in the field of process control.

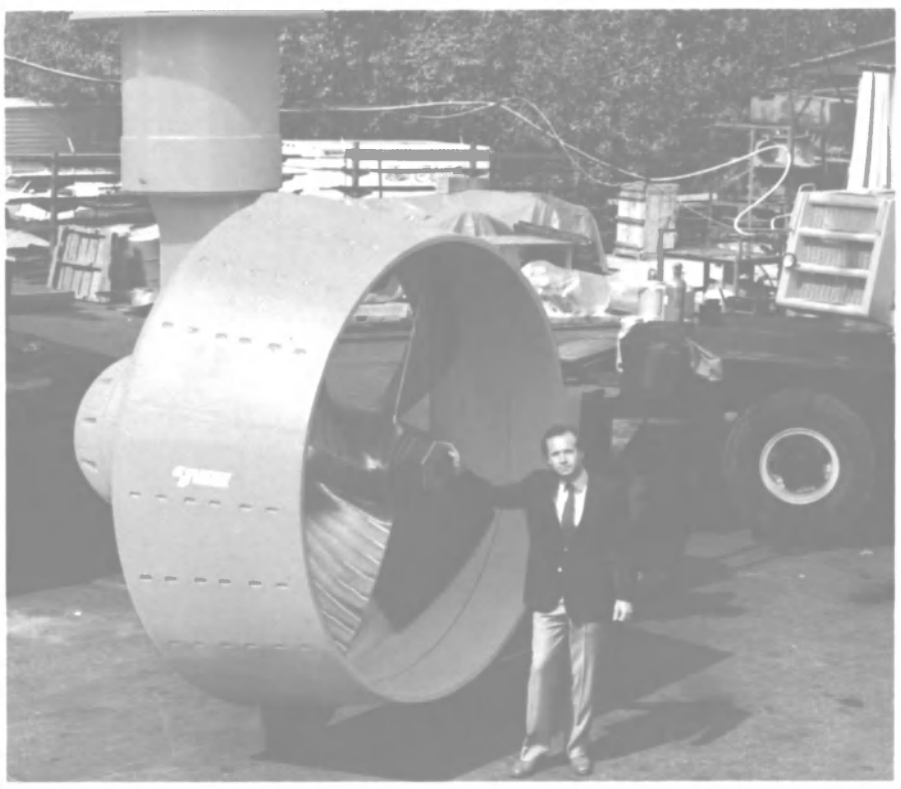
"The demonstration facility was designed to provide Bailey guests with an opportunity to examine and experience the many capabilities of Network 90, a process control system which we expect to see well into the 21st Century," explains Bailey vice president of marketing, **Larry Enterline**.

Network 90 is based on microprocessor architecture designed to take advantage of what is characterized as the "transparent technology approach," that is, the system's ability to continually incorporate improvements and thereby avoid obsolescence. This approach allows Network 90 to benefit from both existing technology as well as the most sophisticated state-of-the-art advancements, maintaining it at the "cutting edge" of process control applications.

For free literature on Bailey Controls' Network 90,

Circle 73 on Reader Service Card

Circle 168 on Reader Service Card ➔



Ulstein Maritime Reports On Z-Drive Success
—Brochure Available—

Since becoming part of the worldwide Ulstein Group in 1984, Ulstein Maritime has achieved major success in areas outside their traditional North American market. Recent orders received include two 2,000-hp Z-Drives for McTay Shipyards in the U.K., to be installed in a coastal tug; two 1,000-hp Z-Drives for a ferry being constructed at Eglo Shipyard in South Australia for operation out of Adelaide (through Hawker Siddeley, Australia); and four 800-hp Z-Drives for Indonesia.

In North America orders for five 1,500-hp deck-mounted Z-Drives for dredges have recently been received. Two were commissioned in December on the dredge Newport. These include the latest steering and clutch systems. Also, Ulstein Maritime recently commissioned two 2,000-hp, 360-degree steerable Z-Drive propulsion systems on the tug Winslow C. Kelsey, constructed at Eastern Marine in Florida for the Electric Boat Division of General Dynamics in Connecticut.

Reg Allen, president and general manager of Ulstein Maritime shown with a 2000 HP Model 1650 H Z-drive propulsion unit.

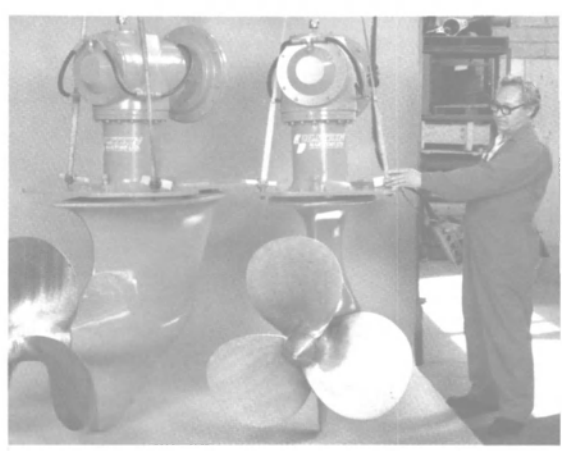
The U.S. Navy continues to be a major customer, a 1,200-hp D.C.-driven thruster was commissioned on the MSC Observation Island, and six 500-hp diesel drive deck-mounted unit packages are on order for propulsion of U.S. Navy crane barges.

The Strut Drive non-steerable, right-angled drive unit for high-speed vessels with power up to 650 hp, under development for the last three years, is receiving acceptance for crew and pilot boats, but is being more widely applied in the large luxury yacht market due to its unique features. The latest installation is a high-speed passenger vessel running from North Vancouver to the Expo 86 site. Sparkman and Stephens, the world-famous yacht designers, have specified the MC-500 Strut Drive in the new Stevens Custom 58, of which two vessels are on order.

The company reports it has a strong team of design engineers to ensure that Ulstein Maritime keeps in the forefront of technology, both for Z-Drives and its control systems.

Ulstein Maritime has also manufactured major portions of the Ulstein controllable-pitch propeller systems on a number of projects, including two 1,500-hp systems for the retrofit of the Canadian Coast Guard vessel Narwhal being constructed in Halifax. Controllable-pitch tunnel thrusters were commissioned on the Canadian Coast Guard vessel Samuel Risley, and the Department of Fisheries and Oceans vessel Leonard J. Cowley. The first of six Ulstein Maritime-designed fixed-pitch thrusters for Canadian Coast Guard 1100 vessels was commissioned on the Martha L. Black, constructed at Versatile Pa-

The Ulstein Maritime Model MC-500 Strut Drive.



cific Shipyards Inc. in North Vancouver.

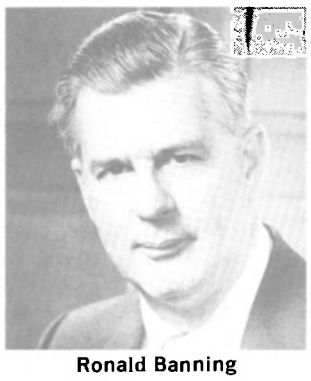
In January, two 3,000-hp C-P propeller systems were commissioned on the seismic vessel New Venture owned by Edison Chouest Offshore of Louisiana. This company has also ordered three Ulstein C-P systems for an anchor-handling supply vessel now under construction.

From the above-mentioned successes, it is clear that Ulstein Maritime has considerably expanded its marketing areas, its product ranges and customer acceptance.

For fully illustrated detailed brochures containing more information on Ulstein Maritime products,

Circle 52 on Reader Service Card

Banning Named Director Of Technical Services For Versatile Pacific



Ronald Banning

Versatile Pacific Shipyards Inc. of North Vancouver and Victoria, B.C., Canada, has announced the appointment of **Ronald H. Banning** as director of technical services. He will direct the company's technical services overall, including the production of design drawings, computer-assisted design and drafting, detailed engineering studies, and will also provide support for estimating and materials purchasing.

For the past five years Mr. **Banning** has been involved with sales engineering for marine propulsion equipment and has worked as an engineering consultant, including assignments for both Versatile Pacific and Versatile Corporation.

From 1974 to 1980 he served with Burrard Yarrows Corporation (now renamed Versatile Pacific Shipyards), first as chief engineer and then as operations manager.

For complete information on Versatile Pacific's facilities and capabilities,

Circle 12 on Reader Service Card

Metropolitan Offers Full Bronze Valve Stock

Metropolitan Plumbing Supply Corporation is offering a wide variety of bronze valves up to 26 inches, including: globe, angle, gate, cross, swing check, vertical check, horizontal lift check, hose angle, hose gate and hose globe.

For further information on Metropolitan Plumbing bronze valve stock,

Circle 35 on Reader Service Card

Degree In Small Craft Naval Architecture Offered By YDI Schools

Located on the campus of the Maine Maritime Academy in Castine, Maine, YDI Schools has developed a two-year program which leads to an associate of applied sciences (AASc) degree in small craft design.

The associate degree program has been developed in order to offer students an integration of academic classes and practical hands-on skills. The curriculum is a blend of professional courses taught by the YDI faculty and academic courses offered through the Maine Maritime Academy.

All YDI students have access to the academic and recreational facilities of the Academy. The academic facilities include: a 55,000-volume library, a writing laboratory, an academic computing center, a physics tutor program and a mathematics laboratory.

For a free color brochure detailing the entrance requirements and curriculum offered at YDI,

Circle 75 on Reader Service Card

Montreal Group Plans To Modernize 150-Year-Old Yard In Nova Scotia

Negotiations are taking place between the Provincial Government of Nova Scotia, Canada, the new owner of Good People Sea and Shore Services repair yard, aimed at modernizing the 150-year-old facility, including increasing its hauling capacity from 350 to 1,200 tons.

The repair yard is located in North Sydney Harbour, Cape Breton, Nova Scotia. North Sydney is the main ferry link to Canada's 10th province, Newfoundland, and also has a regular service to the French Islands of St. Pierre et Miquelon. It is also the East Coast start of the Trans-Canada Highway.

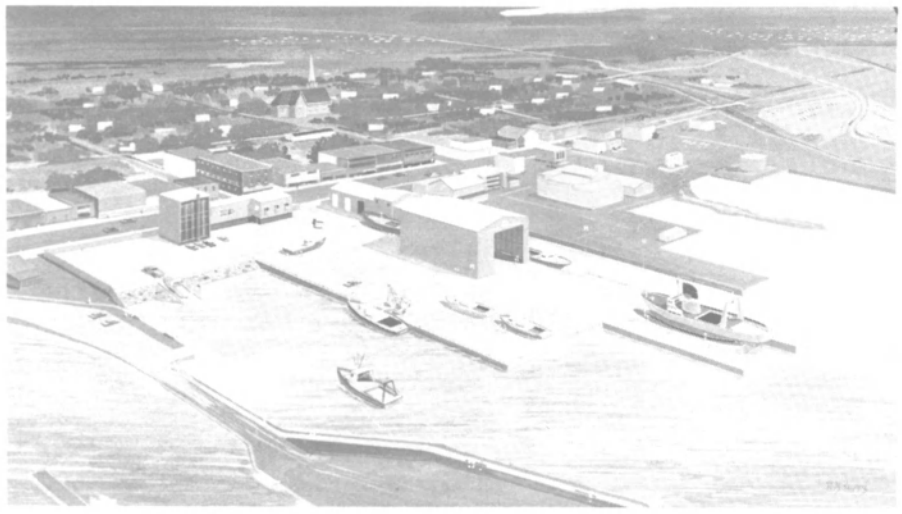
The shipyard has been purchased by a group headed by **Dory Tuvim** of Montreal, with intentions of establishing an offshore-related facility to serve the promising fields off the coasts of Nova Scotia (Venture) and Newfoundland (Hibernia).

While oil markets stabilize and these oil fields become operational, the company has turned to the traditional customers—the many fishing fleets operating around Cape Breton and Newfoundland.

The antiquated slipway at the Good People yard, with its 350-ton-capacity cradle, will be replaced with a shiplift of approximately 1,200 tons capacity. A new transfer system will also be installed, permitting vessels to be moved into a building for year-round refit and repairs.

The present water basin will be back-filled, doubling the yard's area from three to six acres. The machine shop will be completely modernized, a fueling station activated, and a haulway for smaller vessels and yachts installed.

The company is also servicing oceangoing ships that frequent Sydney Harbour. It recently completed a major contract by assisting Versatile Davie Shipbuilding of Lauzon, Quebec, to bring into service the new and world's largest Arctic class icebreaking ferry, CN Marine's 587-foot Caribou.



Work on the Caribou utilized all trades employed at the Good People yard—welders, shipwrights, pipefitters, electricians, plumbers, carpenters, and hydraulic experts.

For further information on this North Sydney shipyard,

Circle 34 on Reader Service Card

Verolme Botlek Shipyard Busy With Repairs And Conversions —Brochure Available

Ships that were in Verolme Botlek yard recently for drydocking and/or repairs included (front to back) tanker Team Hada, freighter Alphacca, and gas carrier Golar Petrosea.

In just one week's time recently four vessels and two drilling rigs arrived at the Verolme Botlek shipyard in Rotterdam for drydocking, repairs, or conversion.

This resulted in the simultaneous drydocking of the tanker South Vivien for 100 tons of steel renewal, together with the jackup rig Maersk Explorer for its special survey.

Upgrading of the jackup rig Britannia and the conversion of the semisubmersible drilling rig Neddrill 6 were longer-term projects. The former was redelivered in April and the latter is scheduled for an August delivery.

For further information and a free full-color brochure describing and illustrating the Verolme Botlek facilities and capabilities,

Circle 15 on Reader Service Card

Atlas-Danmark Expands Line Of Sludge/Waste Incinerators —Catalog Available

Atlas-Danmark Marine and Offshore of Denmark has expanded its sludge and solid-waste incinerator line with the addition of three advanced series of incinerators with increased capacity and flexibility. The units employ new high efficient combustion technology, making substantial cuts in production costs possible.

The newly developed Atlas Combi Tubon, Atlas Maxi, and Atlas Maxi Tubon types of incinerators will be marketed jointly with the well-known ASWI 402 program. The expanded incinerator line covers capacities ranging from 200,000 kcal/h to 1,500,000 kcal/h, and allows any proportion between sludge and solid waste. The maximum capacity of solid waste is 12,000 kg per day, and the corresponding figure for oil and sewage sludge is 7,200 kg per day. The incinerator program comprises both units for simultaneous combustion of solid waste and sludge and units for combustion of either only.

The incinerators can be ordered with devices for automatic waste feeding, ash removal and heat recovery. Waste heat may be employed for the production of freshwater in an Atlas-Danmark Freshwater Generator as supplement to the freshwater normally produced by utilizing the waste heat in the jacket cooling water from the ship's diesel engines and/or the exhaust gas. Atlas-Danmark Freshwater Generators operating on waste heat have capacities ranging from 1 to 1,000 tons per day.

For a free copy of a full-color catalog available from Atlas-Danmark on their expanded line of incinerators,

Circle 16 on Reader Service Card

Ships Parts Awards $7.7-Million Contract To Hughes For Ship Radar

Hughes Aircraft Company, Ground Systems Group, Fullerton, Calif., is being awarded a $7,674,312 delivery order under a basic ordering agreement to furnish 530 end items for component repair services for system support to SLQ-17A, SPS-39A and SPS-52 surveillance radar equipment used on-board ships. Work will be performed in Anaheim, and is expected to be completed March 31, 1987. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-84-G-A037).

Hyundai Now Leads World In Merchant Ship Output

Hyundai Heavy Industries in Ulsan, Korea, has taken over the title of the world's leading shipbuilder by surpassing Japan's Mitsubishi Heavy Industries in gross tonnage completed during 1985. During that year, Hyundai's output was 1.32 million gt compared with Mitsubishi's 1.1 million gt.

The Korean yard's record production had been expected, considering its great success in acquiring contracts during 1983 and 1984. At one stage the yard had an orderbook totaling more than 2.3 million gt, excluding offshore structures.

'86 Ship Production Symposium Scheduled For August in Williamsburg

Design and production concepts to reduce shipbuilding schedules and costs is the theme for the 1986 Ship Production Symposium to be held at the Williamsburg Lodge August 27-29, 1986 in Williamsburg, Virginia.

The reduction of shipbuilding schedules and costs is a vital necessity recognized by all in the maritime industry. New design and production concepts play a major role in the achievement of this goal. The National Shipbuilding Research Program 1986 Ship Production Symposium includes technical presentations that cover a diversity of topics. This outstanding three-day program developed by the 1986 Ship Production Symposium Steering Committee headed by **W. R. "Pat" Phillips, Jr.** provides a forum for the presentation of the latest developments in design and production concepts, which will affect schedules and costs dramatically over the next decade.

The Technical Program Committee, chaired by **R. L. Harrington** has selected 23 stimulating and thought-provoking papers by authors both nationally and internationally that cover the range of subjects being addressed by the Ship Production working groups. The program outline with authors and papers is available in the Technical Program for the 1986 Ship Production Symposium.

This well rounded program has been arranged to take advantage not only of state-of-the-art technical subjects but also the Virginia Peninsula and its wealth of history. Special activities and social events planned include a keynote luncheon address by VADM **J. H. Webber;** the presentation of the Kennedy Award by **Perry W. Nelson,** president of the Society; a bus tour of the construction facilities at Newport News Shipbuilding followed by a reception on Wednesday. On Thursday, a tour of Carter's Grove Plantation and High Tea at the Williamsburg Lodge and the world famous Groaning Board Banquet complete with colonial entertainment is scheduled for the afternoon and evening respectively; and on Friday a presentation on the reconstructed Godspeed with a tour of the ship on Friday afternoon.

For additional information and a copy of the symposium brochure contact: **C. B. Woolard, Jr.,** Registration Chairman, 1986 Ship Production Symposium, P. O. Box 315, Newport News, Va 23607.

Robotic Visions Receives $5.5-Million Modification For Machining System

Robotic Vision Systems Incorporated, Hauppauge, N.Y., is being issued a $5,500,000 modification to a cost-plus-fixed-fee contract to furnish one propeller machining system, supporting software and associated technical data to complement the Integrated Comprehensive Automated Manufacturer of Propellers (ICAMP) facility at the Philadelphia Naval Shipyard. Work will be performed in Hauppauge, and is expected to be completed in June 1987. The Naval Regional Contracting Center, Philadelphia, Pa., is the contracting activity (N00140-83-C-2001).

Sulzer Diesels Will Power Townsend Cross-Channel Passenger/Vehicle Ferries —Literature Available

Townsend Car Ferries Ltd. of the U.K. has selected Sulzer ZA40S medium-speed diesel engines, which will be built by CCM Sulzer of Mantes, France, for its large cross-Channel, passenger/vehicle ferries. Ordered from Schichau Unterweser AG in West Germany, the two new vessels will each have three 14-cylinder engines having a combined output of 31,500 bhp at 510 rpm. Each engine will drive a controllable-pitch propeller ordered from Sulzer-Escher Wyss GmbH of Ravenburg, West Germany. The center propeller will be capable of being fully feathered; service speed will be 22 knots.

The Sulzer ZA40 medium-speed design and its latest longer-stroke ZA40S version have become popular for new ferries. Including the two new Townsend vessels, there have been 26 units of these engines ordered for six large ferries, the others being for Anders Jahre, North Sea Ferries, and SNCF.

The two 20,000-gt Townsend ferries will be the largest ever built for cross-Channel service. With accommodations for 2,400 passengers and 700 cars, they will operate on the Dover-Calais route. Townsend's three Spirit of Free Enterprise Class ferries on this route since 1980 are reported to have had highly satisfactory service from their triple Sulzer 12Z40 main engines.

The two new ferries will in fact have complete Sulzer engine installations. Auxiliary power will be provided in each ferry by four 8-cylinder Sulzer AT25 diesels, each of 2,160 bhp at 1,000 rpm. These will burn the same grade of heavy fuel oil as bunkered for the main engines.

For further information and free literature on Sulzer engines,

Circle 95 on Reader Service Card

Free Literature Offered On Lang Convection Ovens For Marine Use

Lang Manufacturing Co., a galley equipment manufacturer located in Redmond, Wash., working in conjunction with Commander **Jack Gedney** and Navy food service personnel, has developed two new galley items.

The Model RF-30 double convection oven range is a modular construction unit designed to pass through a 25-inch submarine hatch and for assembly inside a galley.

The Model ECO-M, a full-size convection oven, is 25 inches in height, allowing passage through a 26-inch by 66-inch watertight door.

Both items can be installed without the additional expense of hull or bulkhead cuts.

For further information and free literature on Lang Galley Equipment,

Circle 99 on Reader Service Card

NUMBER 1

MARITIME REPORT

ALONE DELIVERS YOUR ADVERT TO MORE MARINE BUYERS THA ANY OTHER TWO MARINE MAGAZINES COMBINED.

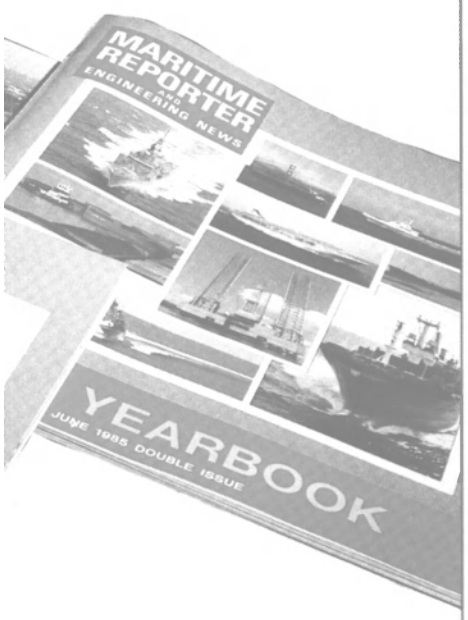
In 1985, MARITIME REPORTER's total circulation increased again to a record 24,305 copies every issue . . . the largest total requested circulation of any marine magazine in the world.

This entire increase consisted of only Buying Influence Readers. MARITIME REPORTER now delivers your advertising to an unequalled 21,609 buying influence readers . . . thousands more than any other Marine magazine in the entire world . . . and, more than any other two marine magazines combined.

THE UNITED STATES is the largest marine market nation in the world . . . offers greater potential for marine sales than any other country.

MR HAS THE LARGEST TOTAL U.S. CIRCULATION . . . thousands larger than No. 2, ME/Log . . . including thousands more U.S. marine buyers than ME/Log or any other marine magazine in the world.

YOUR MOST POWERFUL MARINE A



TER

ISING

N

WORLD'S LARGEST CIRCULATION TO BUYERS

1985—MARITIME REPORTER's total circulation increased to 24,305 including a record 21,609 Buying Influence Readers.

COMPARE CIRCULATION TO BUYERS

	MARITIME REPORTER	ME/Log	WATERWAYS JOURNAL	THE WORKBOAT
BUYERS	21,609 89%	15,107 60%	2,347 34.2%	?
NON-BUYERS AND UNIDENTIFIABLE MIXED GROUPS	2,696 11%	10,028 40%	4,526 65.8%	?
Total Requested Circulation	24,305	22,745	6,873	9,985
Unrequested free copies	0	2,390	0	3,046

WORKBOAT does not report titles of all readers, Presidents, Vice Presidents, Treasurers, Purchasing Agents, etc. Impossible to identify number of buyers reached.

Circulation audit bureaus do not identify buyers.
Identification of BUYERS is based on a 1984 survey, commissioned by MARITIME REPORTER, of over 1,000 marine sales managers who identified true buyers as shoreside management, design and purchasing people in vessel operations, shipbuilding and design (naval architects). Signed and dated replies on file at MARITIME REPORTER.

RECORD SALES LEADS FOR ADVERTISERS

MARITIME REPORTER produces more and better sales leads than any other marine magazine... two times and three times more than the number 2 magazine. Each figure listed represents inquiries produced for an individual advertiser by MARITIME REPORTER in one year or less.

PAINT CORROSION CONTROL	SHIPBUILDING/REPAIR
1,033	2,147
714	613
655	570

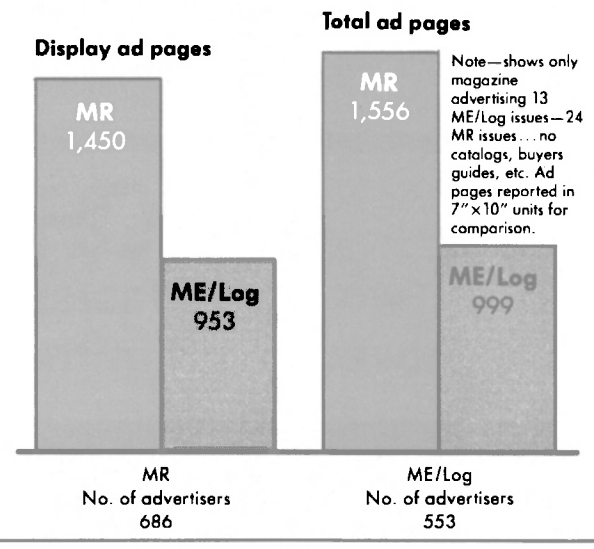
DECK MACHINERY/ CARGO HANDLING	DIESEL ENGINES
545	1,533
415	1,352
477	1,168

NAVIGATION & COMMUNICATIONS	OILY WATER SEPARATORS
773	936
663	751
623	459

THE ADVERTISING LEADER

In 1984, and for years, more media buyers placed more pages of advertising, for a larger number of advertisers, in MARITIME REPORTER than in No.2 ME/Log.

COMPARE 1984 ADVERTISING



NUMBER 1 THE WORLD'S MOST SUCCESSFUL MARINE MAGAZINE

By their actions, the most important people in the marine industry – the readers and the advertisers – have voted MARITIME REPORTER NUMBER ONE.

- **WORLD'S LARGEST TOTAL REQUESTED CIRCULATION**
- **LARGEST TOTAL US. CIRCULATION**
- **THOUSANDS MORE BUYING INFLUENCE READERS**
- **LARGEST NUMBER OF ADVERTISERS**
- **LARGEST NUMBER OF AD PAGES**
- **BEST RESULTS—LARGEST NUMBER OF INQUIRIES FOR ADVERTISERS**

118 East 25th Street
New York, New York 10010
212-477-6700

MARITIME REPORTER AND ENGINEERING NEWS

DVERTISING SALES FORCE FOR '86

Free 12-Page Catalog On Combustion, Pollution And Energy Control Equipment

A new free illustrated catalog is now available from National AirOil Burner Company, Inc. (NAO), Philadelphia, Pa., fully describing combustion equipment for the power generation, petroleum and offshore oil industry.

The well-illustrated catalog contains photos and drawings for the company's complete line of equipment and includes descriptions of each product group. In addition, each product group is keyed with bulletin and data sheet numbers. The bulletin and data sheets contain far more extensive information and may be requested from the company by number.

Product lines illustrated include air heaters (direct fired); castable refractories; detaching gears; energy conservation and safety; flare pilots and ignitors; flare-tip configurations; flaring and venting systems; fluidic seal; ground flares; inert-gas generators; offshore flaring; oil guns and torches; process burners; process sprayers; regulating valves; safety interlocks; thermal oxidizers; vapor disposal units; water seals and knock-out drums; and waste-liquid disposal.

An internationally known manufacturer of combustion and pollution equipment, NAO serves the petroleum process and petrochemical industries worldwide.

NAO domestic clients include widely recognized companies such as Allied Chemical, Amoco, Chevron, Dow Chemical, Dupont, Exxon, Monsanto, Texaco, and Union Oil.

NAO equipment is purchased by notable companies throughout England, Canada, Scotland, Norway, Venezuela, Mexico, Australia, India, Japan, Holland, Korea, Indonesia, the Philippines, Saudi Arabia, Spain, the North Sea region and most European countries.

Since its founding, NAO has expanded five times with a growing staff of more than 50 at its headquarters. NAO maintains branch offices in Houston, Texas; Tokyo, Japan; Milan, Italy; London, England, and has agents around the world.

For your free copy of the informative NAO catalog,

Circle 6 on Reader Service Card

Marathon Offers Full-Color Brochure On Metal Fabrication Services

A new, eight-page, full-color brochure presents the range of metal fabrication capabilities provided by Marathon LeTourneau for industrial and marine construction markets.

This new publication highlights Marathon LeTourneau's integrated steel production, engineering expertise, metal fabrication and assembly capabilities. It also provides detailed information on capacities at the company's steel mill and structural pipe mill and lists specific capabilities of the plate shop and automated panel line. In addition, there is information on fabrication and assembly area craneage capacities and a list of regulatory agencies whose requirements Marathon LeTourneau meets.

Photographs show the range of fabricated metal structures which the company can complete, the types of marine vessel modifications that have been performed, and the sophisticated piping and electrical systems that have been installed.

For your free copy of this full-color brochure detailing the metal fabrication capabilities of Marathon LeTourneau,

Circle 11 on Reader Service Card

Gems Sensors Designs Flow Switch For Low-Cost High-Volume OEM Use

A new flow switch has been designed by Gems Sensors Division for low-cost, high-volume OEM use. The in-line switch, Model FS-65090, offers a reliable method of protection against loss of flow.

Made of molded PVC material, the switch features a unique cam-action paddle with a magnet that actuates a reed switch within the housing. Other wetted parts are a stainless steel spring and a ceramic magnet. Units are provided with 1½-inch IPS ports.

Flow setting is 7-19 gpm on increasing flow and 5-16 on decreasing flow. These switches withstand temperatures to 125°F, and provide low pressure drop of 5 psi at 50 gpm.

This switch is ideal for protection against loss of flow to pumps or heaters, and is also suitable for chemical processing or batching applications.

For further literature containing full information,

Circle 60 on Reader Service Card

Free 16-Page Full-Color Brochure On Compressors Offered By Atlas Copco

A free sixteen-page full-color brochure on Atlas Copco compressors, coolers, dryers and other accessories, has been made available from the company's Rental Division, 70 Demarest Drive, Wayne, N.J. 07470.

Bearing the cover caption "Rental Air Where You Need It—When You Need It," the publication explores the variety of compressors and applications available from Atlas Copco Rental when industry needs emergency or supplemental compressors. The manufacturer says that when the compressor reaches the site, it can be easily connected and maintained by the renter's own plant personnel, integrating into the system without delay and without having to hire costly factory maintenance crews.

One type of compressor described is the Atlas Copco PNS-1200 that provides high-pressure air that is highly portable. This machine delivers 100 percent oil-free air with a discharge flow of 1,200 cfm at up to 290 psig. It is depicted as being super quiet, compact and highly portable so it can be wheeled to wherever it is needed to get the job done. Typical examples of how industry is currently using the PNS-1200 include: soot blowing; textile texturizing and interlacing; catalyst regeneration; pipeline pressurization; pipeline cleaning; deep hole gas drilling; papermaking and processing; chemical processing; and industrial processing.

Portable diesel-drive compressors that also deliver 100 percent oil-free air are another type discussed. They feature 58 to 150 psi variable pressure range; completely air-cooled—no antifreeze belts or water hose; standard manifold and oil pan heaters for fast cold-weather starting; silent operation and compact size; and easy operation and maintenance.

The other compressor featured in the brochure is the electric drive ZT-3 and ZT-4, available in skid-mounted models or the portable PTSE. Completely air-cooled and weather protected, they can be installed without expensive water piping.

One page of the publication presents the complete package/system offered by Atlas Copco Rental should it take more than just a compressor to do a job. Accessories include dryers from 35° F to −40° F dew point; after coolers and separators; hoses and fittings; manifolds; auxiliary fuel tanks; receivers; pressure reducing valves, etc.

Handy loose-leaf three-hole-punch pages that list model numbers, specifications, dimensions, etc., for various types of rental units are included in the package.

The publication, which is well illustrated with color photos of the various compressors and equipment, also gives a list of rental service centers around the U.S.

For further information and a free copy of the Atlas Copco Rental brochure,

Circle 5 on Reader Service Card

SAIT Radio Telex Now Compatible With IBM PC —Literature Available

SAIT, Inc. general manager, **Chris Courard,** has announced that SAIT XH 5112 Radio Telex System is fully compatible with the IBM PC© or IBM compatible computers. Utilizing Crosstalk© software, the PC interface consists of one additional printed circuit board with external ports. The system memory is expanded from the standard supplied 32 K to 64 K.

With this feature, a computer in an office can link directly with another computer onboard a ship via two XH 5112 radio telex modems, one at the sending and one at the receiving end. Alternately, communication can also be accomplished via a coast radio station with radio telex capability, for example, WCC or WLO. This capability was previously available via the Inmarsat system with equipment cost in the range of $35,000.

With the SAIT XH 5112 Radio Telex, the same technology is available for a system equipment price of $4,995, FOB New York.

For free literature and additional information,

Circle 55 on Reader Service Card

MMA Meeting Draws Immediate Return Engagement By DLA's General Morgan

At the conclusion of his morning presentation that outlined the Defense Logistic Agency's (DLA) organization and operation, Maj. Gen. **Joseph Morgan,** USAF, DLA executive director for quality, received a barrage of questions, complaints, and comments from maritime industry members at the latest Marine Machinery Association (MMA) Government/Industry Forum. Upon his return to DLA headquarters in Alexandria, Va., General **Morgan** immediately conferred with his top civilians. A phone call to MMA executive director **Daniel Marangiello** resulted in a rescheduling of events so that General **Morgan** and four of his deputies—**Ernest Ellis, Ivan Snyder, Aldo Domenichini,** and **Brian Schutsky**—could return to the meeting to answer, clarify, and amplify the items left hanging after the morning session.

The resulting exchanges between the DLA executives and MMA members clearly demonstrated the dedication and concern for quality by General **Morgan,** his staff, and the marine industry. The general and his top executives returned to the meeting not to defend the DLA and its actions but to get the facts and resolve the issues presented. The DLA acts as the procurement and inspection agent for the individual services, and as such purchases and inspects to standards and specifications called for by these services—no more and no less. General **Morgan** requested specifics of any case to the contrary, and promised immediate remedial action if violations exist. He invited the MMA to participate on the Quality Executive Committee composed of top-level executives from DLA, NAVSUP, NAVSEA, and NAVAIR.

After brief opening remarks, Mr. **Marangiello** introduced Dr. **Alfred Skolnick,** president of the American Society of Naval Engineers (ASNE). Dr. **Skolnick** noted that while ASNE is 98 years old and MMA just over two years old, both organizations are dedicated to improving the technical excellence of the U.S. Navy. He wished MMA success in achieving its goals, which are:

- To provide the fleet with quality systems, machinery, equipment, parts, and services that will insure safe and reliable operation at fair and reasonable prices;
- To foster honest and fair competition; and
- To demand ethical business practice from both industry and government.

Rear Adm. **Roger Horne,** USN, NAVSEA deputy commander for facilities and industrial management, followed General **Morgan's** morning appearance. He demonstrated a thorough understanding of industry's concerns and an appreciation of the cost of maintaining R&D, engineering, and service personnel. He also acknowledged that without OEMs and their responsiveness to fleet problems, and their

At the recent Marine Machinery Association meeting, **Tim O'Sullivan,** president of Fairbanks Morse Engine Div., Colt Industries (center), introduces the keynote speaker, Congressman **Les Aspin,** Chairman House Committee on Armed Services (left) as **Dan Marangiello,** ORI, Inc., executive director of MMA (right) looks on.

innovative ideas to solve the challenging demands for newer and more capable equipment, the Navy would be severely handicapped. He was quick to point out, however, that the Navy must comply with the provisions of the Competition in Contracting Act. NAVSEA, he said, is attempting to develop a contractual arrangement whereby the Navy will protect the proprietary interests of the OEMs, specifically on critical components, while in turn the OEMs will assist NAVSEA In obtaining competition for the non-critical components.

Admiral **Horne** is continuing to work with the Competition Advocate of the Navy and the legal staff to obtain a fair and equipable solution to this complicated issue. Responding to a suggestion by Capt. **James Knorr,** deputy head of NAVSEA's machinery group, that OEMs participate in Fleet H, M, & E conferences, Admiral **Horne** indicated that the idea had merit and he would look into it.

Following a reception and luncheon, **Timothy V. O'Sullivan,** president of Fairbanks Morse Engine Division of Colt Industries, introduced Congressman **Les Aspin** (D-WI), the keynote speaker. The chairman of the House Committee on Armed Services, Mr. **Aspin** outlined the difficulty in balancing the budget and the difficult decisions facing the Department of Defense, the Congress, and the President.

In the past, Congress merely cut here and squeezed there, forcing the DoD to make programatic adjustments. No longer will this suffice, he explained, as serious cuts that can impact national defense policy will be required to reach the bottom line. Secretary of Defense **Caspar Weinberger,** he said, might be asked to furnish the Armed Services Committee with a priority list, which panel members will use to arrive at the final budget authority figure. Cuts of as much as $38 billion may be required, resulting in a $282-billion defense budget.

When asked his opinion on how the Supreme Court would rule on the Gramm-Rudman-Hollings law, Mr. **Aspin** felt that the Court would uphold the lower court decision striking down only the automatic feature of the law, and leaving Congress to decide on the specific cuts to be made to remain within the deficit reduction total. During this question and answer session, the Congressman acknowledged the concerns of the OEMs, and extended an invitation for the MMA to testify before his committee.

In the afternoon session, restricted to MMA members, ex-Congressman **Robert McClory** provided an in-depth insight on how to conduct effective communications with elected officials. Calling on his 20 years of experience as one of the most highly respected members of the House, Mr. **McClory** gave the members some excellent pointers and advice.

The remainder of the afternoon session was devoted to organizing working committees to pursue the groundwork established at this and previous MMA meetings. At the conclusion of the meeting, attendees expressed satisfaction with the results. It is apparent that MMA is making headway and being looked upon by the DoD and the Navy as a valuable ally in working out solutions to the problems that are plaguing both the Navy and the industry.

Non-members interested in joining the Marine Machinery Association or attending the next meeting should contact executive director **Daniel Marangiello** at (703) 553-1821.

New York City Marine Society Celebrates 216th Annual Dinner

The Marine Society of the City of New York recently held its 216th consecutive Annual Dinner, at the Plaza Hotel. Throughout its long history, the Society has honored persons in the maritime community who have contributed their time, talent, and expertise. This year's guest of honor and principal speaker was **Robert F. Cahill,** executive vice president of the Statue of Liberty-Ellis Island Foundation Inc., the group responsible for the restorations.

Prior to joining the Foundation, Mr. **Cahill** was executive vice president-operations for the GTE Communications Group in McLean, Va. He spent 26 years with GTE in a number of managerial positions dealing with operations and finance, both internationally and domestically. He was directly responsible for the sales of the GTE Consumer Products Group to corporations in Europe, Latin America, the Far East, and the U.S.

Principals at recent New York Marine Society Annual Dinner included (L to R): Capt. **Elmer W. Mathes,** dinner chairman and secretary; **Robert F. Cahill,** guest of honor and principal speaker; and Capt. **Conrad P. Nilsen,** president.

Chartered in 1770 by King George III, the Marine Society is a charitable and educational society, the regular membership being composed entirely of shipmasters who must be, or have been, captains of merchant vessels under the U.S. flag. Others may be admitted as honorary members. An early honorary member of the Society was Gen. **George Washington,** who joined in 1783.

The Society has endeavored to improve maritime knowledge, and it has relieved, insofar as possible, the needs of more than 5,000 distressed shipmasters, and their widows and orphans.

Current officers of the Society are: **Conrad P. Nilsen,** president; **George C. Previll,** 1st vice president; **F. Shellenbarger,** 2nd vice president; **Elmer W. Mathes,** secretary; **Bertram O. Christensen,** treasurer; and **Wilbur E. Dow Jr.,** attorney.

$55-Million Contract To Newport News For SSN-688 Submarine Work

Newport News Shipbuilding and Dry Dock Company, Newport News, Va., is being awarded a $55,000,000 modification to a previously awarded cost-plus-fixed-fee contract for Los Angeles (SSN-688) class submarine design agent and planning yard services. Work will be performed in Newport News (91 percent); Asheville, N.C. (4 percent); Philadelphia, Pa. (3 percent), and Milwaukee, Wisc. (2 percent), and is expected to be completed September 30, 1986. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-70-C-0238).

PROFESSIONAL

(718) 939-4422

AERO NAV
LABORATORIES, INC

14-29 112th Street, College Point, N.Y. 11356
Navy-Hi Shock, Vibration & A.B.S. Testing

AmSEC

AMERICAN SYSTEMS ENGINEERING CORPORATION

Marine Engineers • Port Engineer Services
Systems Analysts • Propulsion Plant Training
Qualified Manufacturer's Field Representatives

P.O. Box 8988 • Virginia Beach, VA 23452 • (804) 463-6666
Philadelphia, PA • Pascagoula, MS • Virginia Beach, VA
Rosslyn, VA • San Francisco, CA • San Diego, CA

Ameritech Corp.

Commercial • Shipbuilding & Repair

7 Belver Avenue, Suite 215
Quonset Pont - Davisville Ind. Park — 401 295-2663
North Kingston, Rhode Island 02852 — 401 295-2664

AMIRIKIAN ENGINEERING CO.
HARBOR AND DRYDOCKING FACILITIES
FLOATING LIFT DOCK AND SHORE TRANSFER
CONCEPTS, DESIGN, INVESTIGATIONS
Chevy Chase Center Office Bldg.
Suite 505, 35 Wisconsin Circle
Chevy Chase, Md. 20015 (301) 652-6903

NAVAL ARCHITECTS MARINE ENGINEERS

ART ANDERSON ASSOCIATES

Bremerton, WA (206) 479-5600
Seattle, WA (206) 622-6221

Captain Astad Company, Inc.
Complete Marine Services - Full Broker Service
Owners Representative Service
Purchase & Sale of All Types of Vessels

CAPTAIN A. J. ASTAD, President
P.O. BOX 53434
NEW ORLEANS, LA 70153
PHONE (504) 529-4171 (24 HRS.)

Ocean Engineering Centre
SHIP-MODEL TESTING

- Resistance Tests • Flow Visualization
- Wake Surveys
- Towed Directional Stability Evaluations
- Seakeeping

For Information Contact:

B.C. Research
Ocean Engineering Centre
3650 Wesbrook Mall,
Vancouver, Canada V6S 2L2
Telephone (604) 224-4331
Telex 04-507748

CDI MARINE CO.
NAVAL ARCHITECTS
MARINE ENGINEERS
EXECUTIVE OFFICE, JACKSONVILLE, FL
904/723-2620

JACKSONVILLE, FL
904/724-9700
CHESAPEAKE, VA 804/543-4211
HAMPTON, VA 804/627-4328
KNOXVILLE, TN 615/693-0545
PHILADELPHIA, PA 609/228-1853
BOSTON, MA 617/878-8340
BREMERTON, WA 206/479-8829
SEATTLE, WA 206/235-0888
PASCAGOULA, MS 601/762-0098
YOKOSUKA, JAPAN 011-81-468-26-1911

A QUALITY TEAM

C.T. MARINE
NAVAL ARCHITECT • MARINE ENGINEER

- TUGS
- TOWBOATS
- BARGES

18 Church Street, Georgetown, CT 06829
Telephone: 203-544-8110
Telex: ITT 4994761

CHILDS ENGINEERING CORPORATION

CHILDS ENGINEERING CORPORATION
Waterfront Engineering
Diving Inspection
BOX 333, MEDFIELD, MA 02052
(617) 359-8945

Thomas Coudon Associates
Marine Equipment Sales

6655 Amberton Drive Baltimore, Md. 21227 (301) 796-2525

CRANDALL
DRY DOCK ENGINEERS, INC.
Railway and Floating Dry Docks
Waterfront Structures • Consulting
Design • Inspection
Dry Dock Hardware and Equipment
21 Pottery Lane Dedham, MA. 02026
Tel. (617) 329-3240 Telex: 924406

C. R. CUSHING & CO., INC.
NAVAL ARCHITECTS, MARINE ENGINEERS
& TRANSPORTATION CONSULTANTS
18 Vesey Street
NEW YORK, N.Y. 10007
TEL (212) 964-1180 CABLE CUSHINGCO
TX: 752481

DLI ENGINEERING CORPORATION

MARINE VIBRATION ANALYSIS NOISE CONTROL

253 Winslow Way West, Bainbridge Island, WA 98110
(206) 842-7656

Measurement, recording and analysis of mechanical, structural and electrical phenomena.

DEL BREIT INC.
MARINE ENGINEERING CONSULTANT
326 Picayune Place Suite 201
New Orleans, La. 70130
(504) 523-2801

DESIGN ASSOCIATES, INC.
M. KAWASAKI
14360 Chef Menteur Highway
New Orleans, Louisiana 70129

Naval Architects
Marine Management

Marine Engineers
Transportation Consultants

Phone: (504) 254-2012 TWX 810-951-5317

ECO Inc.
Ship Design and Engineering
Ports, Waterways and Offshore Facilities
Military and Defense Systems
1036 Cape St. Claire Center, Annapolis, Md. 21401
(301) 757-3245

DESIGNERS & PLANNERS, INC.
NAVAL ARCHITECTS MARINE ENGINEERS

CRYSTAL PARK #1, SUITE 500
2011 CRYSTAL DRIVE
ARLINGTON, VA 22202
(703) 892-8200
TWX 710-955-1132

1941 OLD CUTHBERT ROAD
SUITE 106
CHERRY HILL, NJ 08034
(609) 795-1170

190 TOWNE STREET
NORWICH, CT 06360
(203) 887-2501

797 BROADWAY
BAYONNE, NJ 07002
(201) 339-9446

ENSCO

MANAGEMENT & ENGINEERING CONSULTANT SERVICES

Marine Structures • Engineering Analysis • Marine Survey
Project Management • Loss Prevention • Naval Architecture

P.O. Box 7760 • Beaumont, Texas 77706
(409) 866-9158

Envisions
ENGINEERING VISIONS, INC.
Formerly PRC Guralnick and PRC Marine Services
Naval Architects & Marine Engineers
1111 Bay Boulevard (619) 575-3300
Chula Vista, CA 92011

BARGES - TUGS - TOWING
CHARTERS AND SALES
PROCUREMENT AGENTS
ON INLAND
AND OCEAN TOWING

Jack Faulkner, Inc. ESTABLISHED 1954

Cable Address: FAULKBOAT
OFF. (504) 838-9675
(312) 798-2419

1001 W. HARIMAR COURT, METAIRIE, LA 70003
2419 Caddy Lane Flossmoor, Illinois 60422
"TOWING ANYWHERE THERE IS WATER"

CHRISTOPHER J. FOSTER, INC.
WORLD-WIDE EXPERIENCE AS DESIGNERS OF
GRAVING DOCKS • MARINE STRUCTURES
SHIPYARDS • MODERNIZATION • PORT FACILITIES
OFFSHORE TERMINALS • FLOATING DRYDOCKS
MARINE ENGINEERS • NAVAL ARCHITECTS
CONSULTING ENGINEERS
PORT WASHINGTON NEW YORK 11050
(516) 883-2830 TELEX 14-4674 CABLE: "CEFOSTA"

GIBBS & COX INC
NAVAL ARCHITECTS & MARINE ENGINEERS
119 West 31st Street • New York, N.Y. 10001
(212) 613-1300

Naval Architects
Marine Engineers
Ocean Engineers

Seattle, WA
206-624-7850
Telex 32-1226

THE GLOSTEN ASSOCIATES, inc.

Phillip Gresser Associates Ltd.

MARINE ENGINEERS
CONSULTANTS & SURVEYORS

3250 SOUTH OCEAN BLVD.
PALM BEACH FLORIDA 33480 TEL: (305) 586-0813

MORRIS QURALNICK ASSOCIATES, INC.
NAVAL ARCHITECTS MARINE ENGINEERS

MAIN OFFICE:
620 FOLSOM STREET, SUITE 300
SAN FRANCISCO, CA 94107
(415) 543-8650

EAST COAST OFFICE:
1911 JEFFERSON DAVIS HIGHWAY
SUITE 902 ARLINGTON, VA 22202
(703) 892-1700

J. J. HENRY CO. INC.
naval architects • marine engineers • marine consultants
40 EXCHANGE PLACE
NEW YORK, N.Y. 10005
TEL. (212) 635-4000
TWX 710-581-2021, TELEX 422-036

Cohasset, Mass (617) 383-9200
Moorestown, N.J (609) 234-3880
Sturgeon Bay, Wis (414) 743-8217

Blount Marine Delivers 64-Foot Ferry To Prudence Island Navigation

The Detroit Diesel-powered Prudence Ferry replaced the Prudence II, which was built 24 years ago by Blount Marine Corporation.

Blount Marine Corporation of Warren, R.I., has delivered the new M/V Prudence Ferry to the Prudence Island Navigation Company. The ferry took over operations of the previous vessel, the Prudence II, on March 1.

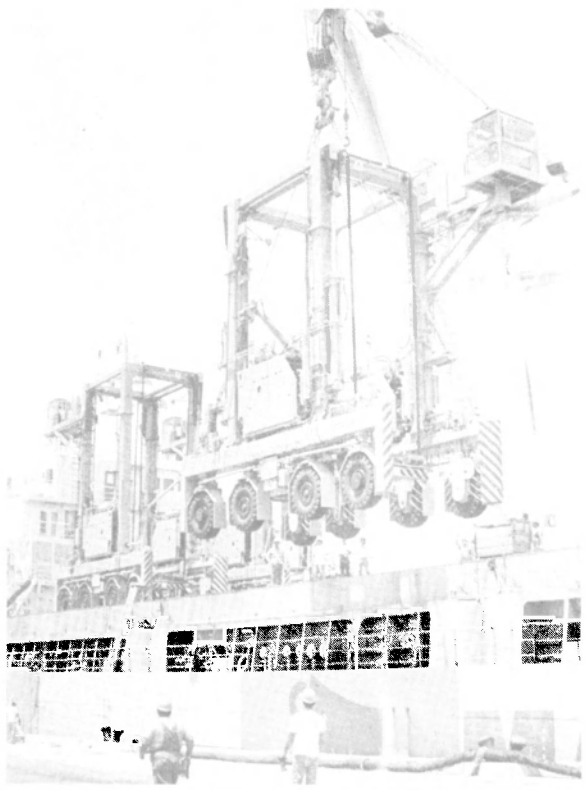
The new M/V Prudence Ferry at 64 feet by 35 feet by 4 feet, is capable of carrying up to 10 cars and 149 passengers, and is said to be considered the best ice-breaking vessel on the Narragansett Bay. She will make special trips between Bristol, R.I., and Prudence Island for rubbish pick up, fuel truck delivery, fire and emergency, highway maintenance and heavy delivery trucks. A uniquely designed bow ramp enables the Prudence Ferry to embark/disembark vehicles easily. The previous ferry, although being able to carry 225 passengers, had no freight-carrying capability and a one-car capacity.

The M/V Prudence Ferry, powered by a Detroit Diesel Allison 12V71 engine, has a 40-person-capacity passenger shelter with picture windows, sound-insulated interiors, two heated cabins and a third removable cabin. The ferry is designed to be a very "dry" vessel, keeping both passengers and cargo safe and comfortable.

For further information and free literature on the services offered by Blount Marine,

Circle 22 on Reader Service Card

Matson's Honolulu Facility Gets New Straddle Carriers —Literature Available



Five new straddle carriers, each 50 feet high and weighing 60 tons, were unloaded recently (photo) at Matson Navigation Company's Honolulu container yard as part of the Matson Terminals program to replace cargo-handling equipment in its West Coast-Hawaii service.

The five vehicles, which cost about $1.7 million, were built by Mitsubishi Heavy Industries in Mihara, Japan. The new straddlers can stack containers three high, compared with two high for previous models, and are more economical to operate and maintain. Matson has ordered five more for Honolulu and three for the Oakland, Calif., terminal, with delivery scheduled for this fall.

For further information on Matson's service and facilities,

Circle 17 on Reader Service Card

Circle 225 on Reader Service Card

Circle 245 on Reader Service Card

FOR MORE INFORMATION
ON
EQUIPMENT AND SERVICES ADVERTISED IN THIS ISSUE

CIRCLE THE APPROPRIATE NUMBER ON READER SERVICE CARD OPPOSITE →

ADVERTISER	EQUIPMENT /SERVICE	CIRCLE NO.
ACTION THREADED PRODUCTS	THREADED PRODUCTS	130
ADVANCED STRUCTURES	DOORS	245
ADVANCED STRUCTURES	PANELS	246
AEROQUIP	FLUID LINE PRODUCTS	147/148 149/150
ALDEN ELECTRONICS	WEATHER CHART RECORDERS	135
AMERICAN ABRASIVE METALS	NONSLIP DECK COATING	103
AMERICAN IDENTIFICATION PRODUCTS	LABELS	231
ATKINSON DYNAMICS	INDUSTRIAL INTERCOMS	125
BMV BERGEN	DIESEL ENGINES	110
BAILEY CONTROLS	VESSEL MONITORING/CONTROLS	170
BAILEY REFRIGERATION	AIR CONDITIONING/REFRIGERATION	111
BECLAWAT (ONTARIO) LTD	WINDOWS/DOORS	122
BELCHER OIL	BUNKERING	183
BENDER	SHIPBUILDING/REPAIR	134
CARRIER TRANSICOLD	AIR CONDITIONING/REFRIGERATION	203
CAT PUMPS	REVERSE OSMOSE PUMPS	126
CENTRICO	OIL PURIFIER	162
CHEMIQUIP PRODUCTS	SNUBBERS	128
COLT INDUSTRIES/FAIRBANKS MORSE ENGINE	DIESEL ENGINES	136
CRAWFORD	SWAGELOCK FITTINGS	127
CUMMINS	DIESEL ENGINES	120
DAHL MANUFACTURING	DIESEL FUEL FILTER/WATER SEPARATOR	262
DAITO ENGINEERING	DIESEL ENGINE PARTS	160
DEL GAVIO	MARINE HYRAULICS	155
FRED DEVINE	DIVING/SALVAGE	187
DREW AMEROID MARINE	FUEL ADDITIVES	140
DURACOTE CORP	NOISE CONTROL	271
ELLIOTT	THRUSTERS	123
ENVIROVAC	SEWAGE SYSTEMS	200/327
EXXON	MARINE LUBRICANTS	112
FERNSTRUM	GRIDCOOLERS	165
FLAKT AB	AIRCONDITIONING/REFRIGERATION	214
GENERAL THERMODYNAMICS	DIESEL ENGINE ACCESSORIES	105
GENSTAR STONE PRODUCTS	BALLAST	189
GLADDING HEARN	SHIPBUILDING REPAIR	174
GOLTENS	DIESEL PARTS/SERVICE	168
GOOD PEOPLE SEA & SHORE	SHIPBUILDING/REPAIR	206
GOODWAY TOOLS	CLEANING SYSTEM	175
GRASSO, INC.	REFRIGERATION EQUIPMENT	196
HBC	BARGE BUILDING/REPAIR	277
HARRIS/RF COMMUNICATIONS	NAVIGATION/COMMUNICATIONS	129
HAYNES CORP.	ADECO FUEL SYSTEMS/DIESEL POWER EQUIPMENT	251
HENSCHEL CORP.	SHIP CONTROL SYSTEMS	139
HIAB CRANE	CRANES	208
HOSE-McCANN TELEPHONE	COMMUNICATIONS EQUIPMENT	142
HYDRO-CRAFT	CLAMP SYSTEMS	171
HYUNDAI HEAVY INDUSTRIES	SHIPBUILDING/DESIGN/REPAIR	233
IMAC	ACCOMMODATION SYSTEM	157
ILLMAN JONES	DIESEL EQUIPMENT	163
INFRASONIK AB	BOILER CLEANING	107
INSINGER MACHINE	GALLEY EQUIPMENT	141
INTERNATIONAL MARITIME ASSOCIATES	MARKETING GUIDES	145
JMJ MARINE INVESTORS	EQUIPMENT RESALES	138
JIM'S PUMP	PUMP SERVICE/REPAIR	195
JOHNSON RUBBER	SLEEVE/FLANGES/BEARINGS	207
JUNIPER INDUSTRIES	DOORS/HATCHES/SCUTTLES	205
KAHLENBERG BROS.	ELECTRIC HORN/NAVIGATION SAFETY EQUIPMENT	179
WALTER KIDDE	FIRE PROTECTION SYSTEMS	309
KOCH ELLIS TANK BARGE	BARGE SERVICE	182
LIMA ELECTRIC	MARINE ALTERNATORS	180
LIMITORQUE	PNEUMATIC ACUATORS	263
LIPS PROPELLERS	PROPELLERS	116
McALLISTER BROS.	TOWING SERVICES	250
McCAUSEY LUMBER	LAMINATED VENEER LUMBER	253
M.A.N.-B&W	DIESEL ENGINES	181
MANITEX	CRANES	131
MARINE SAFE ELECTRONICS	ELECTRICAL EQUIPMENT	279
MARINE TRAVELIFT	BOAT/SHIP HOISTS	194
MARINETTE MARINE	SHIPBUILDING/REPAIR	146
MARKETEC	WYNN WINDOW WIPERS	286
MARKEY MACHINERY	DECK MACHINERY	192
MARKISCHES WERKE	DIESEL PARTS	177
MEGATOR CORP.	PUMPS	222
METROPOLITAN PLUMBING	VALVES/FITTINGS	320
MICHIGAN WHEEL	TOWMASTER NOZZLE/RUDDER SYSTEM	154
MITSUBISHI	OIL PURIFICATION SYSTEM	143
L.Q. MOFFITT	BEARINGS	197
MORAN SHIPPING AGENCIES	SHIPPING AGENCIES	217
MURDOCK ENGINEERING	FLEXIBLE COUPLINGS	190
NATIONAL AIROIL BURNER	PORTABLE BURNER IGNITORS	294
NATIONAL MARINE SERVICES	VESSEL SERVICE/REPAIR	156
NAVAL ELECTRONICS	ANTENNAS	225
NEWMAR	ELECTRICAL EQUIPMENT	118
NEWPORT NEWS SHIPBUILDING	SHIPBUILDING/REPAIR	166
NICHOLS BROS.	VESSEL CONSTRUCTION	254
JOHN P. NISSEN	METAL MARKERS	211
OMNITHRUSTER	BOWTHRUSTERS	242
PACER SYSTEMS	BALLAST	234
PEARLSON ENGINEERING	SHIPLIFT SYSTEMS	115
PHOENIX PRODUCTS	LIGHTING EQUIPMENT	235
RADIO HOLLAND	NAVIGATION/COMMUNICATIONS	215
RAYTHEON MARINE	NAVIGATION/COMMUNICATIONS	188
RILEY BEAIRD	MAXIM DESALINATOR	265
ROBINSON INDUSTRIES	FANS	335
SKF STEEL	COUPLINGS/BOLTS	184
SAMSUNG	SHIPBUILDING/REPAIR	185
SHIP ANALYTICS/MTRC	TRAINING CENTER	199
SIMRAD	NAVIGATION/COMMUNICATIONS	226
SMITH BERGER	STERN ROLLERS/TOW PINS	198
SPERRY CORP.	NAVIGATION/COMMUNICATIONS	248
SQUIRE COGSWELL	AIR COMPRESSORS	255
SUDERMAN & YOUNG	TOWING SERVICES	201
SUDOIMPORT	VESSEL CONSTRUCTION	210
SUNBELT ENERGY SYSTEMS	FUEL EMULSION SYSTEMS	133
SURVIVAL INTERNATIONAL	SURVIVAL SUITS	137
TAMPA SHIP	VESSEL CONSTRUCTION/REPAIR	268
TATE ANDALE	MARINE PRODUCTS	290
TELEFLEX CORP.	VALVE ACTUATOR	237
TENFJORD	STEERING GEAR	258
TEXACO	FUEL BUNKERING	350
TOUCHE ROSS/VOSPER HOVERMARINE	HOVERMARINES	230
TRACOR INSTRUMENTS	NAVIGATION/COMMUNICATIONS	293
TRANSAMERICA DELAVAL CORPORATE MARINE	ENGINEERED MARINE COMPONENTS IN EUROPE	219
	IN US/FAR EAST	220
TROY CO.	FASTENERS	285
VERSATILE PACIFIC CORP.	VESSEL CONSTRUCTION/REPAIR	240
VITA MOTIVATOR	EDUCTORS	266
VOLVO PENTA	DIESEL ENGINES	306
WASHINGTON CHAIN & SUPPLY	CHAIN	270
WATERMAN SUPPLIES	MARINE EQUIPMENT	104
ZIDELL	BARGES	305
ZIDELL	CRANES	310

BUYERS DIRECTORY

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

AIR COMPRESSORS
Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928
Squire-Cogswell Company, 3411 Commercial Ave., Northbrook, IL 60062

AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION
Bailey Refrigeration Co., Inc, 2323 Randolph Avenue, Avenel, NJ 07001
Borg-Warner Air Conditioning, P.O. Box 1592-361C, York, PA 17405
Flakt AB, Box 8862, S-40272, Gothenburg, Sweden
Mechanical Resources Inc., 210 West Side Ave., Jersey City NJ 07305
Stal Refrigeration AB, Butangsgatan 16, S 601 87 Norrkoping, Sweden
United Technologies, Carrier Transicold Division, P.O. Box 4805, Syracuse NY 13221

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

ANODES—Cathodic Protection
Engelhard Industries Division, 2655 U.S. Route 22, Union, NJ 07083
Federal Harco, P.O. Box 40310, Houston, TX 77240
Saphire Technology, Inc.; 9370 Sunset Dr., Suite A215, Miami FL 33173
Thermal Reduction Company, 1 Pavilion Avenue, Riverside, NJ 08075
Wilson, Walton International, Inc., 66 Hudson St., Hoboken, NJ 07030

BALLASTS
Genstar Stone Products Co., Executive Plaza IV Hunt Valley, MD 21031

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

BEARINGS—Rubber, Metallic, Non-Metallic
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn NY 11231
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Lucian O. Moffitt, Inc., P.O. Box 1415, Akron, OH 44309
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470
Thomson-Gordon Limited, 3225 Mainway, Burlington, Ontario, Canada L7M 1A6
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186

BOILERS
Aalborg Vaerft, P.O. Box 661, DK-9100 Aalborg DENMARK
Combustion Engineering, Inc., 1000 Prospect Hill Road, Windsor, CT 06095
Industrial Engineering & Equipment Co., 425 Hanley Industrial Ct., St. Louis, MO 63144
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928

BOILER CLEANING
Asea Stal, 50 Chestnut Ridge Rd., Montvail N.J. 07645
Infrasonik AB (an ASEA Stal Co.). S-612 20 Finspong, SWEDEN

BROKERS
Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, LA 70153
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Jack Faulkner, Inc., 1005 W. Harimaw Ct., Metairie, LA 70001
Mowbray's Tug & Barge Sales Corp., 21 West St., New York, NY 10006
Western Maritime, 701 B Street, San Diego, CA 92101

BRONZES—COMMEMORATIVE
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

BUNKERING SERVICE
Belcher Company Inc., 8700 West Flagler, P.O. Box 025500, Miami FL 33152
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
National Marine Service Inc. (Transport Div.), 1750 Brentwood Blvd., St. Louis, MO 63144

CARGO HANDLING EQUIPMENT
Hiab Cranes & Loaders, Inc., 258 Quigley Blvd., New Castle, DE 19720
MacGregor-Navire International, Box 8991, S-402 74 Goteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016

CASTINGS/FORGINGS
NKS Industria Pesada, Grupo Industrial, Reforma 404, 140 Piso, Mexico, D.F. 06600 U.S. REP.—Lexington International Trading, Inc., 551 Fifth Ave., Room 910, New York N.Y. 10017

CHOCKING COMPOUND
InterProducts, Inc., 129 King Road E, Nobleton, Ontario LOG INO Canada
InterProducts, Inc., Avon Street Business Center, P.O. Box 1848, Charlottesville, VA 22903
Philadelphia Resins Corp., 20 Commerce St., Montgomeryville, PA 18936
Wirelock, 129 King Road E, Nobleton, Ontario LOG INO Canada

CLAMPS
Inter Product, Inc., Avon Street Business Center, P.O. Box 1848, Charlottesville, VA 22903

CLOSURES—Marine
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

COMPUTERIZED INFORMATION SYSTEMS
TIMSCO, 622 Azalea Rd., Mobile, AL 36609
Veson Systems, 29 Broadway, Suite 1002, New York, NY 10006

CONDENSERS/SEPARATORS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
Wright Austin Co., 3245 Wight St., Detroit MI 48207

CONTROL SYSTEMS—Monitoring
American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
ASEA, Inc., 4 New King St., White Plains, NY 10604
Bailey Controls, 29801 Euclid Avenue, Wickliffe, OH 44092
Barringer Research, 304 Carlingview Dr., Rexdale, Ontario, Canada M9W 5G2
Cooper Energy Services, Mount Vernon, OH 43050
Ergon, Inc., P.O. Drawer 1639, Jackson, MS 39205
Indikon Corp., 26 New St., Cambridge, MA 02138
Instruments Computers & Controls Corp., 6942 Haven Creek Dr., Katy TX 77449
Leslie Co., 401 Jefferson Rd., Parsippany, NJ 07054
Pandel Instruments Inc., 2100 N. Hwy. 360, Grand Praire, TX 75050
Propulsion Systems, Inc., 21213 76 Ave., Kent, WA 98032
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Thomas Products Ltd., Flow Switch Div., 987 West St., Southington, CT 06489-1023
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062
Valmet Automation A.S., P.O. Box 130, N-3430, Spikkestad, Norway

CRANES—HOISTS—DERRICKS—WHIRLEYS
The Crosby Group, Inc., P.O. Box 3128, Tulsa OK 74101
Davit Sales, Inc., P.O. Box 232, Jefferson Valley, NY 10535
Hiab Cranes & Loaders, Inc., 258 Quigley Blvd., New Castle, DE 19720
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
J.D. Neuhaus, Hebezeuge, D5810, Witten Heven, West Germany
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202
Manitex, Inc., 2203 Timberlock Place, Suite 130, The Woodlands, TX 77380

DECK MACHINERY—Cargo Handling Equipment
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, WA 98134
McElroy Machine & Mfg. Co., Inc., Lorraine Rd., Industrial Seaway, Gulfport, MS 39501

DECKING—GRATING
Alligned Fiber Composites, Highway 52, South Chatfield, MN 55923
International Grating, 7625 Parkhurst, Houston, TX 77028

DIESEL ACCESSORIES—CYLINDER LINERS
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, MA 02360
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn NY 11231
Haynes Corporation, P.O. Box 179, Jackson, MI 49204
Illman Jones, 1111 Green Island Rd., American Canyon, CA 94589
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637

DIESEL ENGINE—Spare Parts & Repair
Alban Engine Power, Inc., 6455 Washington Blvd., Baltimore, MD 21227
Alco Power Inc., 100 Orchard St., Auburn, N.Y. 13021
BMV Bergen Diesel A.S., P.O. Box 924, N-5001 Bergen NORWAY; 2110-10 Service Rd., Kenner LA 70062
Caterpillar, Inc., Engine Division, 100 NE Adams St., Peoria IL 61629
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Cummins Engine Co., Inc., Mail Code 40642, Box 3005 Columbus, IN 47202-3005
Goltens, 160 Van Brunt Street, Brooklyn, NY 11231
Granges Repair Service GMBH, Gutenbergring, 64 D-2000 Hamburg-Norderstedt TX:0215553
Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, Federal Republic of Germany
Schoonmaker Service Parts Co., Inc., P.O. Box 757, Foot of Spring St., Sausalito, CA 94966
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647

ELECTRICAL EQUIPMENT
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Newmar, P.O. Box 1306, Newport Beach, CA 92663
Sigmaform Corporation, P.O. Box 515, Richboro, PA 18954
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

ELECTRONIC SYSTEMS
Marine Electric RPD, Inc., 666 Pacific St., Brooklyn, NY 11217 TX: 125327
Marine Safe Electronics Ltd., 37 Staffen Drive, Concord (Toronto), Ontario CANADA L4K 2X2

EMULSIFICATION SYSTEMS
Sunbelt Energy Systems, Inc., Park Square, 2105 Park Ave., Suite 14, Orange Park, FL 32073
S/S Research & Development Inc., 1050 State St., Perth Amboy, NJ 08862
Todd Marine Systems, 61 Taylor Reed Place, Stamford, CT 06906

ENGINE TEST EQUIPMENT
General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Road, Plymouth, MA 02360

EQUIPMENT—Marine
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94083
Band-It Division, Houdaille Industries, Inc., P.O. Box 16307, Denver, CO 80216
Beaver Tool Co., 1525 SE 29th St., Box 94717, Oklahoma City, OK 73143
Boston Metals Company, 233 E. Redwood St., Baltimore, MD 21202
Thomas Coudon Associates, 6655 Amberton Dr., Baltimore, MD 21227
Daito Engineering Co., Ltd., 10-23 Kawaguchi, 3-chome, Nishi-ku, Osaka JAPAN
Genstar Stone Products Co., Executive Plaza IV, Hunt Valley, MD 21031
Hossfeld Manufacturing Co., P.O. Box 557, Winona MN 55987
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, NY 10550
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302
Nicolai Joffe, P.O. Box 5362, 9171 Wilshire Blvd., Beverly Hills, CA 90210
Raytheon Service Company, 100 Roester Rd., Suite 103, Glen Burnie, MD 21061
Transamerica Delaval Inc., Corporate Marine Program, Cowles Rd., Plainville CT 06062
Waterman Supply Co., Inc., 2815 E. Anaheim Street, P.O. Box 596, Wilmington, CA 90748

EVAPORATORS
Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Atlas-Danmark Marine & Offshore, Baltorpvej 154, KD-2750 Bllerup, Copenhagen DENMARK
Meco (Mechanical Equipment Co., Inc.), 861 Carondelet Street, New Orleans, LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

FANS—VENTILATORS—BLOWERS
Joy Manufacturing Company, 338 So. Broadway, New Philadelphia, OH 44663
Jon M. Liss Associates, Inc., 411 Borel Ave., P. O. Box 5554, San Mateo, CA 94402
Robinson Industries, P.O. Box 100, Zelienople, PA 16063

FASTENERS
Action Threaded Products Inc., 7440 W. 100th Place, Bridgeview IL 60455
Erico Fastening Systems, Inc., 301 New Albany Rd, Moorestown, NJ 08057
Hardware Specialty Co., Ships Division, 48-75 36th St., Long Island City, NY 11101
Troy Company, 315 Fairfield Rd, Fairfield, NJ 07006

FENDERING SYSTEMS—Dock & Vessel
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook VA 22624

FILTERS
Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928
Parker Filter Division, 16810 Fulton County Rd., #2, Metamora, OH 43540

FINANCING—Leasing
JMJ Marine Investors Corp., 1525 River Oaks Rd East, Marahan LA 70123

FIRE PROTECTION, DETECTION & ALARM SYSTEMS
Formica Corp., One Cyanamid Plaza, Wayne NJ 07470
Walter Kidde, Walter Kidde Dr., Wake Forest, NC 27586

FUEL OIL/LUBE OIL—Analysis & Testing
Ferrous Corporation, 910-108th N.E., P.O. Box 1764, Bellevue, WA 98009
McTigue Industries Inc., 1615 9th Ave., Bohemia, NY 11716
Ocean Fleet Services, 1301 Metropolitan Ave., Thorofare, NJ 08086

FURNITURE
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
Comfort-Mate, Inc., 7988 NW 56th Street, Miami, FL 33166

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

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

GAUGES
Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062

HATCH & DECK COVERS—Chain Pipe
MacGregor-Navire Internatinal, Box 8991, S-402 74 Goteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

HEAT EXCHANGERS
Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Industrial Engineering & Equipment Co., 425 Hanley Industrial Ct., St. Louis, MO 63144
Meco (Mechanical Equipment Co., Inc.), 861 Carondelet Street, New Orleans, LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
Vapor Corp., 6420 West Howard St., Chicago IL 60648

HORNS/WHISTLES
Kahlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241

HULL CLEANING
Petroferm Marine, Route 2, Box 280, Amelia Island, FL 32034
Phosmarine Equipment, 21 Bd. de Paris, 13002, Marseille, France
Seaward Marine Service, Inc., 201 N. Union Street, Alexandria, VA 22314
Seaward Marine Service, Inc. 5409 Beamon Rd., Norfolk, VA 23513 TX: 710-881-1182
Seaward Marine Service, Inc. 424 West 8th Street, National City, CA 92050
Taylor Diving & Salvage Co. Inc., 701 Engineers Rd., Belle Chasse, LA 70037

HYDRAULICS
Aeroquip Corp., 1130 Maynard Road, Jackson, MI 49202
Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA. 93116
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Del Gavio Marine Hydraulics Inc., 207 W. Central Ave., Maywood, NJ 07607
Hydra-Dynamics, Inc., 2141 Greenwood Ave., Wilmette, IL 60091
Parker Hannifin Corporation, 17325 Euclid Avenue, Cleveland, OH 44112
Titeflex Corporation, P.O. Box 54, Springfield, MA 01109
Washington Chain & Supply, Inc., P.O. Box 3646, Seattle, WA 98124

INERT GAS
Saab Tank Control, One Harmon Plaza, Secaucus NJ 07094

INSULATION—Cloth, Fiberglass
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
Duracote Corp., 350 North Diamond St., Ravenna, Ohio 44266
Superior Energies, Inc. P.O. Drawer 386, Groves, TX 72619

INSURANCE
Adams & Porter, 510 Bering Dr., Houston, TX 77057-1408
Adams & Porter, 1 World Trade Center, Suite 8433, New York, NY 10048
Wm. Keith Hargrove, Inc., 1300 Post Oak Blvd., Suite 2050, Houston, TX 77056

JOINER—Watertight Doors—Paneling
Advanced Structures Corp., 235 W. Industry Ct., Deer Park, NY 11729
Astech, 3030 S. Red Hill Ave., Santa Ana, CA 92711
Bailey Distributors, Inc., 2323 Randolph Avenue, Avenel, NJ 07001
Masonite Commercial Division, Dover, OH 44622
Walz & Krenzer Inc., 725 Glen Cove Ave., P.O. Box 6, Glen Head NY 11545

KEEL COOLERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
Carlisle & Finch, 4562 W. Mitchell Avenue, Cincinnati, OH 45232
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Perko Inc., P.O. Box 6400D, Miami, FL 33164
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209

LINE BLINDS
American Piping Products Inc., Box 1056, New Hyde Park, NY 11040
Stacey/Fetterolf Corp., P.O. Box 103, Skippack, PA 19474

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL-MARINE
Jered Brown Brothers Inc., 1300 Coolidge, P.O. Box 2006, Troy, MI 48007
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080
Goltens, 160 Van Brunt St., Brooklyn, NY 11231

METAL MARKER
J. P. Nissen Company, P.O. Box 188, Glenside PA 19038

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

NAME PLATES—BRONZE—ALUMINUM
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Hydromath Inc., Box 2450, Danby-Pawlet Road, Pawlet, VT 05761
American Systems Engineering Corp., P.O. Box 8988, Virginia Beach, VA 23452
Ameritech Corporation, 7 Belver Avenue, Suite 215, N. Kingston, RI 02852
Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, MD 20015
Art Anderson Associates, 148 First St., Bremerton, WA 98310
B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C. Canada V6S 2L2
Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
C.D.I. Marine Co., 5520 Los Santos Way, Suite 600, Jacksonville, FL 32211

C.T. Marine, 18 Church Street, Georgetown, CT 06829
Century Engineering, inc., 32 West Rd., Towson, MD 21204
Childs Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, MA 02026
C.R. Cushing, 18 Vesey St., New York, NY 10007
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, Inc., 1725 Jefferson Davis Highway, Suite 700, Arlington, VA 22202
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
Engineering Visions, 1111 Bay Blvd., Chula Vista CA 92011
Capt. R.J. Fearson & Associates, P.O. Box 983, Tampa, FL 33601
Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, NY 11050
Gibbs & Cox, Inc., 119 West 31st Street, New York, NY 10001
John W. Gilbert Associates, Inc., 66 Long Wharf, Boston, MA 02110
The Glosten Associates, Inc., 610 Colman Bldg., 811 First Ave., Seattle, WA 98104
Phillip Gresser Associates, Ltd., 3250 South Ocean Blvd., Palm Beach, FL

OIL/WATER SEPARATORS
Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
FAST Systems, Inc., 1717 Sublette, St. Louis, MO 63110
Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928
Mitsubishi International Corp., Machinery Div., 520 Madison Ave., New York, NY 10022
NALCO Chemical, Co., 2901 Butterfield Road, Oak Brook, IL 60521
Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062
Peck Purifier Sales Co., 3724 Cook Blvd., Chesapeake, VA 23323
Sigma Treatment System, Merry Meadows RD 1 Box 70, Chester Springs, Pa 19425

PAINTS—COATINGS—CORROSION CONTROL
American Abrasive Metals Co., 460 Coit St., Irvington NJ 07111
Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754
Devoe Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207
Esgard, Box 2698, Lafayette, LA 70502
Farboil Company, 8200 Fischer Rd., Baltimore, MD 21222
Hempel Marine Paints, Inc., Foot of Currie Ave., Wallington, NJ 07057; 6868
Vita Motivator Company, 200 West 20th St., New York, NY 10011
Warren Pumps Division, Bridges Avenue, Warren, MA 01083
Wilden Pump & Engineering Co., 22060 Van Buren St., P.O. Box 845, Colton, CA 92324

REFRIGERATION—Refrigerant Valves
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
Grasso, Inc., 1101 N. Governor Street, P.O. Box 4799, Evansville, IN 47711-0799
United Technologies, Carrier Transicold Division, P.O. Box 4805, Syracuse, NY 13221

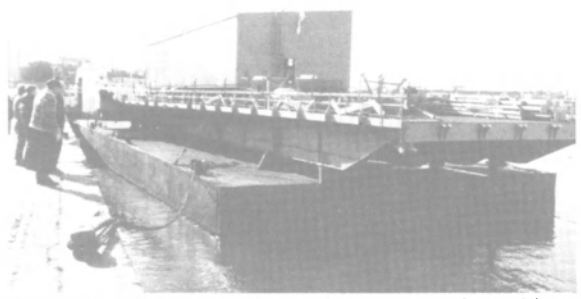
ROPE—Manila—Nylon—Hawsers—Fibers
A.L. Don Co., Foot of Dock St., Matawan, NJ 07747
Allied Fibers, 1411 Broadway, New York, NY 10018
Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008
Tubbs Cordage Company, P.O. Box 709, Orange, CA 92666
Tubbs Cordage Co., P.O. Box 7986, San Francisco, CA 94120-7986
Vermeire N.V. Industripark Zwaarveld, B-9160 Hamme, Belgium TX: 21687

SANITATION DEVICES—Pollution Control
Davit Sales Inc., P.O. Box 232, Jefferson Valley, NY 10535
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
FAST Systems Inc., 1717 Sublette, St. Louis, MO 63110

CLASSIFIED AND EMPLOYMENT ADVERTISING

HOW TO PLACE CLASSIFIED ADVERTISING: Mail clearly written or typed copy to: MARITIME REPORTER, 118 East 25th Street, New York, NY 10010. Include any photos, drawings or logos if required. Specify size of ad and number of insertions . . . Classified Advertising — Per Issue Rate: Classified advertising is sold at a rate of $70 per column inch . . . MARITIME REPORTER'S classified section carries more advertising and sells more products than any other publication in the marine industry. Closing date for classified advertising is 20 days prior to the date of the issue. For further details contact John C. O'Malley at (212) 477-6700. Send all advertising material to MARITIME REPORTER And Engineering News, 118 East 25th Street, New York, NY 10010.

MacGregor-Navire Link Span Installed At Port Of Plymouth —Literature Available



A complete link span with bridge ramp and machinery housing berthed, and ready for unloading and assembly.

The installation of a new MacGregor-Navire (MGN) RO/RO link span delivered recently by the Boelwerf yard in Belgium, has primed the ambitious U.K. port of Plymouth for further growth in commercial and tourist traffic.

Potential is seen particularly for increased trade through established services to Spain and France. Brittany Ferries is a major customer of the U.K.'s most westerly RO/RO port, which is operated by Associated British Ports. The attraction of more cruise shipping is another aim of the new terminal. Associated shoreside support facilities have been expanded substantially to cope with the doubled volume of cars, freight vehicles, and passengers.

This installation of another MGN link span follows a trend established by many port operaters worldwide—most recently at Bombay, India; Dartford, England; Oslo, Norway; and Rotterdam and Zeebrugge, Netherlands—seeking cost-effective, quick solutions for traffic expansion.

The new link span is sited at Plymouth's West

BUYERS DIRECTORY

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

AIR COMPRESSORS
Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928
Squire-Cogswell Company, 3411 Commercial Ave., Northbrook, IL 60062

AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION
Bailey Refrigeration Co., Inc, 2323 Randolph Avenue, Avenel, NJ 07001
Borg-Warner Air Conditioning, P.O. Box 1592-361C, York, PA 17405
Flakt AB, Box 8862, S-40272, Gothenburg, Sweden
Mechanical Resources Inc., 210 West Side Ave., Jersey City NJ 07305
Stal Refrigeration AB, Butangsgatan 16, S 601 87 Norrkoping, Sweden
United Technologies, Carrier Transicold Division, P.O. Box 4805, Syracuse NY 13221

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

ANODES—Cathodic Protection
Engelhard Industries Division, 2655 U.S. Route 22, Union, NJ 07083
Federal Harco, P.O. Box 40310, Houston, TX 77240
Saphire Technology, Inc.; 9370 Sunset Dr., Suite A215, Miami FL 33173
Thermal Reduction Company, 1 Pavilion Avenue, Riverside, NJ 08075
Wilson, Walton International, Inc., 66 Hudson St., Hoboken, NJ 07030

BALLASTS
Genstar Stone Products Co., Executive Plaza IV Hunt Valley, MD 21031

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

BEARINGS—Rubber, Metallic, Non-Metallic
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn NY 11231
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, OH 44309
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470
Thomson-Gordon Limited, 3225 Mainway, Burlington, Ontario, Canada L7M 1A6
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186

BOILERS
Aalborg Vaerft, P.O. Box 661, DK-9100 Aalborg DENMARK
Combustion Engineering, Inc., 1000 Prospect Hill Road, Windsor, CT 06095
Industrial Engineering & Equipment Co., 425 Hanley Industrial Ct., St. Louis, MO 63144
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928

BOILER CLEANING
Asea Stal, 50 Chestnut Ridge Rd., Montvail N.J. 07645
Infrasonik AB (an ASEA Stal Co.). S-612 20 Finspong, SWEDEN

BROKERS
Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, LA 70153
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Jack Faulkner, Inc., 1005 W. Harimaw Ct., Metairie, LA 70001
Mowbray's Tug & Barge Sales Corp., 21 West St., New York, NY 10006
Western Maritime, 701 B Street, San Diego, CA 92101

BRONZES—COMMEMORATIVE
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

BUNKERING SERVICE
Belcher Company Inc., 8700 West Flagler, P.O. Box 025500, Miami FL 33152
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
National Marine Service Inc. (Transport Div.), 1750 Brentwood Blvd., St. Louis, MO 63144

CARGO HANDLING EQUIPMENT
Hiab Cranes & Loaders, Inc., 258 Quigley Blvd., New Castle, DE 19720
MacGregor-Navire International, Box 8991, S-402 74 Goteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016

CASTINGS/FORGINGS
NKS Industria Pesada, Grupo Industrial, Reforma 404, 140 Piso, Mexico, D.F. 06600 U.S. REP.—Lexington International Trading, Inc., 551 Fifth Ave., Room 910, New York N.Y. 10017

CHOCKING COMPOUND
InterProducts, Inc., 129 King Road E, Nobleton, Ontario LOG INO Canada
InterProducts, Inc., Avon Street Business Center, P.O. Box 1848, Charlottesville, VA 22903
Philadelphia Resins Corp., 20 Commerce St., Montgomeryville, PA 18936
Wirelock, 129 King Road E, Nobleton, Ontario LOG INO Canada

CLAMPS
Inter Product, Inc., Avon Street Business Center, P.O. Box 1848, Charlottesville, VA 22903

CLOSURES—Marine
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

COMPUTERIZED INFORMATION SYSTEMS
TIMSCO, 622 Azalea Rd., Mobile, AL 36609
Veson Systems, 29 Broadway, Suite 1002, New York, NY 10006

CONDENSERS/SEPARATORS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
Wright Austin Co., 3245 Wight St., Detroit MI 48207

CONTROL SYSTEMS—Monitoring
American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
ASEA, Inc., 4 New King St., White Plains, NY 10604
Bailey Controls, 29801 Euclid Avenue, Wickliffe, OH 44092
Barringer Research, 304 Carlingview Dr., Rexdale, Ontario, Canada M9W 5G2
Cooper Energy Services, Mount Vernon, OH 43050
Ergon, Inc., P.O. Drawer 1639, Jackson, MS 39205
Indikon Corp., 26 New St., Cambridge, MA 02138
Instruments Computers & Controls Corp., 6942 Haven Creek Dr., Katy TX 77449
Leslie Co., 401 Jefferson Rd., Parsippany, NJ 07054
Pandel Instruments Inc., 2100 N. Hwy. 360, Grand Praire, TX 75050
Propulsion Systems, Inc., 21213 76 Ave., Kent, WA 98032
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Thomas Products Ltd., Flow Switch Div., 987 West St., Southington, CT 06489-1023
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062
Valmet Automation A.S., P.O. Box 130, N-3430, Spikkestad, Norway

CRANES—HOISTS—DERRICKS—WHIRLEYS
The Crosby Group, Inc., P.O. Box 3128, Tulsa OK 74101
Davit Sales, Inc., P.O. Box 232, Jefferson Valley, NY 10535
Hiab Cranes & Loaders, Inc., 258 Quigley Blvd., New Castle, DE 19720
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
J.D. Neuhaus, Hebezeuge, D5810, Witten Heven, West Germany
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202
Manitex, Inc., 2203 Timberlock Place, Suite 130, The Woodlands, TX 77380

DECK MACHINERY—Cargo Handling Equipment
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, WA 98134
McElroy Machine & Mfg. Co., Inc., Lorraine Rd., Industrial Seaway, Gulfport, MS 39501

DECKING—GRATING
Alligned Fiber Composites, Highway 52, South Chatfield, MN 55923
International Grating, 7625 Parkhurst, Houston, TX 77028

DIESEL ACCESSORIES—CYLINDER LINERS
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, MA 02360
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn NY 11231
Haynes Corporation, P.O. Box 179, Jackson, MI 49204
Illman Jones, 1111 Green Island Rd., American Canyon, CA 94589
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637

DIESEL ENGINE—Spare Parts & Repair
Alban Engine Power, Inc., 6455 Washington Blvd., Baltimore, MD 21227
Alco Power Inc., 100 Orchard St., Auburn, N.Y. 13021
BMV Bergen Diesel A.S., P.O. Box 924, N-5001 Bergen NORWAY; 2110-10 Service Rd., Kenner LA 70062
Caterpillar, Inc., Engine Division, 100 NE Adams St., Peoria IL 61629
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Cummins Engine Co., Inc., Mail Code 40642, Box 3005 Columbus, IN 47202-3005
Goltens, 160 Van Brunt Street, Brooklyn, NY 11231
Granges Repair Service GMBH, Gutenbergring, 64 D-2000 Hamburg-Norderstedt TX:0215553
Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, Federal Republic of Germany
Schoonmaker Service Parts Co., Inc., P.O. Box 757, Foot of Spring St., Sausalito, CA 94966
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647

ELECTRICAL EQUIPMENT
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Newmar, P.O. Box 1306, Newport Beach, CA 92663
Sigmaform Corporation, P.O. Box 515, Richboro, PA 18954
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

ELECTRONIC SYSTEMS
Marine Electric RPD, Inc., 666 Pacific St., Brooklyn, NY 11217 TX: 125327
Marine Safe Electronics Ltd., 37 Staffen Drive, Concord (Toronto), Ontario CANADA L4K 2X2

EMULSIFICATION SYSTEMS
Sunbelt Energy Systems, Inc., Park Square, 2105 Park Ave., Suite 14, Orange Park, FL 32073
S/S Research & Development Inc., 1050 State St., Perth Amboy, NJ 08862
Todd Marine Systems, 61 Taylor Reed Place, Stamford, CT 06906

ENGINE TEST EQUIPMENT
General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Road, Plymouth, MA 02360

EQUIPMENT—Marine
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94083
Band-It Division, Houdaille Industries, Inc., P.O. Box 16307, Denver, CO 80216
Beaver Tool Co., 1525 SE 29th St., Box 94717, Oklahoma City, OK 73143
Boston Metals Company, 233 E. Redwood St., Baltimore, MD 21202
Thomas Coudon Associates, 6655 Amberton Dr., Baltimore, MD 21227
Daito Engineering Co., Ltd., 10-23 Kawaguchi, 3-chome, Nishi-ku, Osaka JAPAN
Genstar Stone Products Co., Executive Plaza IV, Hunt Valley, MD 21031
Hossfeld Manufacturing Co., P.O. Box 557, Winona MN 55987
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, NY 10550
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302
Nicolai Joffe, P.O. Box 5362, 9171 Wilshire Blvd., Beverly Hills, CA 90210
Raytheon Service Company, 100 Roester Rd., Suite 103, Glen Burnie, MD 21061
Transamerica Delaval Inc., Corporate Marine Program, Cowles Rd., Plainville CT 06062
Waterman Supply Co., Inc., 2815 E. Anaheim Street, P.O. Box 596, Wilmington, CA 90748

EVAPORATORS
Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Atlas-Danmark Marine & Offshore, Baltorpvej 154, KD-2750 Bllerup, Copenhagen DENMARK
Meco (Mechanical Equipment Co., Inc.), 861 Carondelet Street, New Orleans, LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

FANS—VENTILATORS—BLOWERS
Joy Manufacturing Company, 338 So. Broadway, New Philadelphia, OH 44663
Jon M. Liss Associates, Inc., 411 Borel Ave., P. O. Box 5554, San Mateo, CA 94402
Robinson Industries, P.O. Box 100, Zelienople, PA 16063

FASTENERS
Action Threaded Products Inc., 7440 W. 100th Place, Bridgeview IL 60455
Erico Fastening Systems, Inc., 301 New Albany Rd, Moorestown, NJ 08057
Hardware Specialty Co., Ships Division, 48-75 36th St., Long Island City, NY 11101
Troy Company, 315 Fairfield Rd, Fairfield, NJ 07006

FENDERING SYSTEMS—Dock & Vessel
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook VA 22624

FILTERS
Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928
Parker Filter Division, 16810 Fulton County Rd., #2, Metamora, OH 43540

FINANCING—Leasing
JMJ Marine Investors Corp., 1525 River Oaks Rd East, Marahan LA 70123

FIRE PROTECTION, DETECTION & ALARM SYSTEMS
Formica Corp., One Cyanamid Plaza, Wayne NJ 07470
Walter Kidde, Walter Kidde Dr., Wake Forest, NC 27586

FUEL OIL/LUBE OIL—Analysis & Testing
Ferrous Corporation, 910 108th N.E., P.O. Box 1764, Bellevue, WA 98009
McTigue Industries Inc., 1615 9th Ave., Bohemia, NY 11716
Ocean Fleet Services, 1301 Metropolitan Ave., Thorofare, NJ 08086

FURNITURE
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
Comfort-Mate, Inc., 7988 NW 56th Street, Miami, FL 33166

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

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

GAUGES
Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062

HATCH & DECK COVERS—Chain Pipe
MacGregor-Navire Internatinal, Box 8991, S-402 74 Goteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

HEAT EXCHANGERS
Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Industrial Engineering & Equipment Co., 425 Hanley Industrial Ct., St. Louis, MO 63144
Meco (Mechanical Equipment Co., Inc.), 861 Carondelet Street, New Orleans, LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
Vapor Corp., 6420 West Howard St., Chicago IL 60648

HORNS/WHISTLES
Kahlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241

HULL CLEANING
Petroferm Marine, Route 2, Box 280, Amelia Island, FL 32034
Phosmarine Equipment, 21 Bd. de Paris, 13002, Marseille, France
Seaward Marine Service, Inc., 201 N. Union Street, Alexandria, VA 22314
Seaward Marine Service, Inc. 5409 Beamon Rd., Norfolk, VA 23513 TX: 710-881-1182
Seaward Marine Service, Inc. 424 West 8th Street, National City, CA 92050
Taylor Diving & Salvage Co. Inc., 701 Engineers Rd., Belle Chasse, LA 70037

HYDRAULICS
Aeroquip Corp., 1130 Maynard Road, Jackson, MI 49202
Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA. 93116
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Del Gavio Marine Hydraulics Inc., 207 W. Central Ave., Maywood, NJ 07607
Hydra-Dynamics, Inc., 2141 Greenwood Ave., Wilmette, IL 60091
Parker Hannifin Corporation, 17325 Euclid Avenue, Cleveland, OH 44112
Titeflex Corporation, P.O. Box 54, Springfield, MA 01109
Washington Chain & Supply, Inc., P.O. Box 3646, Seattle, WA 98124

INERT GAS
Saab Tank Control, One Harmon Plaza, Secaucus NJ 07094

INSULATION—Cloth, Fiberglass
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
Duracote Corp., 350 North Diamond St., Ravenna, Ohio 44266
Superior Energies, Inc. P.O. Drawer 386, Groves, TX 72619

INSURANCE
Adams & Porter, 510 Bering Dr., Houston, TX 77057-1408
Adams & Porter, 1 World Trade Center, Suite 8433, New York, NY 10048
Wm. Keith Hargrove, Inc., 1300 Post Oak Blvd., Suite 2050, Houston, TX 77056

JOINER—Watertight Doors—Paneling
Advanced Structures Corp., 235 W. Industry Ct., Deer Park, NY 11729
Astech, 3030 S. Red Hill Ave., Santa Ana, CA 92711
Bailey Distributors, Inc., 2323 Randolph Avenue, Avenel, NJ 07001
Masonite Commercial Division, Dover, OH 44622
Walz & Krenzer Inc., 725 Glen Cove Ave., P.O. Box 6, Glen Head NY 11545

KEEL COOLERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
Carlisle & Finch, 4562 W. Mitchell Avenue, Cincinnati, OH 45232
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Perko Inc., P.O. Box 6400D, Miami, FL 33164
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209

LINE BLINDS
American Piping Products Inc., Box 1056, New Hyde Park, NY 11040
Stacey/Fetterolf Corp., P.O. Box 103, Skippack, PA 19474

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL-MARINE
Jered Brown Brothers Inc., 1300 Coolidge, P.O. Box 2006, Troy, MI 48007
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080
Goltens, 160 Van Brunt St., Brooklyn, NY 11231

METAL MARKER
J. P. Nissen Company, P.O. Box 188, Glenside PA 19038

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

NAME PLATES—BRONZE—ALUMINUM
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Hydromath Inc., Box 2450, Danby-Pawlet Road, Pawlet, VT 05761
American Systems Engineering Corp., P.O. Box 8988, Virginia Beach, VA 23452
Ameritech Corporation, 7 Belver Avenue, Suite 215, N. Kingston, RI 02852
Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, MD 20015
Art Anderson Associates, 148 First St., Bremerton, WA 98310
B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C. Canada V6S 2L2
Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
C.D.I. Marine Co., 5520 Los Santos Way, Suite 600, Jacksonville, FL 32211

C.T. Marine, 18 Church Street, Georgetown, CT 06829
Century Engineering, inc., 32 West Rd., Towson, MD 21204
Childs Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, MA 02026
C.R. Cushing, 18 Vesey St., New York, NY 10007
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, Inc., 1725 Jefferson Davis Highway, Suite 700, Arlington, VA 22202
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
Engineering Visions, 1111 Bay Blvd., Chula Vista CA 92011
Capt. R.J. Fearson & Associates, P.O. Box 983, Tampa, FL 33601
Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, NY 11050
Gibbs & Cox, Inc., 119 West 31st Street, New York, NY 10001
John W. Gilbert Associates, Inc., 66 Long Wharf, Boston, MA 02110
The Glosten Associates, Inc., 610 Colman Bldg., 811 First Ave., Seattle, WA 98104
Phillip Gresser Associates, Ltd., 3250 South Ocean Blvd., Palm Beach, FL 33480
Morris Guralnick Associates, Inc., 620 Folsom Street, Suite 300, San Francisco, CA 94107
Hamilton Cornell Associates, Box 188, Snug Harbor Station, Duxbury, MA 02331
J.J. Henry Co., Inc., 40 Exchange Place, New York, NY 10005
Hi-Test Laboratories, Inc., P.O. Box 226, Buckingham C.H., VA 23921
HydroComp, Inc., 10 Cutts Road, P.O. Box 865, Durham, NH 03824
Intramarine, Inc., P.O. Box 53043, Jacksonville, FL 32201
JJH Inc. of Virginia, 330 County St, Portsmouth VA 23704
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Jantzen Engineering Co., 6655-H Amberton Drive, Baltimore, MD 21227
James S. Krogen, 1515 NW 7th St., Suite 124, Miami FL 33125
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
John J. McMullen Associates, Inc., 1 World Trade Center, New York, NY 10048
Fendall Marbury, 1933 Lincoln Drive, Annapolis, MD 21401
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, OH 44114
Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, NY 11746
Marine Power Associates, 1010 Turquois St., Ste 217, San Diego, CA 92109
Maritime Design, Inc., 2955 Hartley Rd., Jacksonville, FL 32217
George E. Meese, 194 Acton Rd., Annapolis, MD 21403
R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003
Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
Nickum & Spaulding Associates, Inc., 2701 First Ave., Seattle, WA 98121
Northern Marine, P.O. Box 1169, Traverse City, MI 49685
Ocean-Oil Internatinal Engineering Corporation, 3019 Mercedes Blvd., New Orleans, LA 70114
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, FL 33156
Q.E.D. Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St., San Francisco, CA 94105
Sargent & Herkes Inc., 611 Gravier St., New Orleans, LA 70130
Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, FL 33316
SEACOR Systems Engineering Corp., 520 Fellowship Rd., Ste C306, Mt. Laurel NJ 08054
STV/Sanders & Thomas, Inc., 1745 Jefferson Davis Hwy., Arlington, VA 22202
Seaworthy Systems Inc., 28 Main St., Essex CT 06426; 17 Battery Pl., New York, NY 10004; P.O. Box 205, Solomons MD 20688; 2 Skyline Pl, 5203 Leesburg Pike, Falls Church VA 22041
Seaworthy Electrical Systems, 17 Battery Pl. N.Y. N.Y. 10004
George G. Sharp, Inc., 100 Church St., New York, NY 10007
Simmons Associates, P.O. Box 760, Sarasota, FL 33578
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
Thomas Coudon Associates, 6655 Amberton Drive, Baltimore, MD 21227
Timsco, 622 Azalea Road, Mobile, AL 36609
Tracor Hydronautics, Inc., 7210 Pindell School Rd., Laurel, MD 20707
Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744

NAVIGATION & COMMUNICATIONS EQUIPMENT
AT&T Communications, 412 Mt Kemble Ave., Room N420, Morristown, NJ 07960
Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080
COMSAT World Systems, 950 L'Enfant Plaza, S.W., Suite 6151 Washington, DC 20024
A/S Elektrisk Bureau, P.O. Box 98, N-1360 Nesbru, Norway
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
General Electric Company, Mobile Communications Division, Lynchburg, VA 24502
Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610
Henschel, 9 Hoyt Drive, Newburyport, MA 01950
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
ITT Mackay, 441 U.S. Highway #1, Elizabeth, NJ 07202
Kongsberg Vopenfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway
Micrologic, 20801 Dearborn, Chatsworth, CA 91311
Naval Electronics, 5479 Jetport Industrial Blvd., Tampa FL 33614
Nav-Com, Inc., 9 Brandywine Drive, Deer Park, NY 11729
Navigation Sciences Inc., 6900 Wisconsin Ave., Bethesda, MD 20815 TX: 705999
Perko Inc. (Lights), P.O. Box 6400D, Miami, FL 33164
Racal Marine Inc., 1 Commerce Blvd., Palm Coast, FL 32037-0029
Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033
Raytheon Marine Co., 676 Island Pond Road, Manchester, NH 03103
Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061
Robertson-Shipmate, 400 Oser Ave., Hauppauge NY 11788
S.P. Radio A/S, DK 9200 Aalborg, Denmark
SAIT Inc., 33 Rector St., New York, NY 10006
Simrad, 2208 NW Market St., Seattle WA 98107
Sperry Corporation, Rte 29 North, Charlottesville, VA 22906
Telesystems, 2700 Prosperity Ave., Fairfax, VA 22031 USA
Tracor Instruments Austin Inc., 6500 Tracor Lane, Austin, TX 78725

OILS—Marine—Additives
B P North America Petroleum, 555 US Route 1, So. Iselin, NJ 08830
Exxon Company, U.S.A., Room 2323 AH, P.O. Box 2180, Houston, TX 77701
Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001
Gulf Oil, New York District Sales Office (Domestic), 433 Hackensack Avenue, Hackensack, NJ 07601
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
Mobil Oil Corp., 150 East 42 Street, New York, NY 10017
Texaco, Inc. (International Marine), 135 East 42nd St., New York, NY 10017

OIL/WATER SEPARATORS
Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
FAST Systems, Inc., 1717 Sublette, St. Louis, MO 63110
Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928
Mitsubishi International Corp., Machinery Div., 520 Madison Ave., New York, NY 10022
NALCO Chemical, Co., 2901 Butterfield Road, Oak Brook, IL 60521
Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062
Peck Purifier Sales Co., 3724 Cook Blvd., Chesapeake, VA 23323
Sigma Treatment System, Merry Meadows RD 1 Box 70, Chester Springs, Pa 19425

PAINTS—COATINGS—CORROSION CONTROL
American Abrasive Metals Co., 460 Coit St., Irvington NJ 07111
Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754
Devoe Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207
Esgard, Box 2698, Lafayette, LA 70502
Farboil Company, 8200 Fischer Rd., Baltimore, MD 21222
Hempel Marine Paints, Inc., Foot of Currie Ave., Wallington, NJ 07057; 6868 NorthLoop East, Suite 304, Houston, TX 77028; P.O. Box 10265, New Orleans, LA 70181
International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083
Jotun Marine Coatings Inc., 175 Penrod Court N&O, Glen Burnie, MD 21061
Magnus Maritec International Inc., 150 Roosevelt Pl., P.O. Box 150, Palisades Park, NJ 07650
Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203

PIPE-HOSE—Cargo Transfer Clamps, Couplings, Coatings
Amermarine International, P.O. Box 9205, Dundalk, MD 21222
Ameron Fiberglass Pipe Division, P.O. Box 801148, Houston TX 77280
Deutsch Metal Components, 14800 S. Figueroa St., Gardena, CA 90248
Hydro-Craft Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063
Knights Piping Inc., 5309 Industrial Road, Pascagoula, MS 39567
Murdock Engineering, P.O. Box 152278, Irving, TX 75015
Tioga Pipe Supply Co. Inc., 2450 Wheatsheaf La., P.O. Box 5997, Philadelphia, PA 19137
Willcox, P.O. Box 484, Garfield NJ 07026

PLASTICS—Marine Applications
Hubeva Marine Plastic, Inc., 390 Hamilton Ave., Brooklyn, NY 11231

PNEUMATICS
Limitorque Corporation, 5114 Woodall Rd., Lynchburg, VA 24506

PROPELLER POLISHING
Aquafacs Marine Technical Services, Pier One, Berth One, Boston MA 02128
Pacific Marine Services, P.O. Box 3400, Terminal Island, CA 90731

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
Allison Gas Turbine Division, General Motors Corp., P.O. Box 420 Speed code U6, Indianapolis, IN 46206
Amarillo Gear Co., P.O. Box 1789, Amarillo, Texas 79105
Armco Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
BMV Bergen Diesel A.S., P.O. Box 924, N-5001 Bergen NORWAY; 2110-10 Service Rd., Kenner LA 70062
Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Caterpillar, Inc., Engine Division, 100 NE Adams St., 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, CT 06095
Coolidge Propeller, 1608 Fairview Ave. East, Seattle, WA 98102; 3717 Industrial Rd., Pascagoula, MS 39567
Coolidge-Stone Vickers, Inc., 56 Squirrel Rd., Auburn Hills, MI 48057
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505
General Motors, Electro-Motive Division, LaGrange, IL 60525
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231
KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada
Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323
M.A.N.-B&W Diesel, 2 Ostervej, DK-4960 Holeby, Denmark
MTU of North America, 10450 Corporate Dr., Sugarland, TX 77478
MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
Mitsubishi International Corporation, Mita Kokusai Bldg. 4-28 Mita 1-chome, Minato-ku Tokyo 108 Japan
National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA 70037
North American Marine Jet P.O Box 1232 Benton, AR 72015
Omnithruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
Penske GM Power, Inc., 600 Parsippany Road, Parsippany, NJ 07054
Inland Water Propulsion Systems, Inc., 580 Walnut St., Cincinnati, OH 45201
Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032
SKF Steel, Couplings Div., 22 Waterville Rd., P.O. Box 745, Avon, CT 06001
Schottel of America, Inc., 8375 N.W. 56 St., Miami, FL 33166
Skinner Engine, Co., P.O. Box 1149, Erie PA 16512
Stewart & Stevenson Services, Inc., P.O. Box 1637, Houston, TX 77251-1637
Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland
Tech Development Inc., 6800 Poe Ave., P.O. Box 14557, Dayton, OH 45414
Tenfjord Inc., 200 Jackson Ave., Hoboken, NJ 07030
Ulstein Maritime Ltd., 6307 Laurel St., Burnaby, B.C. Canada V5B 3B3
Ulstein Trading Ltd. A/S, N-6-65, Ulsteinvik, Norway
J.M. Voith GmbH Dept. WErung, Postfach 1940 7920 Heidenheim/Brenz, West Germany
Voith Schneider America, 159 Great Neck Rd., Ste. 200, Great Neck, NY 11021
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072

PUMPS—Repairs—Drives
Allweiler Pump Inc., 5410 Newport Dr., Rolling Meadows, IL 60008 TX: 270-0444
Cat Pumps Corp., 1681 94th Lane NE, Minneapolis MN 55434
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL-MARINE
FMC Coffin Turbo Pump, 326 S Dean St., Englewood NJ 07631
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND
Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101
Meco (Mechanical Equipment Co., Inc.), 861 Carondelet Street, New Orleans, LA 70130
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
Transamerica Delaval, Pyramid Pump Div., P.O. Box 447, Monroe, NC 28110
Vita Motivator Company, 200 West 20th St., New York, NY 10011
Warren Pumps Division, Bridges Avenue, Warren, MA 01083
Wilden Pump & Engineering Co., 22060 Van Buren St., P.O. Box 845, Colton, CA 92324

REFRIGERATION—Refrigerant Valves
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
Grasso, Inc., 1101 N. Governor Street, P.O. Box 4799, Evansville, IN 47711-0799
United Technologies, Carrier Transicold Division, P.O. Box 4805, Syracuse, NY 13221

ROPE—Manila—Nylon—Hawsers—Fibers
A.L. Don Co., Foot of Dock St., Matawan, NJ 07747
Allied Fibers, 1411 Broadway, New York, NY 10018
Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008
Tubbs Cordage Company, P.O. Box 709, Orange, CA 92666
Tubbs Cordage Co., P.O. Box 7986, San Francisco, CA 94120-7986
Vermeire N.V. Industripark Zwaarveld, B-9160 Hamme, Belgium TX: 21687

SANITATION DEVICES—Pollution Control
Davit Sales Inc., P.O. Box 232, Jefferson Valley, NY 10535
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
FAST Systems Inc., 1717 Sublette, St. Louis, MO 63110
Golar Metal A/S, P.O. Box 70, 4901 Tvedestrand, Norwcy
Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND

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

SCUTTLES/MANHOLES
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

SHAFT SEALS, MECHANICAL PACKING
EG&G Sealol Engineered Prod. Div. Marine Products Group, Warwick, RI 02888
Garlock Inc., Mechanical Packing Div., 1666 Division St., Palmyra, NY 14522

SHIPBREAKING—Salvage
Fred Devine Diving & Salvage, Inc., 6211 N. Ensign, Swan Island, Portland, OR 97217
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

SHIPBUILDING EQUIPMENT
Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA 93116
M.A.N.—GHH, Sterkrade Werfsrabe 112 D-4100 Duisburg 18, West Germany
MAN—GHH, P.O. Box 110240, D-4200 Oberhausen 11, West Germany
Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, FL 33156
Total Transportation System Inc., 813 Forest Dr., Newport News, VA 23606
Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 248, N 5201, Os, Norway

SHIPBUILDING STEEL
Armco Steel Corp., 703 Curtis St., Middletown, OH 45042
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
High Strength QA Steel, P.O. Box 40606, Houston, Tx 77240-0606
Welded Beam Company, P.O. Box 280, Perry, OH 44081

SHIPBUILDING—Repairs, Maintenance, Drydocking
Arsenale Triestino-San Marco Shipyard, Trieste, Italy, U.S. Rep: Marine Technologies & Brokerage, 33 Rector St., New York, NY 10066
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA 93116
Bath Iron Works Corp., 700 Washington St., Bath, ME 04530
Bay Shipbuilding Corp., 605 N. 3rd Ave., Sturgeon Bay, WI 54235
Bender Shipbuilding & Repair Co., Inc., P.O. Box 42, Mobile, AL 36601
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
Blohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1 (In US)-Blohm & Voss CO, Springfield, N.J.
Blount Marine Corp., P.O. Box 368, Warren, RI 02885
Boston Whaler Commercial Div., 1149 Hingham St., Rockland MA 02370
Brodosplit, Put Udarniku 19, P.O. Box 107, 58000 Split YUGOSLAVIA
Burrard Yarrows Corporation, P.O. Box 86099, North Vancouver, B.C., Canada
Chesapeake Shipbuilding Inc., 710 Fitzwater St., Salisbury, MD 21801
Cityvarvet AB, Lindholmen, P.O. Box 2753, S-402 76 Goteborg SWEDEN
Conrad Industries, P.O. Box 790, Morgan City, LA 70380
Coast Iron & Machine Works, 5225-7th Street E., Tacoma, WA 98424
Curacao Drydock (U.S.A.) Inc., 26 Broadway, Suite 741, New York, NY 10004
Eastern Marine, Inc., P.O. Box 1009, Panama City, FL 32401
Fincantieri SpA Cantieri Navali Italiani, Via Cipro 11, 16129 Genoa ITALY
Gladding-Hearn Shipbuilding, Box D (1 Riverside Ave.), Somerset MA 02726
Good People Sea And Shore Services Inc., 255 Commercial St., North Sydney, Cape Breton Island, NS CANADA B2A 3M3
HBC Barge Co. Brownsville, PA 15417
Hitachi Zosen Corp., 1-1-1 Hitotsubashi, Chiyoda-ku, Tokyo 100, Japan
Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong
Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, KOREA
Industrial Marine Engineering Ltd., P.O. Box 172, Suva, Fiji
Jeffboat Inc., Jeffersonville, Ind. 47130
Jered Brown Brothers, Inc., 56 S. Squirrel Rd., Auburn Hills, MI 48057
Keppel Shipyard Limited, 325 Telok Blangah Road, P.O. Box 2169, Singapore 0409
Koch Ellis Barge & Ship Service, P.O. Box 9130, Westwego, LA 70094
Paul Lindenau GmbH, & Co., Schiffswerft u. Maschinenfabrik, D-2300 Kiel-Friedrichsort, West Germany
Lisnave, Apartado 2138, 1103 Lisbon, Codex PORTUGAL
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, WA 98134
M.A.N. GHH Sterkrade, P.O.B. 110240, D-4200 Oberhausen 11, West Germany
Main Iron Works, Inc., P.O. box 1918, Houma, LA 70361
Marathon LeTourneau Offshore, P.O. Box 61865, Houston, TX 77208
Marco, Inc., 2300 W Commodre Way, Seattle, WA 98199
Marinette Maine Corporation, Marinette, WI 54143
Mitsubishi Heavy Industries, Ltd., 5-1, Marunochi 2-chome, Chiyoda-ku, Toyko, 100 Japan
MonArk Boat Co., P.O. Box 210, Monticello, AR 71655
Moran Shipping Agencies, 602 Sawyer, Suite 200, Houston, TX 77077
Moss Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552
National Marine Service (Shipyard Division), P.O. Box 38, Hartford, IL 62048
National Steel & Shipbuilding Corp., San Diego, CA 92112
Nautilus Surveys Inc., 10822 Sageleaf Lane, Houston, TX 77089
Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607
Nichols Brothers Boat Builders Inc., P.O. Box 580, 5400 S. Cameron Rd., Freeland, WA 98249
Northwest Marine Ironworks, P.O. Box 3109, Portland, OR 97208
Pennsylvania Shipbuilding, P.O. Box 442, Chester, PA 19016
Port Allen Marine, P.O. Box 108, Port Allen, LA 70767
Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22
Promet Marine Services Corp., 242 Allens Ave., Providence, RI 02905
Samsung Shipbuilding & Heavy Industries Co., Ltd., Samsung Main Bldg. 250, 2Ka, Taepyong-ro, Chung-ku, Seoul, Korea
Southwest Marine, Inc., P.O. Box 13308, San Diego, CA 92113
Tampa Shipyards Inc., P.O. Box 1277, Tampa, FL 33601
3. MAJ Associated Shipbuilding Industry, P.O. Box 117, 51001 Rijeka YUGO-

First Two Of Ten Bulkers For Greek Owner Christened At Hyundai

Hyundai Heavy Industries in Ulsan, Korea, held a naming ceremony recently for the first two 41,630-dwt bulk carriers in a series of 10 vessels ordered by Efploia Shipping Company of Greece.

The two ships were christened Oinoussian Pride (photo) and Costas N. Pateras by the sponsors, Mrs. **Marigo Patitsas,** daughter, and Mrs. **Aspasia Lemos,** wife, of Capt. **Leon C. Lemos,** chairman of Efploia Shipping. The naming ceremony was attended by Captain **Lemos; D.G. Anyfantis,** technical director of Efploia, **C.L. Lee,** chairman of HHI, **S.E. Hong,** executive vice president of HHI's Shipbuilding Division, and other distinguished guests from Efploia and HHI.

The new bulkers have an overall length of 603.7 feet, beam of 100 feet, depth of 52.3 feet, and draft of 36.7 feet. Propulsion is provided by low-speed Hyundai/B&W 5L60MC diesel engines, each with maximum continuous rating of 8,820 bhp at 98 rpm and normal continuous rating of 7,938 bhp at 95 rpm. Service speed is 14 knots.

The 10 Efploia vessels, comprising five each 41,630-dwt and 63,370-dwt bulk carriers, were ordered in July 1984. Currently, all of the ships are in various states of construction at the Ulsan shipyard.

Oinoussian Pride and Costas N. Pateras are designed to carry bulk cargoes such as grain, coal, and ore in their five cargo holds; containers on deck and hatch covers; and coiled steel and unseasoned logs at the side of their upper decks.

Equipped with the latest navigation and communications instruments, these ships are classed by Lloyd's Register of Shipping +100AL, +LMC, UMS. Each ship will have a crew of 26 persons.

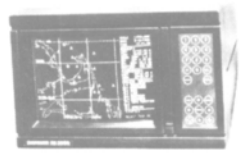
For further information on Hyundai Heavy Industries,

Circle 42 on Reader Service Card

ELECTRONICS UPDATE

The Shipmate RS-2000 Color Track Plotter

Shipmate's effort to create the total navigation system has led to the development of the RS-2000, full-featured color track plotter which, the company reports, gives virtually unlimited navigation flexibility.



The RS-2000 is not only a color track plotter, but also an electronic charting system that shows prerecorded charts for many of the most popular fishing and coastal areas. The seven-color display enables users to freely choose any colors to mark tracks, reefs, rocks, etc. This particular feature permits the user to develop his own private "color language" on the screen. It also helps to prevent navigational accidents. Charts are stored permanently on cassette tapes, allowing for easy exchange of maps and charts between users. Charts can also be drawn up before a voyage and new information can be added as needed and then stored for future use.

A built-in universal interface allows connection of just about any type of nav receiver. The RS-2000 can be used in conjunction with Shipmate's RS-5100 satellite navigator to calculate arrival times at specified fishing areas as well as being able to keep a permanent record of traveled courses. This combination is outstanding in terms of accuracy, economy and safety. It can also show up to 255 routes with unlimited waypoints per route.

This unique plotter enables the user to remember all previous voyages and keep track of the popular fishing and coastal areas, as well as being able to scale up or down or shift in any direction at the touch of a button.

For free full color literature on the Shipmate RS-2000 plotter,

Circle 26 on Reader Service Card

Goliath Shipping Buys Three Heavy-Lift Barges

Goliath Shipping (America) Inc. of Houston has acquired three submersible heavy-lift barges, the Sublift Atlantic, Sublift Pacific, and Sublift Caribic from Nedbarges Sublift B.V. of the Netherlands. They will be delivered to the new owner upon termination of their present contract, by July this year.

The barges will be renamed Goliath Atlantic, Goliath Pacific, and Goliath Caribic, and will be operated worldwide for the transportation of heavy-lift cargoes.

SLAVIA
Todd Shipyards Corporation, One Evertrust Plaza, Jersey City, NJ 07302
Tracor Marine, P.O. Box 13107, Port Everglades, FL 33316
Verreault Navigation Inc., Les Mechins, Quebec, G0J 1T0
Walker Boat Yard, P.O. Box 729, Paducah, KY 42001
Waller Marine, Inc. 11777 Katy Freeway/Suite 395, Houston, TX
Westport Shipyard, Inc., P.O. Box 308, Westport, WA 98595
Zidell Explorations, Inc., 3121 S.W. Moody Street, Portland, OR 97201

SHIPPING—PACKING
Pilotage Consultants, Inc., P.O. Box 2046, New Hyde Park, NY 11040
Signet Corporation, 1800 West Loop South, Suite 1600, Houston, TX 77027

SIMULATOR TRAINING
Marine Safety International, Marine Air Terminal, LaGuardia Airport, NY 11371
Ship Analytics/Maritime Training & Research Center, North Stonington Professional Center, N Stonington CT 06359

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

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

SURVEYORS AND CONSULTANTS
Advanced Technologies Dept. PZ-01, 7926 Jones Branch Dr., McLean, VA 22102
Frank Jeffrey & Assoc., 5201 Westbank Exp., Suite 206, Marrero, LA 70073

SURVIVAL EQUIPMENT
Fitz-Wrights Suits Ltd., 17919 Roan Pl., Surrey, B.C., Canada V3S 5K1
Harvey's Commercial Marine Division, 205 South 252 St., Kent, WA 98032
Imperial Manufacturing Co., P.O. Box 4119, Bremerton, WA 98312
Survival International, 7859 S 180th St., Kent, WA 98032

TANK CLEANING
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928
Saab Tank Control, One Harmon Plaza, Secaucus NJ 07094

TANK LEVELING INDICATORS
Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062
Saab Tank Control, One Harmon Plaza, Secaucus NJ 07094
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062

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

TOWING—Barges, Vessel Chartering, Lighterage, Salvage, etc.
Bay Houston Towing Co., 2243 Milford, P.O. Box 3006, Houston, TX 77253
Bulkfleet Marine Corporation, 1800 West Loop S., Ste 1600, Houston, TX 77027
Curtis Bay Towing, World Trade Center, Suite 800, Baltimore MD 21202
Jack Faulkner, Inc., 1005 W. Harimaw Ct., Metairie, LA 70001
McAllister Bros., Inc., 17 Battery Pl., New York, NY 10004
McDonough Marine Service, P.O. Box 26206, New Orleans, LA
Midland Affiliated Co., 580 Walnut St., Cincinnati, OH 45201
Moran Towing & Transportation, Two Greenwich Plaza, Greenwich CT 06830
National Marine Service, Transport Div., 1750 Brentwood Blvd., St. Louis, MO 63144
Port Allen Marine Service, Inc., P.O. Box 108, Port Allen, LA 70767; Walker Boat Yard, P.O. Box 729, Port Allen, LA
Suderman & Young Co., Inc., 918 World Trade Bldg., Houston, TX 77002
Turecamo Coastal & Harbor Corp. 1 Edgewater Plaza Staten Island, N.Y. 10305

VALVES AND FITTINGS
Bailey, Division of CMB Industries, P.O. Box 8070, Fresno, CA 93747
Boston Metals Company, 233 E. Redwood St., Baltimore, MD 21202
Cajon Co., 9760 Shepard Rd., Macedonia, OH 44056
Cla-Val Co., P.O. Box 1325, Newport Beach, CA 92663
Crawford Fitting Company, 29500 Solon Road, Solon, OH 44139
Elliott Manufacturing Co., Inc. (Remote Valve Operating Equipment), P.O. Box 773, Binghamton, NY 13902
Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07207
Jamesbury Corp. 640 Lincoln St., Worcester, MA 01605
Metropolitan Plumbing Supply, 5000 2nd Street, Long Island City, NY 11101
Nupro Co., 4800 E. 345th St., Willoughby, OH 44094
Parker Hydraulic Valve Division, 520 Ternes Avenue, Elyria, OH 44035
Parker Actuator Division, 9948 Rittman Road, P.O. Box 450, Wadsworth, OH 44281-0450
Parker Systems Division, 651 Robbins Drive, Box 3500, Troy, MI 48007-3500
Pittsburgh Brass Manufacturing, Sandy Hill Rd., R.D. 6 Box 387-A, Irwin, PA 15642
Stacey/Fetterolf Corporation, P.O. Box 103, Skippack, PA 19474
Stockham Valves & Fittings, Box 10326, Birmingham, AL 35202
Swagelok Company, 5171 Hudson Dr., Hudson, OH 44236
Tate Andale Inc., 1941 Landsdowne Rd., Baltimore, MD 21227
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Waukesha Bearings Corp., 405 Commerce St., P.O. Box 798, Waukesha, WI 53186
Whitey Co., 318 Bishop Road, Highland Heights, OH 44143
William E. Williams Valve Corporation, 38-52 Review Avenue, Long Island City, NY 11101
Zidell Explorations, Inc., (Valve Division), 3121 S.W. Moody Avenue, Portland, OR 97201

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

WATER PURIFIERS
Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Atlas-Danmark Marine & Offshore Baltorpej, 154 DK-2750 Ballerup, Copenhagen, Denmark, TX 35177 Atlas DK
Everpure, Inc., 660 N. Blackhawk Dr., Westmont, IL 60559
MECO (Mechanical Equipment Company, Inc.), 861 Carondelet St., New Orleans, LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

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

WELDING
Metallizing Co. of America, Inc., 321 So. Hamilton, Sullivan, IL 61951
Miller Electric Mfg. Co., P.O. Box 1079, Appleton, WI 54912

WELDING EQUIPMENT
Enerjee Ltd., 32 S. Lafayette Ave., Morrisville, PA 19067
Erico Fastening Systems, Inc., 301 New Albany Rd, Moorestown, NJ 08057

WINCHES AND FAIRLEADS
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., Lorraine Rd., Industrial Seaway, Gulfport, MS 39501
Nashville Bridge Co., P.O. Box 239 Nashville TN 37202
Smith Berger Marine Inc., 516 S. Chicago St., Seattle, WA 98108

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

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

WIRE/CABLE LUBRICATOR
Atlantis Services, Inc., 1057 Kings Ave., Jacksonville, FL 32207

WIRE AND CABLE
Atlantic Cordage Corp., 60 Grant Ave., Carteret, NJ 07008
Seacoast Electric Supply Corp., 225 Passaic St., Passaic, NJ 07055
Seacoast Electric Supply Corp., 1505 Oliver St., Houston, TX 77007

WIRE ROPE—Slings
Atlantic Cordage Corp., 60 Grant Ave., Carteret, NJ 07008
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
A.L. Don Company, Foot of Dock Street, Matawan, NJ 07747

ZINC
Thermal Reduction Company, 1 Pavilion Avenue, Riverside, NJ 08075
Smith & McCroken, 153 Franklin St., New York, NY 10013

CLASSIFIED AND EMPLOYMENT ADVERTISING

HOW TO PLACE CLASSIFIED ADVERTISING: Mail clearly written or typed copy to: MARITIME REPORTER, 118 East 25th Street, New York, NY 10010. Include any photos, drawings or logos if required. Specify size of ad and number of insertions . . . Classified Advertising — Per Issue Rate: Classified advertising is sold at a rate of $70 per column inch . . . MARITIME REPORTER'S classified section carries more advertising and sells more products than any other publication in the marine industry. Closing date for classified advertising is 20 days prior to the date of the issue. For further details contact John C, O'Malley at (212) 477-6700. Send all advertising material to MARITIME REPORTER And Engineering News, 118 East 25th Street, New York, NY 10010.

World Recognized Manufacturer of Marine Propulsion and Positioning Equipment Seeks

MARKETING MANAGER

with extensive marine propulsion equipment experience. Individual will manage and coordinate the marketing for private industry, government and military organizations survey and set up efficient marketing procedures, forecast, establish goals, marketing budget and coordinate activities with in-house sales personnel as well as establishing and coordinating an agency network in the U.S., Canada, Mexico, Central America, The Caribbean and Venezuela.

A B.S. or Master's Degree in Marketing is required. Send Resume to:

Box 602 — Maritime Reporter
118 East 25th St — New York, NY 10010

ATTENTION—DIESEL PROPULSION OPERATING ENGINEERS

Bay Shipbuilding Corp. is seeking experienced Marine Operating Engineers to work in their Quality Control Department as Test and Trials Engineers/Test and Trials Technicians. At least five years experience in the startup and operation of large shipboard diesel propulsion units required. Experience in operating low speed diesel propulsion units desirable.

If you are qualified for these positions and wish to join a progressive full-service shipyard, send resume to:

BAY SHIPBUILDING CORP.
605 North 3rd. Avenue
Sturgeon Bay, WI 54235

An Equal Opportunity/Affirmative Action Employer

MANAGEMENT OPPORTUNITIES! SHIPBUILDING—SHIP REPAIR

SHIPYARD GENERAL MANAGER
YARD GENERAL SUPERINTENDENT
VICE PRESIDENT—MARKETING
CONTROLLER
QA MANAGER
ESTIMATING MANAGER & SENIOR ESTIMATORS (SEVERAL)
WELDING ENGINEERS (TWO)
PRODUCTION SUPERINTENDENTS & FOREMEN (VARIED)

We specialize in recruiting key management personnel for the shipbuilding and ship repair industry. All fees and expenses are company paid. The above positions, and many others, are now open. Call Mr. M.A. Weeks at (205) 661-2294 as soon as possible or send resume immediately!

WEEKS AND ASSOCIATES
Management Consultants
921 Cottage Hill Avenue, Mobile Alabama 36609

EXPERIENCED OIL CARGO SURVEYORS AND TANKER EXPEDITORS REQUIRED FOR U.S. EAST COAST

An opportunity for seagoing personnel to establish themselves ashore.

A large International Oil and Cargo Inspection company is seeking experienced tanker personnel with relevant experience of C.O.W., I.G.S., and U.S.C.G. regulations.

Applications will be considered only from persons who have sailed as Chief Mate on tankers or who have a Chief Mate's License and tanker experience together with documented experience of cargo surveying.

Typically, salaries will be in range of $28,000-$32,000 per annum, together with a Company Medical Plan. Higher salaries may be negotiable for those persons with superior qualifications and proven experience in the field. Our Surveyor's reports are read by clients, Attorneys and Insurance Adjustors so good report writing skills are essential. Successful applicants may be required to travel extensively throughout the U.S. on company business.

Send resume and handwritten covering letter to

Box 601 — Maritime Reporter
118 E. 25th Street — New York, NY 10010

SALES DIRECTOR (Marine Construction) SEEKS POSITION

East Coast based Sales Director seeks position with greater challenge and faster growth.

27 years of marine experience, familiar with all aspects of marine construction and sales. Experienced with government contracts and proposal requirements. First hand experience in international business from development to completion. Excellent customer relations. Experienced in advertising and public relations.

Resume upon request.

MARITIME REPORTER
Box 116
118 East 25th Street,
New York, NY 10010

PORT ENGINEER

NEW YORK BASED STEAMSHIP COMPANY OWNERS & OPERATORS OF BULK CARRIERS AND TANKERS HAS OPENING FOR PORT ENGINEER. THIS COMPANY IS AN EQUAL OPPORTUNITY EMPLOYER. APPLICANT MUST BE LICENSED MARINE ENGINEER WITH SEA GOING EXPERIENCE ON LARGE BORE SLOW SPEED DIESEL ENGINES PREFERABLY OF SULZER OR B & W MANUFACTURE. ALL REPLIES KEPT STRICTLY CONFIDENTIAL. OUR EMPLOYEES ARE AWARE OF THIS AD. PLEASE SEND RESUME & SALARY REQUIREMENTS TO:

BOX 603
MARITIME REPORTER/ENGINEERING NEWS
118 EAST 25TH STREET
NEW YORK, N.Y. 10010

PORT ENGINEERS

American Systems Engineering Corporation has openings for experienced Port Engineers. Our Port Engineers maintain selected U.S. Navy ships in a Phased Maintenance Program.

Applicants should be degreed Marine Engineers holding USCG Engineer's License. U.S. citizenship is required.

Positions available in Honolulu, Hawaii; Long Beach, CA; Charleston, SC; Mayport, FL.

Send resume and salary requirements to:

American Systems
Engineering Corporation
Box 8988
Virginia Beach, VA 23452

Int'l Salesman/Administrator: 8 years exp. with agents/clients in Europe, Asia, S. America. Full knowledge of U.S. export regs, pricing, collections. P/L responsibility. Single, ready to travel, contact:

Box 502 — Maritime Reporter
118 East 25th Street — New York, NY 10010

World Recognized Manufacturer of Marine Propulsion and Positioning Equipment Seeks

SALES ENGINEER

with extensive marine propulsion equipment experience. Relocation necessary. Must be willing to travel within the U.S., as well as Mexico, Central America, The Caribbean and Venezuela. Experience in the marine field is an absolute must.

Send resume with expected salary to:

Box 604 — Maritime Reporter
118 East 25th St. — New York, NY 10010

ENGINEERS
POSITIONS AVAILABLE

Major supplier of marine propulsion systems is seeking qualified degreed engineers for positions in

- R & D,
- Sales,
- Application Engineering,
- Product Engineering, and
- Contract Administration.

Experience with shipyards, ship owners, marine consulting firms, and federal government agencies desired. Superior salary and benefits. Our employees are aware of this ad. Apply in complete confidence to:

Box 403, MARITIME REPORTER
118 East 25th Street, New York, NY 10010

MANUFACTURER'S REPRESENTATIVES

Territories Open Throughout U.S., Canada and Central America

Well established U.S. company internationally recognized in the field of heavy-duty marine propulsion and positioning equipment actively seeks high-performance representation to handle a comprehensive product line, including newly introduced Pump and Bow Jet propulsion and maneuvering devices.

We require an individual or organization with a solid background in the marine industry currently calling on large and small shipyards, Naval Architects, and government agencies. Our products are used in new building and retrofitting of both commercial and naval vessels.

We provide responsive logistics support and technical services, national advertising, complete sales promotional materials, and trade show participation. Please forward resume with full details to:

SCHOTTEL

Schottel of America, Inc.
8375 N.W. 56th Street
Miami, Florida 33166
Attn: Mr. P. Jacobs

PORT ENGINEER

Advanced ocean diesel license; experience with medium speed diesel engines; maritime school graduate preferred; domestic travel required; responsible for all engineering activities of 18,000 hp chemical ITBS operating USA/Russia. Full benefits including 401(K) pension plan, medical and life insurance, etc.

Send resume in confidence to:

Corporate Administrator
P.O. Box 13038
Port Everglades Station
Ft. Lauderdale, FL 33316

Sale of 22 Jumbo River Barges

The Maritime Adminstration (MARAD) is offering for sale on an "as is where is" basis, 22 jumbo river hopper barges with fiberglass covers. Terms of sale are cash only, payable at the sale closing. Acceptable bids will include the scrapping or other permanent removal from the U.S. hopper barge market of an equal number of jumbo hopper barges which are loadable for transportation service as determined by MARAD. Permanent removal includes foreign sale or permanent conversion to a non-transportation use as determined by MARAD. Those bids, including scrapping or other permanent removal in excess of the minimum, will receive additional favorable consideration. Scrapping or other permanent removal must occur within 120 days of closing. The specifications of the barges are as follows:

Barge Name	Type	Dimensions	Year Built	Builder
TCF500-503	RAKE	195x35	1979	Nashville Bridge
TCF506	RAKE	195x35	1979	Nashville Bridge
TCF508-514	RAKE	195x35	1979	Nashville Bridge
ISJ515B-524B	BOX	200x35	1981	Twin City

All barges are located at CGB Marine, LaPlace, LA, except for barges TCF512 and ISJ515B, which are located at Capital Marine, Baton Rouge, LA. Arrangements to inspect the barges must be made through MARAD. Barges are free and clear of all liens and cargo.

MARAD has not determined minimum acceptable prices. However, MARAD reserves the right to reject any and all bids. Additional favorable consideration will be given to bids for a significant number of barges. The bids will become available for public inspection after MARAD has made its selection.

Bids must be sent to the Maritime Administration, Office of Ship Financing, Room 8122, 400 7th Street, S.W., Washington, D.C. 20590, Attention: Mr. William Aird, by COB June 20, 1986. For additional information or to arrange for an inspection of the vessels, please contact Mr. Aird or Mr. Eugene Joy at (202) 382-0395.

ROOSEVELT ISLAND OPERATING CORPORATION

Ferry Service Feasibility Study

The Roosevelt Island Operating Corporation (RIOC) is interested in receiving proposals for a feasibility study for a Ferry Service to operate between Roosevelt Island and one or more points in Manhattan.

The study is expected to include a market survey, cost analysis and operating requirements i.e. schedules, equipment and docking facilities, permits required and insurance provisions. If the study results warrant, a test operation during July and August 1986 will be considered.

Organizations, having applicable operating experience and capabilities, interested in receiving a copy of the RFP should direct inquiries and qualifications statement to Roosevelt Island Operating Corporation, 591 Main Street, Roosevelt Island, New York 10044, Attn.: Raymond Loughlin, not later than June 27th, 1986. RIOC reserves the right to withdraw this offer at its discretion.

OPEN HOPPER BARGE "HAROLD SMITH"

EXCLUSIVELY IN OUR HANDS

FOR SALE

Built by Tampa Ship 1976
290'X60'X21' (uninspected)
SINGLE HOLD
42' SPOON BOW RAKE
31' STERN RAKE WITH FXD. TOW SKEGS.
DOUBLE SKIN
4'.6" COMBINGS
DIMPLE NOTCH
262,400 CO. FT. HOPPER CAPACITY
LIFTING 9056 ST. P.W. ON 19' DRAFT
DECK HOUSE
PRICE: $900,000.

CONTACT: Bill Hall
William J. Hall Assoc., Inc.
P.O. Box 2148
Vineyard Haven, MA
617-693-5116
287 794 (RCA) HALL OR

FOR LEASE PURCHASE—SALE

1—**M/V HEL-LYN** PUSHBOAT 65' x 24' 9'5" DEPTH; TWIN GM—16V-92 DIESEL; TWINDISC MG520 W6.11-1; TWIN GENERATORS 4-71 WITH 30 KW GENERATOR SET. FOUR FLANKING RUDDERS. ALL MARINE ALUMINUM CONST. CUT RUBBER BUMPER ON PERIMETER OF VESSEL. ASKING $500,000—FINANCING AVAILABLE.

M/V SHANE-T—51'7" x 22'1" x 9'0"; TWIN GM—16V-71; TWIN 3-71 DIESEL-OPR-30 KW GENERATORS; TWIN DISC—527—RESERVE GEAR WITH 5.17-1 RATIO AND HYD CLUTCH; FOUR FLANKING RUDDERS; RUBBER BUMPER SYSTEM. EXCELLENT CONDITION. ASKING $295,000-FINANCING AVAILABLE.

CALL OR WRITE **M. HUTTER,** 504/586-9191
P.O. BOX 10507, NEW ORLEANS, LA 70181

For Barge Rentals or a Complete Marine Package

Call the Barge People.

Our experience and knowledge in serving a wide variety of industries enables us to provide the right size and type of barge and tow to make your marine operations profitable.

- Large, diversified fleet for inland, oceans and speciality service
- Experience in arranging and managing marine packages
- 20 convenient fleeting locations along Gulf Coast and upper river

Rentals–Sales–Service

New Orleans
(504) 949-7586
Telex 58-4393
2300 Surekote Rd
N O , LA 70117

Houston
(713) 452-5887

Parkersburg
(304) 485-4494

St. Louis
(314) 469-0510

McDONOUGH MARINE SERVICE

FOR SALE

Ocean Marine Survey Company, Southern California; Cargo-Hull-Machinery. Annual Gross past 5 years $200,000. Owner will assist buyer for 1 year. Terms on secured collateral.

Box 501
118 East 25th Street
Maritime Reporter
New York, NY 10010

ATTN: SHIP/RIG OWNERS

Layup Facility Brunei Bay
Labuan Ship Care Services
and Agency SDN BHD
Tony Sainty MD (Formerly w/B. P. Shipcare)
Tel. (087) 411-901 TLX: 807 71 LSSA
In U S A. Call Cobro Intl., Inc.
Tel. 713-668-1801 TLX: 82819 COBRO UF

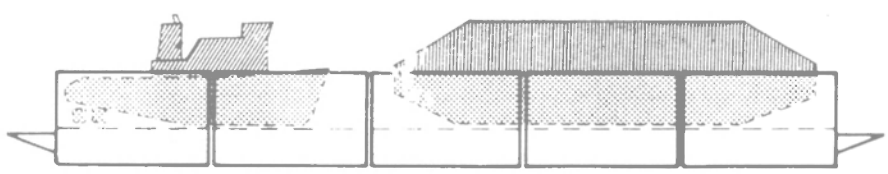
Mt. Hope & Narragansett Bays
DOCKING & COASTAL TOWING
All Diesel Fleet
PROVIDENCE STEAMBOAT COMPANY
1 India St., Providence, RI 02903
401-331-1930

T2 TANKER PARTS & EQUIPMENT FOR SALE. EXCELLENT CONDITION. ALL DECK GEAR, ENGINE ROOM, PUMPS, VALVES, STEAMBOILER, PROPELLER, SHAFT, SPARE PARTS, SUPER STRUCTURE, ETC. PHONE: AMERICAN GULF SHIPPING, INC. (504) 581-2741

DRYDOCK FOR SALE

Length over keel blocks:
458 feet (139.6 meters).

Depth over keel blocks:
28 feet (8.5 meters).



Lift capacity: 9,000 long tons
(9,144 metric tons).

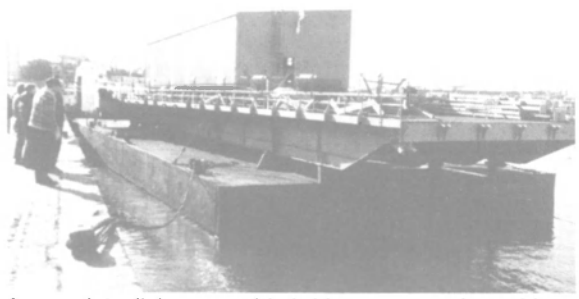
Length overall: 514 feet
(156.7 meters).

Clear width: 92.7 feet
(28.3 meters).

Sectional pontoon design enables each of its five sections to operate independently. The dock is used primarily for tugs, barges, dredges, and small- to medium-sized vessels. Recent survey, located in U.S. Price negotiable. Contact:

John C. O'Malley
Telephone: 212/477-6700 Telex: 424768 MARINTI
Box 1202, **MARITIME REPORTER**/Engineering News
118 East 25th Street, New York, NY 10010

MacGregor-Navire Link Span Installed At Port Of Plymouth —Literature Available



A complete link span with bridge ramp and machinery housing berthed, and ready for unloading and assembly.

The installation of a new MacGregor-Navire (MGN) RO/RO link span delivered recently by the Boelwerf yard in Belgium, has primed the ambitious U.K. port of Plymouth for further growth in commercial and tourist traffic.

Potential is seen particularly for increased trade through established services to Spain and France. Brittany Ferries is a major customer of the U.K.'s most westerly RO/RO port, which is operated by Associated British Ports. The attraction of more cruise shipping is another aim of the new terminal. Associated shoreside support facilities have been expanded substantially to cope with the doubled volume of cars, freight vehicles, and passengers.

This installation of another MGN link span follows a trend established by many port operaters worldwide—most recently at Bombay, India; Dartford, England; Oslo, Norway; and Rotterdam and Zeebrugge, Netherlands—seeking cost-effective, quick solutions for traffic expansion.

The new link span is sited at Plymouth's West

Wharf, Outer Basin, in the Millbay Docks, parrallel with an earlier line span. It is designed to receive the stern or bow ramps of freight or passenger ferries with lengths of up to 590 feet.

For further information on MGN access equipment,

Circle 18 on Reader Service Card

Cathodic/Electrolytic Engineers Offer Replacement Anode Service For Antifouling Systems

The recent collapse of the British company Elinca, whose antifouling and corrosion suppression systems are used by shipping operators in the U.S.A., has left many companies without a source for replacement anodes.

One of the few companies offering replacement anodes which are compatible with the system are Cathodic and Electrolytic Engineers Limited, now leading British specialists in antifouling equipment based on the electrolytic principle.

The C-2000 System which consists of copper and aluminium anodes fed by a low impressed electrical current, has been adopted by 16 navies throughout the world and is also used on numerous commercial vessels and offshore installations.

With anode life of approximately two years, the C-2000 System provides an effective and economical method of controlling marine growth, requiring minimal maintenance in operation.

Advice and technical support for the C-2000 System is available through an international network of agents who can undertake the installation of new Systems or replacement anodes.

For literature containing full information,

Circle 20 on Reader Service Card

Record Land And Marine Lifts Set By Amhoist Cranes —Literature Available

During the past few months, American Hoist & Derrick (Amhoist) Company cranes have made the world's heaviest lifts on both land and sea. Not only did the Amhoist cranes capture both world titles, but it was done in conjunction with one customer on separate projects.

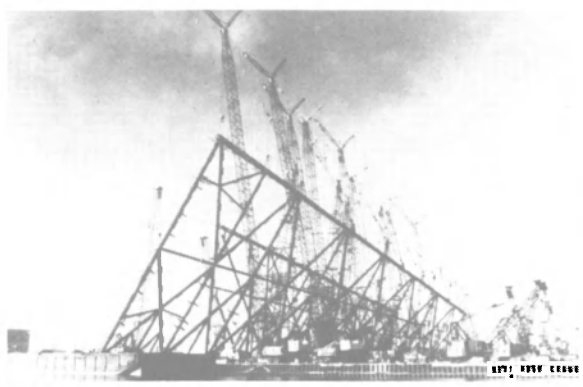
Amhoist established the world's heaviest recorded marine lift for a single crane pick during sea trials of McDermott's new DB 102, a semisubmersible crane vessel. Each of the two Amhoist revolver cranes aboard the vessel has a rated lifting capacity of 6,000 metric tons; they can lift more than 12,000 tons in tandem. During the sea trials in the Sea of Japan, each of the cranes lifted a test barge weighted to 7,260 short tons (110 percent of rated capacity), said to be the largest load ever lifted offshore by a single crane.

To set the land lift record, American cranes were used in the construction of an oil platform jacket being manufactured for Sohio Petroleum Company by McDermott's Marine Construction Fabrication Division in Morgan City, La. The lift involved a total of 35 crawler cranes (31 of them American) to roll-up and then lift and swing one side of the 890-foot, 3,785-ton jacket. Once the roll-up was complete and the framing row was at a near vertical position, the cranes carried it some 80 feet to a skidway. In order to accomplish the lift in perfect harmony, each of the 35 cranes was equipped with a radio and load-indicating instruments.

For additional information on Amhoist cranes,

Circle 19 on Reader Service Card

Two American cranes aboard McDermott's semisubmersible crane vessel DB 102 set world record for heaviest marine lift during sea trials, picking up a barge weighted at 7,260 short tons. The vessel is equipped with two Amhoist cranes capable of 12,000-ton lift when operated in tandem.



Thirty-five crawler cranes worked together to roll-up one side of McDermott oil rig platform jacket. After roll-up, cranes lifted the 3,785-ton framing row, carried it some 80 feet, and positioned it on a skidway. This is said to be the heaviest lift of its kind ever attempted. Thirty-one of the cranes were Amhoist.

NEW IMA TO PUBLISH REPORT ON NAVY SHIP SYSTEMS MARKET

Naval ships are complex platforms for ordnance, electronic and mechanical systems. Development and procurement of these systems generates an annual market exceeding $20 billion. This market will continue to grow significantly as ships become increasingly sophisticated. It is an enormously attractive market for developing new business opportunities. The emphasis on competition in defense procurement opens the market to any firm willing to make the marketing investment.

International Maritime Associates, (IMA) is preparing a business analysis of the Navy ship systems market. The report (approximately 200-page) will provide a very comprehensive assessment of current and future market opportunities, and will be available in June. Market updates will then be issued at three-month intervals.

The report and quarterly updating service will be available to subscribers for $480. For further information please contact J.R. McCaul, International Maritime Associates, Inc., 3050 K St NW, Suite 345, Washington DC 20007. Telephone (202) 333-8501. Telex: 64325 IMA.

Circle 145 on Reader Service Card

ADVERTISE IN THESE SPECIAL EMPHASIS ISSUES

BEST READ
BECAUSE EVERY ISSUE
IS CURRENT

SPECIAL NAVY COVERAGE

★ BONUS DISTRIBUTION AT MEETINGS & SHOWS

Subject to Change

FOR MORE MARINE SALES IN '86

AUGUST 1986 ISSUE

Advertising Closing Date—**July 11**

★ • **Nor-Fishing '86 Preview**
Trondheim, Norway—August 11-16

★ • **Offshore Northern Seas Expo**
Stavanger, Norway—August 26-29

• **Scandinavian Shipyards Review**

• **PLUS**—A wealth of current business and technical information first.

SEPTEMBER 1986 ISSUE

Advertising Closing Date—**August 12**

★ • **Preview—The Hamburg Show**
International Ship, Machinery & Marine Technology Trade Fair Hamburg, West Germany—September 23-26

• **German Marine Industry In The North American Market**—Machinery—Shipbuilding—Drydocking—Electronics

• **Naval Technology & Shipbuilding Edition**
Latest U.S. Navy Authorization Bill

• **A.S.N.E. Symposium**/Destroyer, Cruiser, Frigate Biloxi, Mississippi—October 2-4

• **PLUS**—A wealth of current business and technical information first

OCTOBER 1986 ISSUE

Advertising Closing Date—**September 11**

★ • **FISH-EXPO '86 Preview**
Boston, Massachusetts—October 15-18

• **Deck Machinery/Cargo Handling Review**

★ • **Pacific Marine Expo '86**
Seattle, Washington—November 20-22

★ • **Canadian Offshore Resources Exposition**
Halifax, Nova Scotia—October 7-9

• **PLUS**—A wealth of current business and technical information first

NOVEMBER 1986 ISSUE

Advertising Closing Date—**October 10**

★ • **SNAME ANNUAL MEETING**
Society of Naval Architects and Marine Engineers
New York, New York—November 19-22

• **PLUS—FIFTH ANNUAL SNAME INTERNATIONAL MARITIME EXPOSITION**
The most important U.S. marine industry show. For the fifth year, the prestigious Society of Naval Architects and Marine Engineers is sponsoring a trade show in conjunction with its internationally renown annual meeting and technical symposium in New York City.

The November special issue of MARITIME REPORTER will contain full details covering the entire technical program as well as the exhibition.

The November special issue will receive extra bonus distribution at SNAME.

• **PLUS**—A wealth of current marine business and technical information first position.

THE DOMINANT WORLDWIDE MARINE INDUSTRY MAGAZINE

- **World's Largest Requested Total Circulation—100%**
- **World's Largest Circulation to Buying-Influence Readers**
- **Largest U.S. Circulation to Buyers**
- **Largest Circulation to Navy Buyers**
- **Full Market Coverage—Ocean, Offshore, Inland, Navy**
- **Best Quality Circulation Records**
- **Most Current Circulation Records**
- **Current Editorial Content**
- **Largest Number of Advertisers**
- **Largest Number of Advertising Pages**
- **Produces Largest Number of Sales Leads**

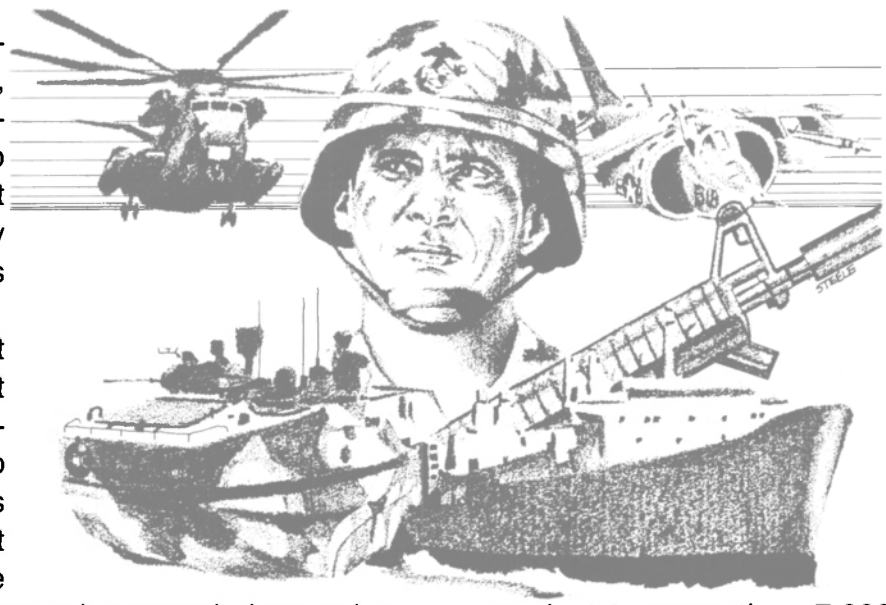
FOR BEST ADVERTISING RESULTS

MARITIME REPORTER AND ENGINEERING NEWS

118 East 25th Street
New York, NY 10010
(212) 477-6700

IS YOUR COMPETITION HERE?

**General Dynamics—General Motors—Bell Helicopter—FMC Corporation—
ITT—McDonnell Douglas—Cadillac Gage—Avco—
Chartered Industries of Singapore—LTV Aerospace & Defense—
Michelin Tire—Rolls Royce—United Technologies—Grumman Aerospace Corporation—
Canadair, Limited—AAI Corporation—Wild & Leitz—
Sperry—General Electric—Boeing Aerospace—Royal Ordnance**



Why do these businesses, and many others, representing over 50 percent of the world's top defense contractors, exhibit in the annual Modern Day Marine—Force in Readiness Military Exposition?

Because they know that this, the world's largest display of equipment, supplies and services relating to amphibious operations is one of the most important military expositions in the United States. Over 130 companies occupied more than 95,000 square feet of exhibit space at the Sheraton Washington in 1985, and early sales for the '86 exposition, scheduled July 22-24, have resulted in over 70 percent of the floor space already sold.

In addition to the exposition, special conferences and briefings on topics ranging from computers in the military to an update of new equipment entering the inventory are scheduled throughout the three days of the exhibit. Receptions in the exhibit hall, a grand banquet, and an awards luncheon serve to showcase your products. Present your product to more than 7,000 interested persons at the Modern Day Marine—Force in Readiness Military Exposition. Join the competition.

For More Information, Call or Write:

MODERN DAY MARINE
FORCE IN READINESS

Marine Corps League Exhibit Company
25 S. Quaker Lane, Suite 24
Alexandria, VA 22314
(703) 823-2333

Circle 261 on Reader Service Card

OVER 99% OF ALL SHIPLIFT OPERATIONS AROUND THE WORLD ARE ON SYNCROLIFTS®

There are very good reasons why Syncrolift is the world leader in shiplift technology with more than 160 installations in 59 countries. If you're planning a shipyard and comparing docking systems, find out why your best move is with Syncrolift.®

The largest shiplift platform in the world – 655 ft. long by 106 ft. wide at Todd Pacific Shipyards Corporation, Los Angeles Division.

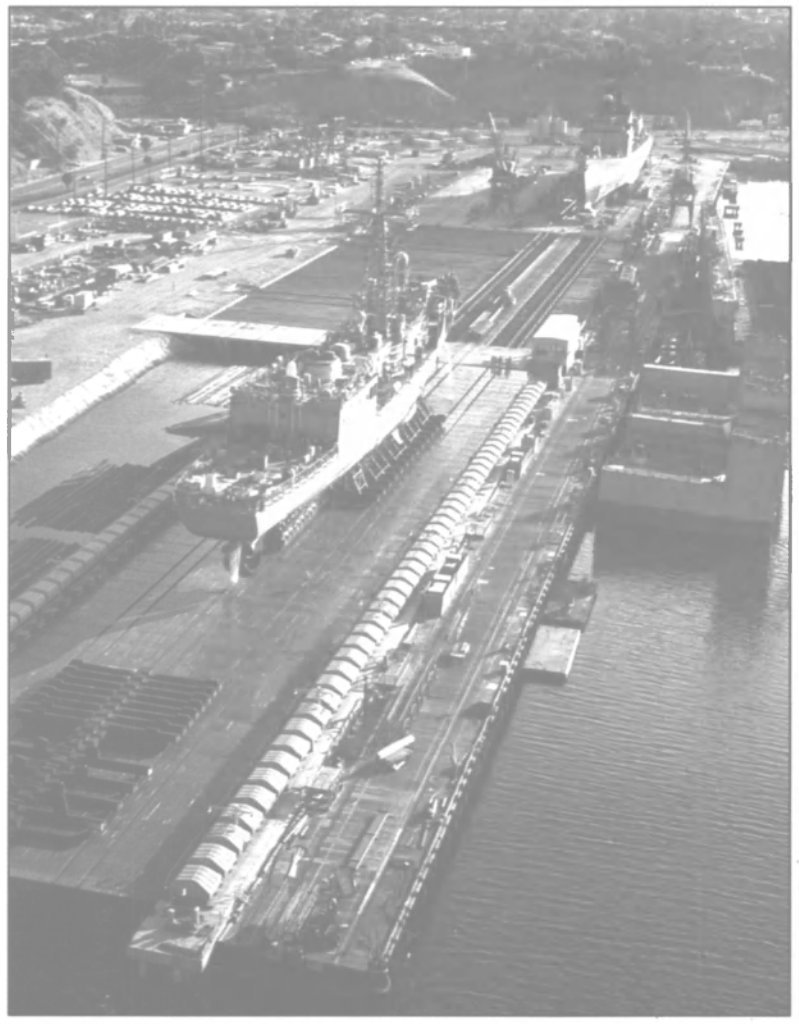
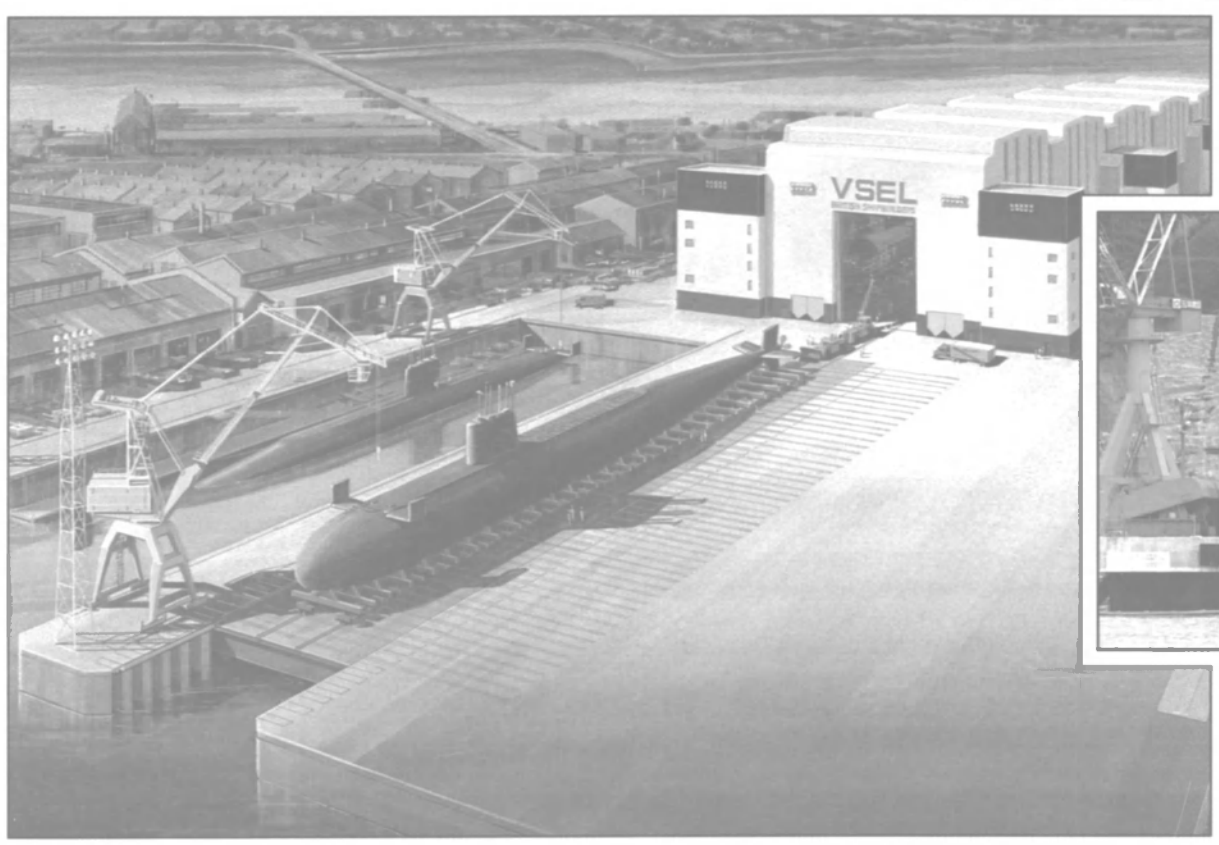


Photo by Joseph Ernest



The highest capacity per metre shiplift in the world – 200 tons per metre for launching concrete caissons at Yunotsu, Japan.

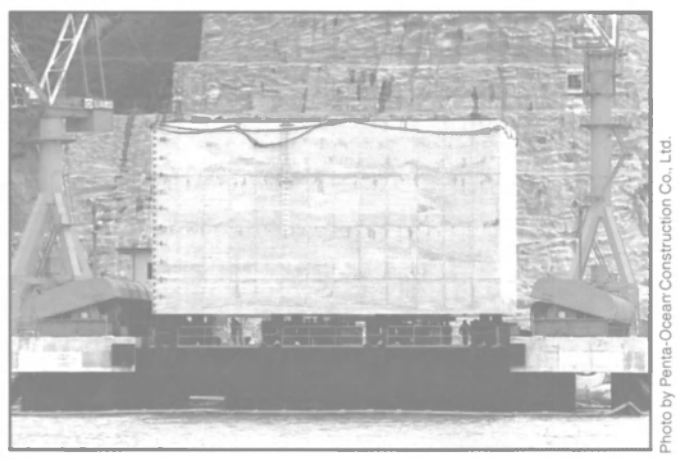


Photo by Penta-Ocean Construction Co., Ltd.

The greatest lifting capacity shiplift in the world – 24,000 tons for nuclear submarines at Barrow-in-Furness, England.

SYNCRO LIFT

World Leaders in Shiplift Technology

PEARLSON ENGINEERING COMPANY, INC.

8970 S.W. 87th Court, Miami, FL 33176 • U.S.A. • (305) 271-5721 • Facsimile: (305) 595-5134
Mailing Address: P.O. Box 560008 Miami, FL 33256 • U.S.A. • Telex: 051-9340 SYNCROLIFT MIA

Circle 115 on Reader Service Card

A MEMBER OF THE NEI GROUP