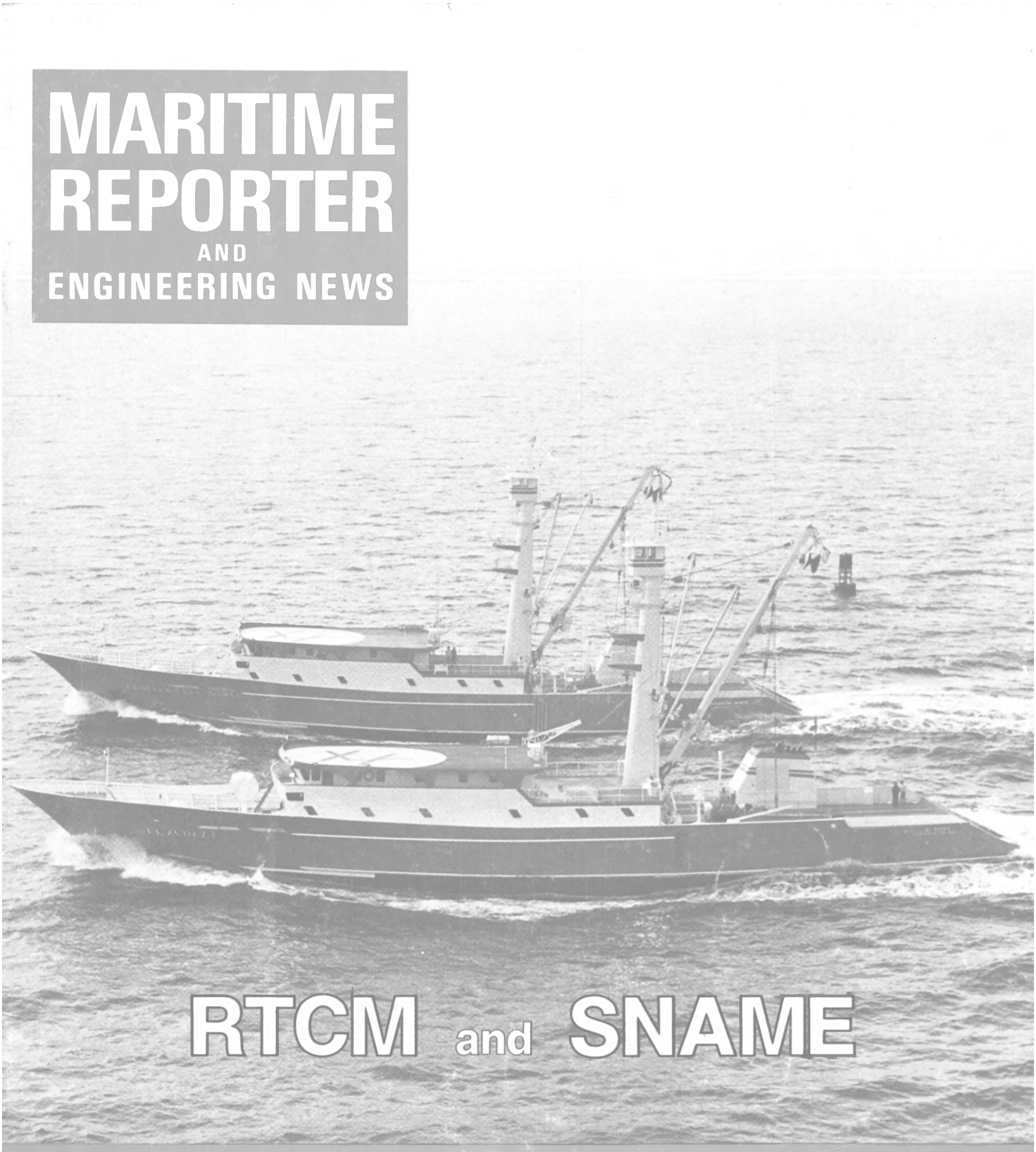
MARITIME
REPORTER
AND
ENGINEERING NEWS



RTCM and SNAME

The El Audaz (foreground) And The Centauro Del Norte

Bender Delivers Fourth Tuna Boat, The El Audaz

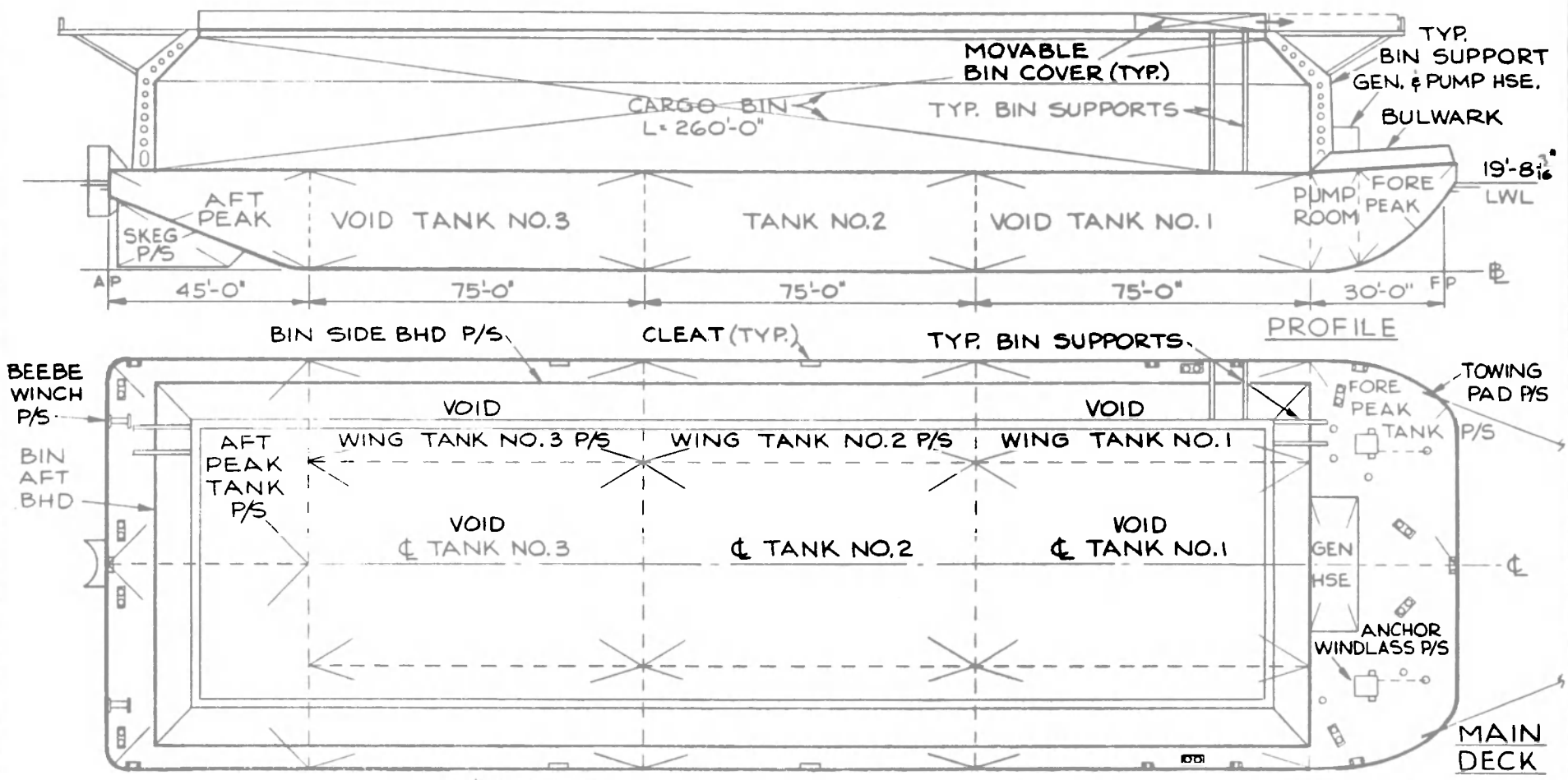
(SEE PAGE 4)

– Previews –
SNAME Spring Meeting And RTCM Assembly

(SEE PAGE 4)

MARCH 15, 1983

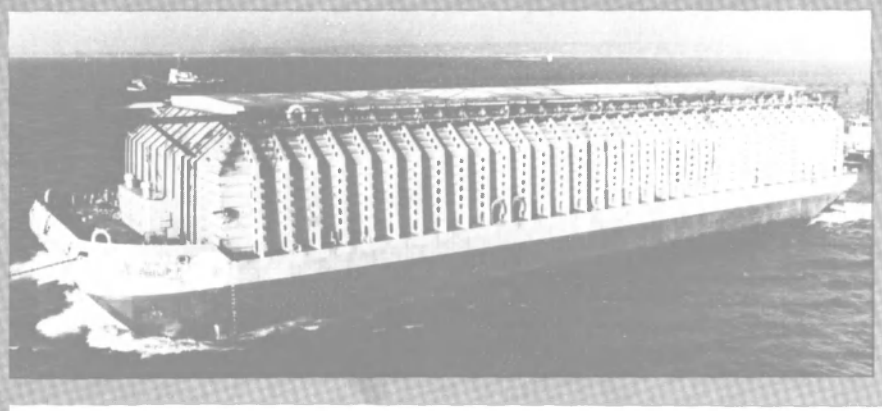
BULK TRANSPORTATION



PRINCIPAL CHARACTERISTICS

LENGTH, O.A.	309'-1 5/8"
LENGTH, B.P.	300'-0"
BREADTH	90-0"
DEPTH	22'-0"
DRAFT, SUMMER	19'-8 3/16"
DRAFT, LIGHT	3'-9 5/8"
DEADWT. @ 19'-8 3/16"	11,545 L.T.
CARGO BIN CAP'Y	600,000 FT³

CLASS-ABS ✠ A1 (E) BARGE
OCEAN SERVICE - UNMANNED



Barge available for charter. Suitable for coal, grain, phosphate and other dry bulk materials.

McAllister Brothers, Inc. Towing and Transportation. 17 Battery Place, **New York, N.Y.** 10004. (212) 269-3200.
Baltimore (301) 547-8678 • **Norfolk** (804) 627-3651
Philadelphia (215) 922-6200 • **San Juan** (809) 724-2360
San Francisco, LJT Marine Services (415) 777-1053

McAllister

Write **243** on Reader Service Card

ON THE COVER

Bender Delivers Fourth Tuna Boat
PAGE 8

1983 RTCM Assembly — A Preview —
PAGE 12

Preview SNAME Spring Meeting/ STAR Symposium
PAGE 18

MarAd Approves Charter Of APL Ship To MSC

The Maritime Administration has approved an application by American President Lines, Ltd., to charter the 22,000-dwt President Adams to the Military Sealift Command (MSC) for one year.

The partial-container vessel's operating-differential subsidy (ODS) payments will be suspended at the termination of the voyage preceding the charter. ODS will not be resumed until the ship is redelivered from the MSC. The vessel may not be subchartered or operated in the domestic trade without MarAd's permission.

Navy Awards Purifier Repair Contract To E. Elliott

E. Elliott and Associates, Inc., of Martinez, Calif., a firm specializing in marine engineering and repair services, has been awarded a three-year contract (contract No. N00228-82-D-6310) by the Naval Supply Center, Oakland, to repair and overhaul centrifugal fuel and lube oil purifiers on Navy ships in the San Francisco Bay area.

Elliott and Associates have complete overhaul and test facilities for centrifugal purifiers, including dynamic balancing and in-house testing. Joining the firm as the consultant on purifier repairs is **Victor Larson**. Mr. **Larson** has long been recognized as one of the Bay area's top experts on purifier repairs.

MARITIME REPORTER and Engineering News
Editorial and Executive Offices
107 East 31st Street, New York, N.Y. 10016
(212) 689-3266
ITT Telex: 424768 MARINTI

PUBLISHERS
John E. O'Malley
Charles P. O'Malley

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SALES OFFICES

New York, New York
Maritime Reporter & Engineering News
107 East 31st Street
New York, NY 10016
Telephone: (212) 689-3266

Houston, Texas
Robert Hawley
Gary Lindenberger
Mike Sullivan
11777 Katy Freeway, Suite 155
Houston, TX 77079
Telephone: (713) 870-0470

Italy
Mr. Vittorio F. Negrone
Ediconsult Internazionale
Piazza Fontane Marose
3 - 16123 Genova, Italy
Telex: 211197 EDINT 1

Scandinavia
Mr. Stephan R G Orn
Ab Stephan R G Orn
Box 106, S-271 00 Ystad, Sweden
Telex: 33335 ORN S

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Gibbs & Cox Announces Executive Appointments

Richard M. Ehrlich, chairman of Gibbs & Cox, Inc., New York, a leading independent naval architectural firm, recently announced that the board of directors of Gibbs & Cox, Inc. has elected **William K. Lyon** controller and division head-finance and administration. It was also announced that **Clifford G. Prime** has been promoted to assistant division head-finance and administration.

William K. Lyon joined Gibbs & Cox, Inc. over 30 years ago. Mr. **Lyon** served in various capacities, including his most recent position as assistant controller and assistant division head-finance and administration.

Clifford G. Prime joined Gibbs & Cox, Inc. over 25 years ago, serving in various capacities, including his most recent position as administrative service manager-finance and administration.

$12.5-Million Overhaul Contract Awarded General Dynamics For USS Fulton

General Dynamics Corporation, Quincy Shipbuilding Division, Quincy, Mass., has been awarded a $12,537,760 cost-plus-fixed-fee contract for the overhaul, alteration, and repair of USS Fulton (AS-11). The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-83-C-8538).

ASEA Awarded $3.5-Million Order For Shaft Generators —Literature Available

A contract worth approximately $3.5 million for seven shaft generator systems has been awarded to the marine department of ASEA Inc., White Plains, N.Y., by Stolt-Nielsen, Inc., the Greenwich, Conn.-based owner and operator of one of the world's largest chemical tanker fleets.

Due to be retrofitted in seven Stolt-Nielsen ships, the ASEA systems are expected to result in a yearly saving for each vessel of approximately $150,000. The systems are equipped with static converters and provide output power of 1,200 kva at 460 v, 60 hz. The generators will be coupled directly to the main engine and are designed to operate between 70-100 percent of main engine speed.

Included in the package is generator automation for load-sharing and prevention of blackouts, as well as for insuring smooth and rapid changeovers from shaft generator power to auxiliary diesel power, or vice versa. The first system is scheduled for delivery in July 1983.

For free literature,
Write 58 on Reader Service Card

$23-Million Container, RO/RO Port Inaugurated At St. Croix, Virgin Islands

The government of the U.S. Virgin Islands and the island's Port Authority recently inaugurated a new $23-million container and RO/RO port at St. Croix. The port was turned over to the islands by Hess Petroleum, its developer.

The port handles containers and trailers destined for St. Croix and also has 11 acres of bonded storage for transshipments or relay services. The facility is equipped with a Paceco 35-ton crane as well as a large warehouse, a 1,000-foot main dock, and two RO/RO ramps.

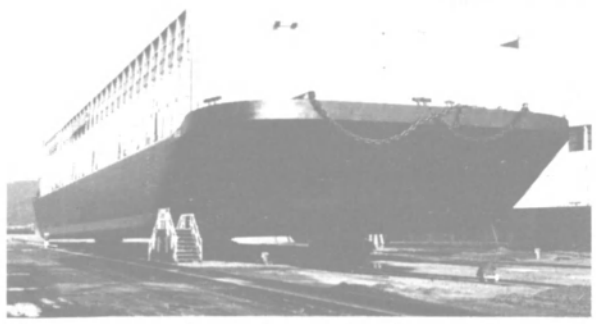
Whitecap Management of Greenwich, Conn. and its associates Merwin Shipping and Trading Co., of St. Croix have been authorized by the Virgin Islands Port Authority to market the services of the port.

Claes Westring, director of Whitecap, said that the development of the port is the result of strictly local initiative by the Virgin Islands' government and Hess Petroleum. No U.S. taxpayers money has been required. The port is not a part of the $350-million U.S. aid package for the Caribbean Basin Nations.

286-Foot Dual Purpose Barge Launched At Crescent City Yard

A new barge, the Rogue, was launched at Coos Bay, Ore., recently by Sause Bros. Ocean Towing Co., Inc. It was the second barge built at the barge yard of Crescent City Marine Ways and Drydock Co. in Eastside, Ore., since the yard was established in 1981.

The dual purpose barge, with dimensions of 286 feet by 76 feet by 18 feet, has a capacity of 7,300 short tons, and is designed to carry on-deck cargo or to serve as a tanker, transmitting up to 45,000 barrels of "C" bunker fuel in 10 tanks. It is equipped with stanchions the full length on both sides to facilitate handling of lumber or other deck cargo. The barge's tanks are equipped with heating coils which maintain heavy residual petroleum products at proper viscosity levels for pumping.



The cargo pumping system on the Rogue is powered by Detroit Diesels.

The Rogue was christened by **Mrs. Madeline Cox**, wife of **Dean Cox**, senior employee at the yard.

Sause Bros. Ocean Towing Co. operates a fleet of 12 tugs and 20 barges in regular service from Oregon and Washington ports to California and Hawaii, as well as charter and contract services to Alaska, Mexico, Central America, and the Pacific Rim.

Raytheon Service Awarded $1-Million Contract For TAKX Equipment

Raytheon Service Company, of Glen Burnie, Md., was recently awarded a contract exceeding $1 million by Bethlehem Steel Corp. as part of the Navy TAKX program. Raytheon Service Company will supply commercial electronic navigational and communication equipment for the three Maersk Line ships being converted for the Rapid Deployment Force.

The nucleus of the electronic system is the Raycon-1RT main radiotelegraph SOLAS console marketed by Raytheon Service. The unit features minimum radio room radiation hazard through the use of a unique coupler, latest solid-state technology, and high radiation efficiency.

Additional equipment to be supplied under the contract includes 1kw SSB band, satellite communication, ARQ error-correcting teletype system, watch receiver, EPIRB, Loran receiver, weather facsimile, and VHF.

Raytheon will test and prove all equipment operational. Equipment supplied will be serviced by Raytheon Service Company's worldwide service network to insure proper performance at the lowest possible maintenance cost to the shipowners.

Top Management Changes Announced By Dover-Norris

Edwin L. Bechtold

Thomas L. Reece

Thomas L. Reece has been named president of Norris Division, Dover Corporation, Tulsa, Okla., replacing **Edwin L. Bechtold** who will continue as a vice president of the parent company.

In his new role, Mr. **Bechtold** will assist Mr. **Reece** in the transition and will take on additional responsibilities in corporate development for both the Norris Division and Dover. Mr. **Bechtold** has been president of Norris Division since 1978. He came to Norris in 1968 as vice president of manufacturing and served as vice president and general manager of the pumps and general products operation from 1970 until his appointment as president.

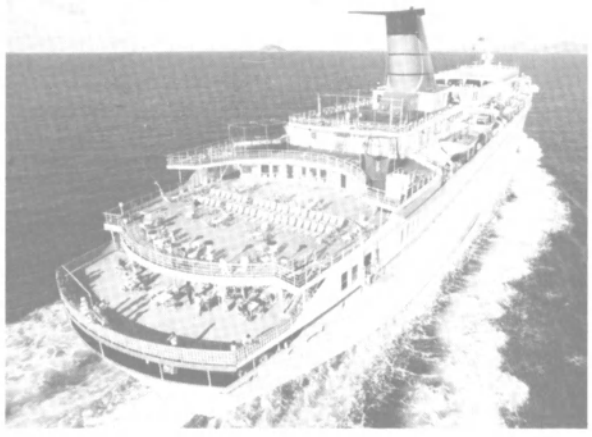
Mr. **Reece** has headed two other Dover divisions during the past 12 and a half years. In 1970, he was named president of Ronninger-Petter Division, Portage, Mich., and he was at the helm of the De-Sta-Co Division, Detroit, from 1978 until his move to Tulsa.

At the same time, announcement was

made of the appointment of **Loren Armstrong** as treasurer-controller for Norris. Mr. **Armstrong** comes to Norris from the financial department of International Harvester Company, Chicago. He replaces **Larry J. Renaud,** who was named general manager of Norris's controls operation in Houston.

Norris is a Tulsa-based manufacturer of sucker rods, pumps, valves, controls and other products used extensively in oil production.

Wartsila Diesels Ordered To Re-Engine Cunard Countess



The Cunard Countess will be fitted with four Wartsila Vasa auxiliary diesel engines.

The Cunard Line Ltd. has ordered four Wartsila Diesel heavy fuel engines — the Wartsila Vasa 4R32 type, for installation as auxiliary engines on the cruise liner M/S Cunard Countess. The engines are capable of burning poor quality fuels with substantial impurities and a viscosity of up to 380 cSt.

According to Wartsila Diesel, the choice of engines was based on extensive technical analysis of several engine types, with the primary objective to find economical and technically advantageous replacements. With the new engines the fuel costs of the ship are expected to be reduced by 35 percent.

The Wartsila Vasa 32 engine is one of the world's first purpose-designed medium-speed heavy fuel engines. The same engine type, in its 6-cylinder version, is used as auxiliaries on the M/S Song of America. Since it was introduced in 1977 this engine type has been widely used as both main and auxiliary engine on a variety of ships. With its seven different cylinder versions, the engine covers an output range of 1,335 to 6,140 kw at 720-800 rpm.

For more information,

Write 54 on Reader Service Card

Reliable Crane Offers 24-Page Catalog On Its Heavy-Duty Jib Cranes

The Reliable Crane Division of Stanspec Corporation, Cleveland, Ohio, is offering a free, fully illustrated, 24-page catalog on its complete line of heavy-duty jib cranes.

Reliable provides standard jib crane models with capacities from 500 to 10,000 pounds. Specially designed models are also available with capacities to 40,000 pounds, boom lengths up to 50 feet, and either motorized or manual rotation controls.

Boom rotations, depending on model, range from 200 to 360 degrees. Mountings available include column mount, base plate, concrete insert, tie rod, and compression-braced wall type mountings.

For a free copy of the catalog,

Write 57 on Reader Service Card

Parmer Named Operations Manager And Burkes Crew Dispatcher At Scott Chotin

Carlton Parmer

Robert T. Burkes

Scott Chotin Inc., of Mandeville, La., recently announced the appointment of **Carlton J. Parmer** as manager of operations to be headquartered in the firm's main office at Mandeville.

His responsibilities will include all areas of motor vessel operation, personnel department supervision, salary administration, and safety administration.

Also new at the firm is **Robert T. Burkes,** crew dispatcher who will handle all crew dispatching for the company's nine vessels. His responsibilities will include interviewing, scheduling, and dispatching vessel crews.

ON THE COVER

The El Audaz (foreground) underway with the Centauro Del Norte

Bender Delivers Fourth Tuna Boat

Bender Shipbuilding and Repair, Mobile, Ala., recently delivered the 3,600-horsepower, 225-foot tuna boat "El Audaz," its fourth tuna purse seiner in a four-boat order.

When the shipbuilder finished the outfitting, the El Audaz cast off with sister vessel the Centauro Del Norte from Mobile for fishing in the Pacific.

"This represents something of a milestone for us," explained president **Tom Bender Jr.** "We have successfully executed one of the most advanced designs for vessels in this size range. Completing this fully molded hull with aluminum superstructure, together with their other sophisticated systems, represents an advancement of our proven capabilities. And we did it not once, but four times. We thank our Mexican friends for awarding us this contract and thus recognizing that we are not just another shipyard."

The El Audaz was christened by **Maria Elena Estrada Del Castro Y Castro,** wife of the Director of Coordination and Promotion for the Mexican Government organization, Conasopa.

The steel-hull tuna boats are capable of carrying 1,200 tons of fish, 85,000 gallons of fuel, without fishwells, and approximately 200,000 with fish wells, and 8,500 gallons of water at a swift 16 knots.

The only part of the two vessels made of aluminum are the pilothouses which are reinforced for helicopter landings.

Main propulsion power is provided by a 20-cylinder EMD diesel (Model 20-645-E7) which produces 3,600 horsepower at 900 rpm.

This power is transmitted to a Rice, four-blade, highly skewed propeller through a Falk gear box. Main engine controls are by Mathers of Seattle.

Auxiliary power is provided by three Caterpillar D3408 diesel engines each developing 285 kw at 1,800 rpm. The main hydraulic power source is a Cat 3408 which develops 500 hp at 2,100 rpm's. Steering gear is hydraulic, a Wagner LAZ-16-35 furnished by W.E. Hough of Seattle.

Four 100-hp Vilter compressors are used to power the ammonia refrigeration system and the bow thruster is Michigan/Jastram 49" prop model BU60, powered by a GM 12V71 diesel engine (400 hp at 2,100 rpm).

The main hydraulic systems are furnished by Marco of Seattle. They include the WS 454 Super Seiner II Seine Winch, 3020 Cork Line Winches, WO 332 Brailing Winch and B56A Power Block.

Also supplied were miscellaneous Gearmatic winches for vanging, topping, choking and strapping. Incorporated into the hydraulic system is a Slattery "Alaska Marine" deck crane on the forward deck and a Morris Whaley ring stripper. Navigational aids include a Sperry 8T autopilot and a Mark 37 gyrocompass.

Electronics, furnished by Honor Marine of San Diego and installed by Sassman Electronics of Mobile, include two Furuno FR1011 radars, Whelen strobe light, Furuno FE-8130F echosounder, TAIYOADF, Furuno VHF/ADF, Navidyne ESZP, 3000 satellite navigation, Hull 2320A radiotelephone, Morrow SSB, Hull 922R/5, Raytheon VHF, R/T System, Honor Marine PA system, Furuno FAX143 facsimile recorder, Bear Cat 300 scanning receiver, Sea Temp seawater temperature monitor and Telcor windspeed. A Krupp-Atlas sonar model 950 has also been included in each electronic package.

Other equipment includes pumps by Crane Deming, Buffalo Forge fans, Red Fox sewage treatment systems, Westphalia centrifuges, Quincy air compressors, alarm systems by Argus, Halon Fire Suppression system in engine rooms by Ansul, Cutler Hammer controllers, Waukesha stern bearings and seals, Hose McCann navigation light systems, paint systems by International Paints, Englehart chloropacs, Everpure chlorinators and Micros 111P watermakers.

NASSCO Awarded Overhaul Contract For USS Hepburn Valued At $30.9 Million

National Steel and Shipbuilding Company, San Diego, Calif., has been awarded a $30,945,342 cost-plus-fixed-fee contract for regular overhaul of USS Hepburn (FF-1055) with an option to have a regular overhaul on the USS Cook (FF-1083). The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-83-C-8515).

MarAd Releases Annual Update Of Shipbuilding And Repair Facilities

The Maritime Administration has released its annual update of the publication "Report on Survey of U.S. Shipbuilding and Repair Facilities."

This survey is required by law primarily for use in determining whether an adequate mobilization base exists for national defense and for use in a national emergency. Limited copies of the 146-page report are available from MarAd's Office of Public Affairs, Room 7219, Nassif Building, 400 Seventh Street S.W., Washington, D.C. 20590.

ITC Offers Brochure Describing Its New Heavy-Lift Vessel

International Transport Contractors (ITC-Holland) of Haarlem, Holland, is offering a free eight-page color brochure describing its new very large semi-submersible ship the Sibig Venture. The vessel was constructed by Astilleros Espanoles S.A. (AESA) and recently completed sea trials successfully.

The brochure contains a complete description of the new vessel including a series of drawings illustrating the manner in which different types of heavy cargo can be transported safely and efficiently. A complete description of the new ship includes dimensions, profile drawings, deadweight scales, capacities and details on equipment such as the main engines, communications equipment, cargo handling gear, lifting gear, four-point mooring systems, etc. The Sibig Venture can transport very heavy loads of up to 44,000 tons deadweight, at a 3-meter freeboard. The vessel is capable of handling large offshore drilling rigs, platform jackets, cranes, entire dredges and industrial plants.

ITC-Holland has been well-known for years as a world leader in the heavy cargo transport field. The company has seven tugs of 15,000 IHP each in addition to its heavy lift vessels and is actively engaged in conventional towing operations in addition to the heavy lift phase of the business.

For a free copy of ITC's new heavy lift brochure, "Ready For Lift-Off,"

Write 73 on Reader Service Card

Service Machine Group Awarded Contract For Aminoil Production Platform

Service Machine Group, Inc. of Morgan City, La., has been awarded a contract by Aminoil U.S.A., Inc., for the fabrication of an 8-pile, 18-slot drilling and production platform. The structure, designated as the "B" platform for High Island Block 310, is for 212-foot water depth. Delivery is scheduled for September 1983.

Onan Offers Literature On New Family Of Marine Diesel Propulsion Engines

The Onan Corporation, of Minneapolis, Minn., a subsidiary of the McGraw-Edison Company, is offering literature describing its newly designed and developed family of marine propulsion engines.

Features and options on the L317D-M and L423D-M engines include a marine cooling system, marine gears, marine alternator, and mounting system. The L317D-M is rated at 43.5 hp (32.5 kw) and the L423D-M is rated at 60 hp (44.8 kw) at 3,600 rpm.

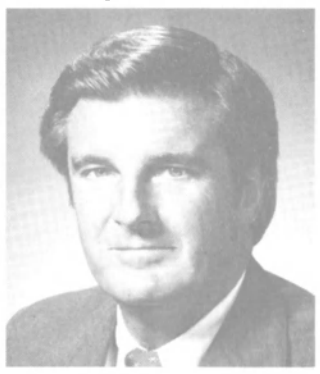
For complete information,

Write 70 on Reader Service Card

Western Electric Awarded $4.2-Million Modification To Oceanographic Contract

Western Electric Company, Greensboro, N.C., has been awarded a $4,290,944 modification to a previously awarded cost-plus-incentive-fee / cost-plus-fixed-fee contract for oceanographic systems. The Naval Electronic Systems Command, Washington, D.C., is the contracting activity (N00039-82-C-0443).

Stienecker Appointed Corporate Vice President At Crowley Maritime



Brent A. Stienecker

Brent A. Steinecker has been appointed corporate vice president of Crowley Maritime Corporation of San Francisco, Calif., according to a recent announcement by **Leo L. Collar,** CMC executive vice president, operations.

In the newly created position, Mr. **Stienecker** oversees corporate staff departments, including marine operations, marketing, legal counsel, and labor relations. Additionally, he continues responsibilities as general manager of Crowley's California Division. He is based at corporate headquarters in San Francisco.

Mr. **Stienecker** joined Crowley in 1975 and directed marketing activities for the company's Northwest and Alaska Division prior to his assignment in the California Division. Before his association with CMC, he held successive managerial posts in industrial relations, marketing, and finance for a large industrial firm.

American Ship Building Elects Edward J. Lasko Vice President-Finance

Edward J. Lasko has been elected vice president-finance of The American Ship Building Company, Tampa, Fla., it was announced recently.

Mr. **Lasko** had been corporate controller since September 1979. Prior to joining American Ship, he was assistant corporate controller at Addressograph Multigraph Corporation and corporate controller at Hauserman, Inc.

J.C. Leighton Elected Executive VP Of Raymond Kaiser Engineers

J.C. (Jock) Leighton has been elected executive vice president of Raymond Kaiser Engineers Inc., a wholly owned subsidiary of Raymond International Inc. based in Oakland, Calif. He also was elected a member of the executive committee of the subsidiary's board of directors.

Mr. **Leighton,** who joined the company in 1964, was formerly Raymond Kaiser Engineers' group vice president, international operations. Earlier he was vice president, Latin American operations, headquartered in Rio de Janeiro. He has managed major industrial projects for Raymond Kaiser Engineers in Australia, New Zealand, Wales and India.

Mr. **Leighton** began his career as a design engineer in London in 1950 and later worked on assignments in the United States, Chile, Haiti, and Canada. He was graduated from the University of Aberdeen, Scotland, with a degree in civil engineering. He is a member of the American Society of Civil Engineers.

Free Literature Offered On New Oily Water Separator By Hamworthy Engineering

Literature is being offered detailing a compact, highly efficient oily water separator, the latest product being marketed by the Pump & Compressor Division of Hamworthy Engineering Limited of Poole, Dorset, U.K., to combat pollution by ships' bilge and ballast discharge.

Hamworthy spent over two years in research and development of the unit which has been granted IMO approval in accordance with A393(X) and certification by marine classification societies. The unit is a two-stage device, the first stage being a gravity tank and the second a plate-type separator. Two identical positive displacement pumps are mounted on top of the fabricated steel separator vessel.

Most existing separators pump oily water from the bilges into a separator. This action breaks down the oil into tiny droplets making separation more difficult. The Hamworthy system draws oil into the separator and uses the natural gravitational differential to achieve a high degree of primary separation.

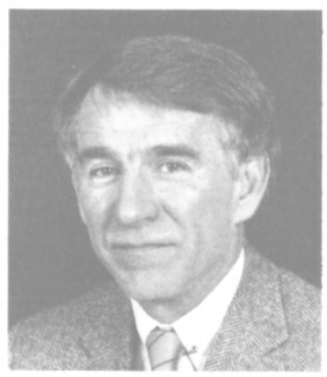
The unit is built and supplied as a complete module requiring no additional equipment. Shipyard installation work is limited to connecting electrical and inlet and outlet connections. No filters are required and it is easily serviced. The fully automatic unit has capacities up to 5 tons per hour.

For a free copy of the brochure,
Write 36 on Reader Service Card

$13.5-Million Navy Contract To M. Rosenblatt & Son

M. Rosenblatt & Son Incorporated, naval architects, has been awarded a $13,537,459 cost-plus-fixed-fee contract to provide engineering support services to the Naval Ship Weapons Systems Engineering Station, Port Hueneme, Calif., for revision and update of Navy ships' hull, mechanical and electrical systems technical manuals. The work will be performed in San Diego, (20 percent), and Oxnard, Calif. (30 percent), and at Bremerton, Wash. (50 percent). The Naval Regional Contracting Center, Long Beach, Calif., is the contracting activity (N00123-83-D-0137).

New Firm Will Advise Manufacturers On How To Sell To Navy



David R. Banner

A new company which will offer specialized support to industrial and aerospace companies in developing and selling products and services to the Navy shipbuilding programs was formed recently.

Defense-Marine Marketing, Inc. of Annapolis, Md., was founded by **David R. Banner**, a Naval Academy graduate with many years of experience in working with the Navy shipbuilding and other defense-related projects. DMMI will offer field sales services to major shipyards and other design locations as well as a broad range of services to clients interested in the Navy market, including market research and Washington, D.C., representation.

For the past 10 years, Mr. **Banner** has been national marine and military sales manager for Aeroquip Corporation of Jackson, Mich. He is a former submarine officer, and has done graduate studies in underwater physics.

For further information,
Write 61 on Reader Service Card

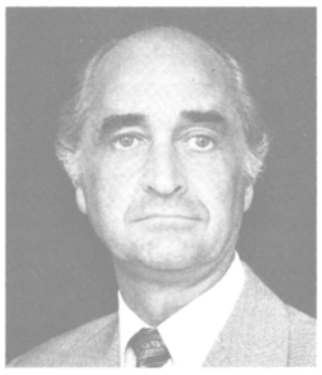
Swiftships To Build Two Fire/Rescue Boats For Plaquemines Parish

Swiftships, Inc., of Morgan City, La., has been awarded a contract to build two 50-foot aluminum fire/rescue boats for the Plaquemines Parish Commission Council.

The all-aluminum vessels are designed for fire-fighting, paramedic, and rescue work. They will operate in Plaquemines Parish at various points along the Mississippi. They are scheduled for delivery to the council in early June of 1983.

The vessels will be 50 feet long overall with a beam of 16 feet and a draft of 3 feet. Each vessel will be powered by a GM 8V-92 turbocharged diesel engine producing a 26-knot speed. Fire-fighting capability includes carrying 300 gallons of foam and a pumping capacity of 1,500 gpm at 150 psi. The full load displacement of each vessel is 42,000 pounds.

New Shipbuilders Council President Selected



M. Lee Rice

Edward J. Campbell, chairman, executive committee of the Shipbuilders Council of America, the national industry association of shipbuilders, ship repairers and ship component manufacturers, has announced selection of **M. Lee Rice** to succeed **Edwin M. Hood** as president of the council.

Mr. **Rice,** 58, is president and chief executive officer of Ogden Transportation Corporation, New York, N.Y., subsidiary of Ogden Corporation, and is well-known in the American maritime community. His selection was unanimously approved by the council's executive committee.

In making this announcement, Mr. **Campbell,** who is also president of Newport News Shipbuilding, said: "The Shipbuilders Council of America is very fortunate to obtain the services of **Lee Rice**. He is a corporate executive with vast experience in shipbuilding, shipping and ship financing matters as well as in government and public affairs.

"Since 1979, he has represented Avondale Shipyards, Inc., a unit of Ogden Transportation, on the council's board of directors. In that capacity, he has taken an active role in pursuing the council's objectives, and has, in fact, been chairman of a subcommittee on future directions.

"Lee **Rice** knows the ins and outs of the American shipyard environment, as it pertains to both commercial and naval shipbuilding and repairing, and is eminently qualified to serve as president of the council."

Mr. **Rice** has been a senior official, board member and executive committee member of multi-faceted Ogden Corporation since 1967. From 1950 to 1967, he was an executive with Atlantic Research Corporation, Alexandria, Va., an advanced technology company, and served as president from 1962 to 1967. He graduated summa cum laude from Western Maryland College, Westminster, Md., in 1948 with a B.A. degree in mathematics and physics.

Mr. **Rice** will join the Shipbuilders Council as president-elect on June 1 and will take over full responsibilities when Mr. **Hood** retires on June 30. Thereafter, Mr. **Hood** will have the title of president emeritus and for a period of one year will undertake special assignments on behalf of the council's board of directors. Mr. **Hood** is retiring, under the council's policy of mandatory retirement, at age 65, after nearly 24 years' service, almost 22 years as president.

Savannah River, Savannah, Ga.

— A PREVIEW —

1983 RTCM ASSEMBLY

Savannah, Georgia — April 17 — 20

The Radio Technical Commission for Maritime Services (RTCM) will hold its 1983 Annual Assembly Meeting April 17-20 at the Hyatt Regency Hotel in Savannah, Ga. The Assembly is being hosted by the United States Power Squadrons.

During the Assembly there will be special committee meetings and some 26 technical papers will be presented, based on the theme "Maritime Telecommunications—Today and Tomorrow."

The RTCM was established in 1947 as a government/industry organization under the aegis of the Department of State. In 1972, after passage of the Federal Advisory Committee Act, it became a Federal Advisory Committee chartered by the Federal Communications Commission. Today, it is structured as a nonprofit, tax-exempt organization.

Today's RTCM is a streamlined version of the original RTCM and has inherited its mantle. All segments of the marine field—government, private industry, labor, environmentalists, consumers — are partners in providing a broad-based overview of the industry. In the interest of Federal economies, government agencies no longer provide funding; however, as a privately supported organization, RTCM's goals remain the same: ". . . to advance the technical quality and professional application of maritime telecommunications for the benefit of all concerned . . ."

"Telecommunications" as used by RTCM means any transmission, emission or reception of signs, signals, writing, images, and sounds or intelligence of any nature by wire, radio, optical, and other electromagnetic or visual systems.

Membership in RTCM is open to all United States citizens and organizations having an interest in furthering the objectives of RTCM. Associate membership is open to foreign citizens and organizations.

Technical Papers

The technical papers will be presented each day, April 18 through April 20, in eight sessions. Following the technical sessions the electronic manufacturer's equipment display area will be open.

The papers to be presented are:

"The Federal Government's Radionavigation Planning Process" by **David C. Scull**, U.S. Department of Transportation.

"The Evolution of the Shipboard Automated Information Logger (SAIL) System" by **Lawrence W. Moore**, Environmental Research and Technology Incorporated.

"The MarAd Program for Upgrading Reserve Fleet Telecommunications Capabilities" by **James C. McCoy**, U.S. Maritime Administration.

"Marine Weather Programs" by **J.W. Nickerson**, U.S. National Weather Service.

"The COSPAS/SARSAT Program — A summary of Performance of the 406 MHz System" by **D. Levesque** and **Ph. Goudy**, Centre National d'Etudes Spatiales (CNES), France.

"United Kingdom Overview of the Results of WARC 83" by Dr. **K.A. Hughes**, Home Office, Directorate of Radio Technology, United Kingdom.

"FCC Maritime Mobile Activities" by **Charles Fisher**, Federal Communications Commission.

"The National Marine Electronics Association" by **C.S. Carney**, Nav-Com Inc.

"Navy / Merchant Ship Interoperability — Today, Tomorrow, and the Future" by **E.J. Bender**, Comsat General TeleSystems.

"Gaps in Infrastructure Communications in Maritime Communications and Distress" by Col. **J.D. Parker**, United Kingdom.

"Medical Advice Through Maritime Telecommunications" by **Bob Matte**, Medical Advisory Systems.

"A Synthetic Narrow-Band Filter that Exhibits Unity Q (O Group Delay) Characteristics with Application to Loran-C Signal Enhancement" by **Les Brodeur**, Sanders Associates.

"COSPAS/SARSAT — Current Status, Summary of Results, and Outlook" by **Thomas E. McGunigal**, U.S. National Aeronautics & Space Administration.

"Current Status of the Ionospheric Refraction Correction Algorithm for Single-Frequency Doppler Navigation" by **W.J. Geckle**, The John Hopkins University, Applied Physics Laboratory.

"Development of Digital Selective Calling in Norway" by **P.**

(continued on page 15)

World-Wide Standard of DF Performance & Reliability

For more than 30 years, Servo has set the standard in Doppler DF systems for marine, aviation and ground applications throughout the world.

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'83 RTCM Assembly

(continued from page 12)

Bliksrud, Norwegian Telecommunications Administration.

"Seaplan: A Service to Maritime Interests" by **Louis M. Reinkens** and **Peter H. Gretz,** Lockheed Dataplan, Inc.

"IMO, RTCM and the Coast Guard" by Capt. **M.E. Gilbert,** USCG.

"Issues for WARC-87 As a Result of Decisions Taken at WARC-83" by **J.W. Egan,** Department of Communications, Canada.

"Choosing a Satellite Constellation for the Search and Rescue Satellite System" by **H.D. Black, A. Eisner** and **J.A. Platt,** The Johns Hopkins University, Applied Physics Laboratory.

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"An International VHF-FM Maritime System — Do We Have It? Do We Need It? Do We Want It?" by **C.H. Gray,** communications consultant.

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The RTCM has established offices at 1629 K Street, NW, Washington, D.C. 20006. The telephone number is 296-6610.

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10:15-10:30 am Coffee break
10:30-11:45 am Annual business meeting
12-2 pm Luncheon with keynote address
2:15-3:45 pm Technical session I-A
3:45-4 pm Coffee break
4-5:30 pm Technical session I-B
5:30-7:30 pm Electronic manufacturer's equipment display areas open

April 19, 1983

8:30 am Registration
9-10:30 am Technical session II
10:30-10:45 am Coffee break
10:45-12am Technical session III
12:15-2:15 pm Special interest group luncheons
2:30-6 pm Electronic manufacturer's equipment display areas open
7-10:30 pm Dinner at Savannah Yacht Club

April 20, 1983

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9-10:30 am Technical session IV-A
10:30-10:45 am Coffee break
10:45-12 am Technical session IV-B
12:15-2:15 pm International luncheon
2:15-3:30 pm Technical session V
3:30-3:45 pm Coffee break
3:45-5 pm Technical session VI
5-5:15 pm Closing remarks
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Test Results Of Thordon Rudder Bearings Offered By Thomson-Gordon

Thomson-Gordon Ltd., of Burlington, Ontario, Canada, is offering information on field tests of Thordon molded stave rudder bearings.

According to the company, wear figures indicate that the bearing can reasonably be expected to last as long as the vessel. Thordon, a resilient-elastomeric product, is a replacement for phenolic rudder stock stave bearings.

Among the test results were: steering torque values reduced 30 percent, and the bearings operated with water, oil, or grease lubrication, or in the dry condition.

For more information,

Write 69 on Reader Service Card

MarAd Awards Support Contract For CAORF To Ship Analytics

The Maritime Administration has awarded a $540,836 contract to Ship Analytics of Centerport, N.Y., to provide engineering maintenance and operations support for MarAd's Computer-Aided Operations Research Facility (CAORF).

CAORF, operated by the National Maritime Research Center on the campus of the U.S. Merchant Marine Academy at Kings Point, N.Y., uses a bank of computers to generate radar signals and visual imagery on a 240-degree screen surrounding a ship bridge mock-up. The facility is used for research on collision-avoidance techniques, control and maneuverability methods, harbor and waterways problems, ship bridge design, and ways to train and certify watchstanders.

The contract is for one year, but contains options for up to two one-year extensions.

Centrico Offers Free 124-Page Guidebook On Westfalia Oil Separators

A free, full-color, 124-page ring-bound book is now being offered by Centrico, Northvale, N.J., completely describing the full line of Westfalia Mineral Oil Separators for diesel lube oil and fuel oil as well as for the demineralization of lube oils for gas turbines.

This very informative book is filled with detailed data, diagrams of equipment, installation diagrams, drawings, full-color cutaway illustrations, and four-color photographs.

Individual units are examined in detail and complete information is included on the firm's "Centri-Pack" packaged systems which are delivered complete and ready for fast, economical shipboard installation. "Centri-Pack" includes all components necessary for full operation already installed on a single sturdy base. Included are the separator, motor, pumps, pre-strainer, thermostatically regulated pre-heater, motor control and timing unit, supervisory equipment, etc.

Full information is included on weights, dimensions, pipe sizes, and proper means of lifting and installation. There are pages with correct data necessary for use of Westphalia separators with engines manufactured by MAN-B&W, Sulzer, Deutz, MWM, Pielstick, etc. Diagrams and tables are included which contain complete installation and working instructions. There is also a section on the use of future fuels.

For a free copy of this informative 124-page reference book,

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Navy Awards Magnavox $29.7-Million Contract For 97,638 Sonobuoys

Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind., has been awarded a $29,765,204 firm-fixed-price contract to furnish 97,638 AN/SSQ-53B sonobuoys with associated data. The place of performance is Garrett, Ind. The Naval Avionics Center, Indianapolis, is the contracting activity (N00163-83-C-0067).

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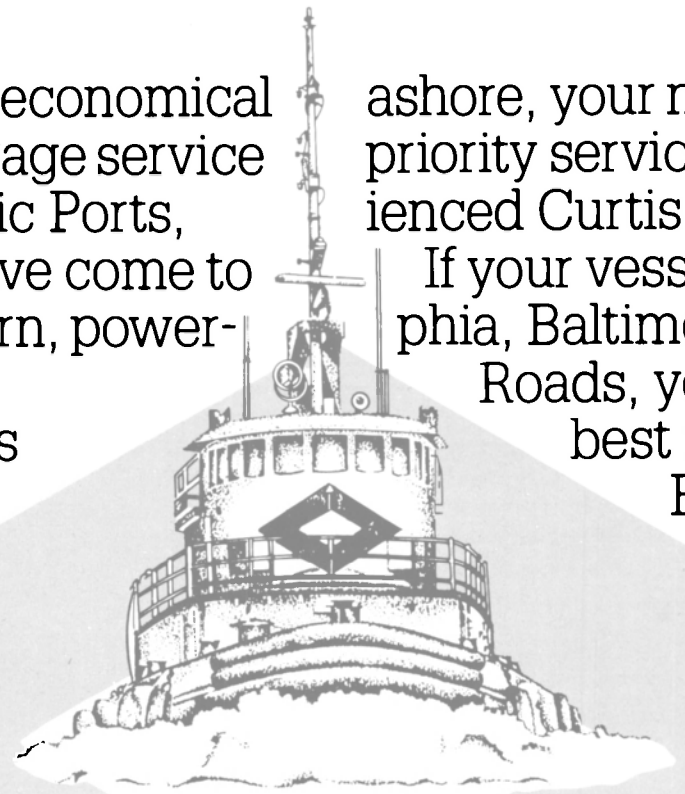

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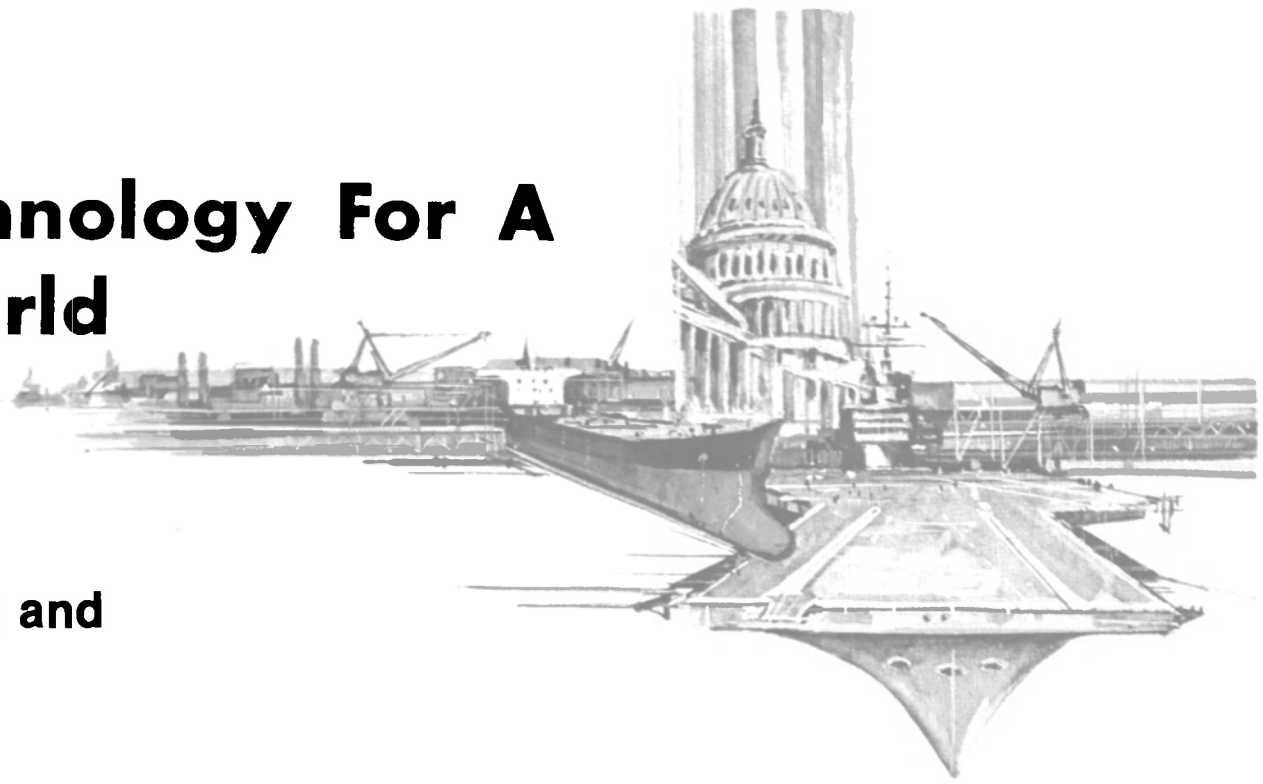
Maritime Technology For A Changing World



SNAME Spring Meeting and STAR Symposium

Washington, D.C. — April 6-8

The maritime world, indeed the world at large, is changing rapidly. What has happened and is going to happen will be the focus of The Society of Naval Architects and Marine Engineers' Spring Meeting/STAR Symposium in Washington, D.C., April 6-8, 1983. The theme, "Maritime Technology for a Changing World," or the locale could not be more appropriate, in the light of all the changes and new policies that are taking place in government, which so affect the maritime and related industries.

To be held at the L'Enfant Plaza Hotel, the meeting will feature addresses by key maritime leaders, sessions of technical papers, panel discussions and other elements that will make up an outstanding program.

This will be the eighth STAR Symposium, a series begun some years ago by the Society, (STAR stands for Ship Technology And Research), and now combined with its Spring Meeting. All programming efforts are being directed by the Society's host Chesapeake Section, the Steering Committee under **Walter Schmid**, and the Technical Program Committee led by **Marvin Pitkin**.

Outstanding speakers have been assembled for the first day of the meeting, April 6. These include at least 10 dignitaries from the private, public and military sectors who will speak on "The Changing World." A panel discussion of all these speakers will conclude the first day. There will be many opportunities for registrants to participate in the discussions.

The second and third days, April 7 and 8, will feature concurrent technical sessions, with a variety of papers on "Man/Machine Technology" and "New Directions." These presentations will include papers on computer-aided design, energy, human factors and simulation. The technical portions of the meeting will conclude with two panel discussions, one moderated by **Phillip Eisenberg**, on "New Directions for Offshore Development," and the other by Wolfgang **Reuter**, on "Education to Support Ship Design and Construction."

An entertaining social program will be provided which will include the President's Reception, the President's Luncheon, and tours to the Kennedy Center and Mount Vernon.

Technical Sessions

Session I—Wednesday, April 6.

Theme — "The Changing World"

Welcoming Address: Walter E. Schmid, chairman of 1983 Spring Meeting/STAR Symposium.

Moderators: Morning session, "Commercial Requirements of the Eighties," **Marvin Pitkin**, Technical Program Chairman.

Afternoon session, "National Requirements of the Eighties," Vice Adm. **Earl B. Fowler**, USN, Commander Naval Sea Systems Command.

Paper No. I-1 — "Future Requirements of the Offshore Marine Industry" by **Carl H. Savit**, senior vice president technology, Western Geophysical Company.

Paper No. I-2 — "Future Requirements of the U.S. Domestic Marine Industry" by **Anthony L. Kucera**, president, American Waterways Operators, Inc.

Paper No. I-3 — "Future Requirements of the U.S. Port Industry" by **J. Ron Brinson**, president, American Association of Port Authorities.

Paper No. I-4 — "Future Requirements of Liner Vessels" by **W. James Amoss**, president, Lykes Bros. Steamship Company.

Paper No. I-5 — "Future Requirements of Tank Vessels" by **Frank J. Iarossi**, president, Exxon Ship Company.

Paper No. I-6 — "Future Requirements of Bulk Vessels" by **Charles Kiskaddon Jr.**, president, Alcoa Steamship Company.

Paper No. I-7 — "Future Requirements of the Maritime Industries" by Hon. **Harold E. Shear**, Adm. USN (ret.), Maritime Administrator.

Paper No. I-8 — "Future Requirements of Coast Guard Vessels" by Adm. **James S. Gracey**, Commandant, U.S. Coast Guard.

Paper No. I-9 — "Future Requirements of Naval Vessels" by Hon. **George A. Sawyer**, assistant Secretary of the Navy, Shipbuilding and Logistics.

Session II — Thursday, April 7.

Theme — "Man/Machine Technology"

Moderators—Ronald M. Reese, Session II-A, and **Stuart W. Thayer**, Session II-B.

Paper No. II-A-1—"Recent Advances in Computer Graphics in the Shipyard Industry" by **J. Gude**.

SYNOPSIS: Computer-aided manufacturing (CAM) in shipbuilding started with the introduction of N/C flame-cutting equipment around 1960. Links between design, manufacturing and administrative computer functions are still few. Turnkey drafting systems now in use complement the CAM systems to some extent but faired lines from a CAM system cannot be transferred into a drafting system. Also, the detail design drawings generated by a drafting system cannot be used for automatic parts generation. This paper discusses the computer software used by the shipbuilding industry and areas in which work needs to be done to improve computer usage.

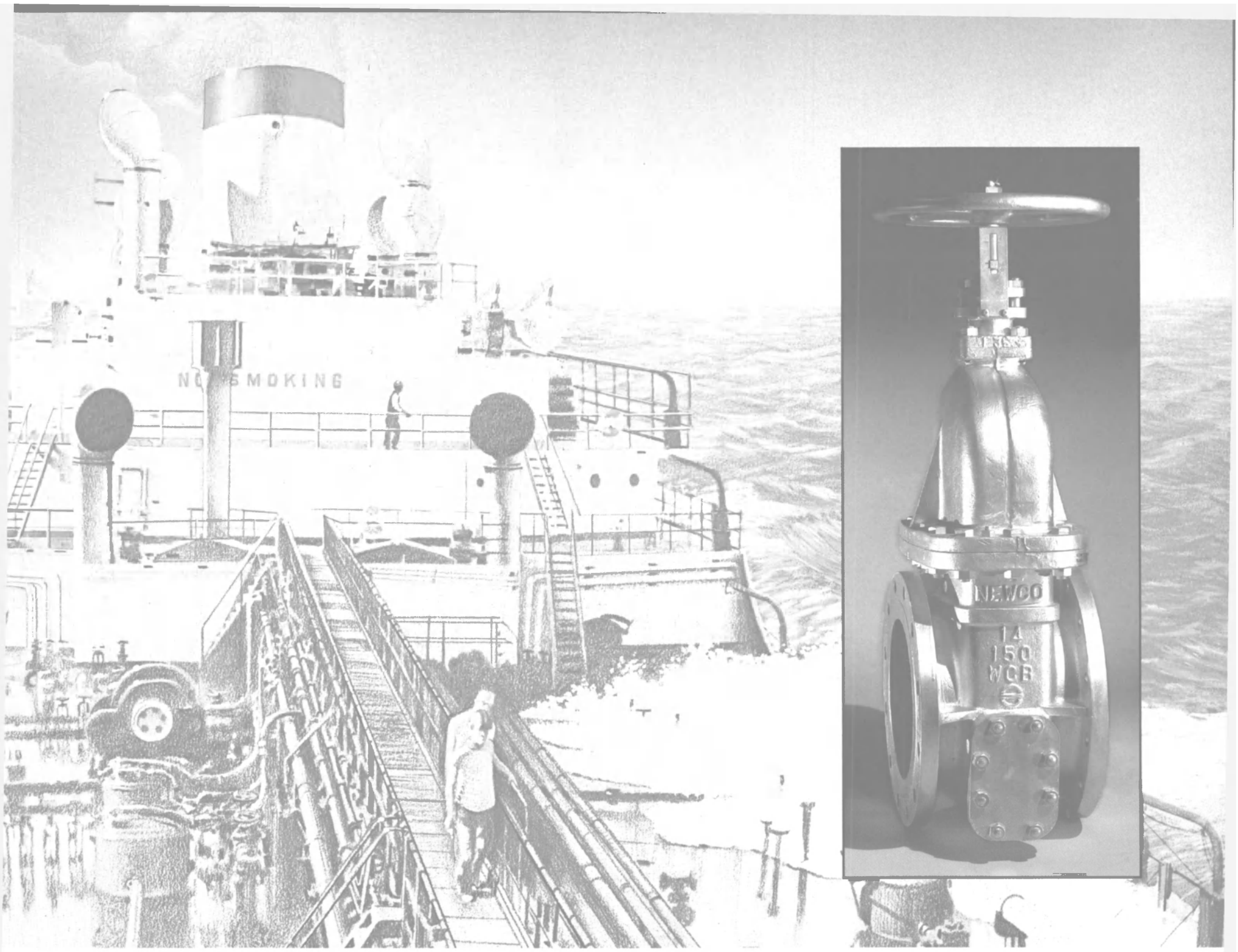
Paper No. II-B-1—"Recent Advances in Computer-Based Shipboard Maintenance and Operations Management Systems" by **N. Bassett** and **J. Rodgers**.

SYNOPSIS: This paper describes the development and installation of a shipboard computer system aboard a Great Lakes freighter, which performs maintenance and inventory control functions as well as crew payroll. System design criteria, program operation, and system implementation are discussed in addition to comments on crew acceptance.

Paper No. II-A-2—"Recent Advances in Ship Producibility Research" by **J. DeMartini**.

SYNOPSIS: Significant achievements produced by the two elements of the Ship Producibility Program, (1) the National Shipbuilding Standards Program (NSRP), and (2) the Shipbuilding Industrial Engineering Program are highlighted. As part of the National Shipbuilding Research Program, these two programs, organized under the SNAME Ship Production Committee, continue to contribute to the NSRP's goal of reduced shipbuilding costs and construction time and help to provide a sound

(continued on page 23)



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Whether it's new construction, retrofit, or routine replacement on everything from barges to the largest tankers, you can depend on Newmans and Newco marine valves to meet your total shipboard needs. And that includes modifications and hard-to-get speciality items. In fact, what's special to many may be standard for us and our distributors.

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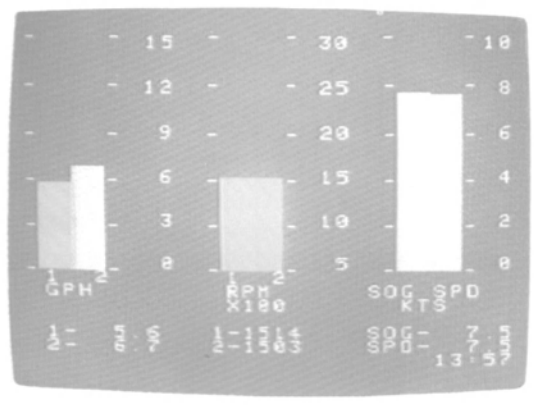

The first fuel-management display shows the fuel burn rate of engines 1 and 2 in gallons per hour, the rpm of each engine, and speed-over-the-bottom compared with speed-through-the-water.

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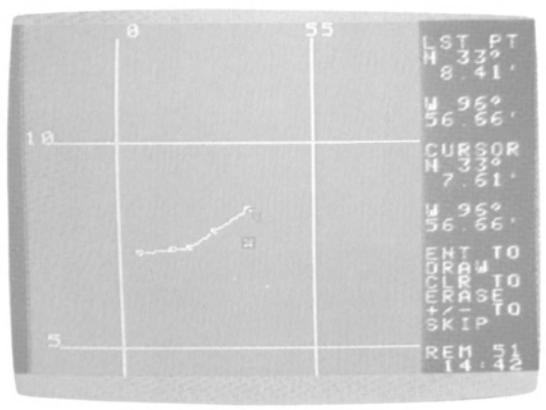
From helping you save fuel... to retracing a profitable fishing run... to alerting you to dangerous on-board conditions, the TI8000 provides the key to efficient vessel management.

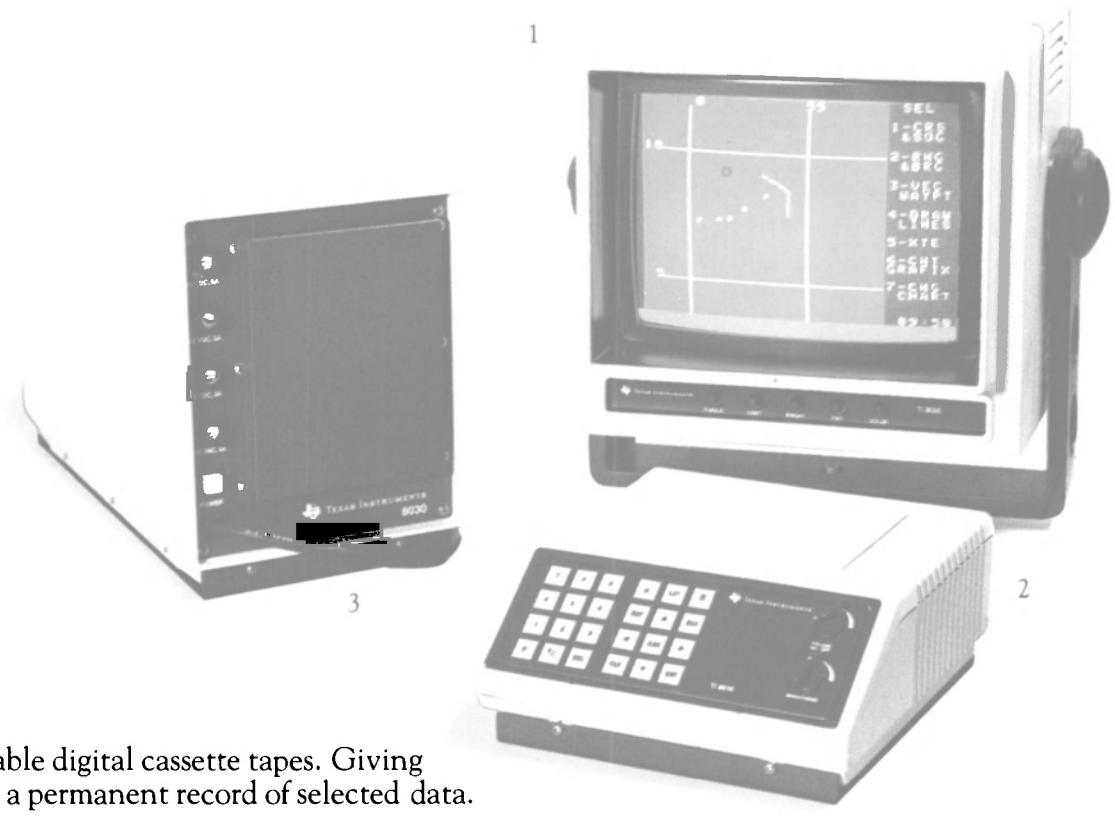
integrated marine system. vital data at your command.

At your command, the TI8000 displays gallons used per hour. Miles per gallon. Speed-over-the-bottom. Speed-through-the-water. Fuel supply remaining. And range and running time remaining at present speed.

By monitoring the fuel consumption of each engine, the TI8000 also gives you an easy way to detect and prevent costly engine troubles.



The navigation plotter uses Loran, Dead Reckoning, Transit Sat-Nav, etc., and displays and logs vessel progress.



Simplifies navigation

The TI8000 also provides a color navigation plotter to help you chart the best course. It simply uses your navigation source: Loran C, Transit Sat-Nav, Dead Reckoning, etc.

When you enter the coordinates of your destination waypoints, the TI8000 will display range, bearing, course-to-steer, and cross-track error.

You can input the waypoints for a complete trip, either manually or with a preprogrammed tape. A whopping 100 waypoints can be stored in the system's memory, with virtually an unlimited number of waypoints stored on digital cassette tapes.

By using previous trip data stored on the tape, the TI8000 will help you return to a location. Retrace a good fishing run. Follow a recorded channel. And avoid recorded navigational hazards.

Automatic ship's log saves time and effort

Another TI8000 feature: A state-of-the-art electronic ship's log. This handy feature lets you recall information about prior trips.

It automatically records time, present position, and other selected items on reliable digital cassette tapes. Giving you a permanent record of selected data.

Compact design saves space

The TI8000 does a lot, but takes up little space.

It consists of three space-saving modules. Information is compiled, recorded, and stored by the Computer Module. The keyboard of the Command Module lets you access this data, which is then presented on the Display Module. What could be simpler?

Rugged to take all the sea can dish out

Built tough by experts, the TI8000 is designed to give you years of dependable service—in the harshest marine environment.

Non-corroding aluminum and stainless steel parts help assure reliable performance. And greater durability results from the use of high-impact plastic for the case and cabinets.

Customized to your vessel

You and your TI dealer together define the sensor inputs, units of measure, vessel requirements, and more. Temperature alarms and many other sensors all can be selected for display and recording.

Equally important, the TI8000 grows with you. It can be expanded easily to meet your future needs.

Three compact modules make up the TI8000: 1) Display Module—the size of a 10-inch television; 2) Command Module—a keyboard and cassette tape deck unit; and 3) Computer Module—8 × 10½ × 16 inches.

Complete, affordable, and fully supported

At $9,995.00* plus installation, the value-packed TI8000 includes: Command Module, Display Module, Computer Module, heading reference, fuel flow sensors, and an event marker. The latter records vessel location data when pressed.

Fuel savings alone make the TI8000 a wise investment.

And you can rely on a specially trained, authorized TI dealer to install your TI8000. He is factory supported to provide you with installation, operating assistance, and service.

For more information, write Texas Instruments, Marine Products, P.O. Box 405, MS3438, Lewisville, Texas 75067.

Creating useful products and services for you.

TEXAS INSTRUMENTS

*Suggested retail price.

27-3859

Cybernet Handheld.
The personal 78-channel VHF.

You're in touch instantly, anywhere on the water, when your Cybernet handheld VHF-FM marine radiotelephone is on hand.

Whether you're in your tender, in a dinghy, working around your boat, or out in your day sailer. There's no installation hassle, no need to stop what you're doing to make or receive a call, and when you leave the boat your CTX-1078 leaves with you, clipped to your belt.

The Cybernet handheld offers you convenient, personal communication. In an emergency, when you absolutely can't leave the helm, or if you should ever have to abandon ship, it can be a lifesaver.

The CTX-1078 is a Cybernet, which means you get a full-feature frequency synthesized VHF-FM with all 78 U.S. and International channels including four weather channels, maximum RF output power exceeding 2.5 watts, in a sealed weatherproof case built to withstand the rigors of rugged marine use. Special features include quick-select channel 16, NiCad rechargeable battery, leather-grain vinyl case, belt clip and standard rubber duck antenna.

To get more information on the CTX-1078 and the name of your local dealer, write Cybernet International, Inc., 7 Powder Horn Drive, Warren, NJ 07060. To get in touch instantly, telephone (201) 560-0060.

Cybernet®

SNAME Spring Meeting

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foundation for the future of U.S. shipbuilding.

Paper No. II-B-2—"Recent Advances in Planning and Scheduling of Ocean-Borne Transportation" by **B. Douglas** and **K. Stott Jr.**

SYNOPSIS: The development and operation of a model-based decision-supported system for ocean-borne transportation are described. For the past several years, this interactive time-sharing system has provided two sets of functions in that: (1) it guides marine operations management in both annual planning and spot decisions; and (2) it assists operating personnel not only in conducting routine scheduling on a week-to-week, month-to-month basis throughout the year but also in making rapid adjustments for emerging opportunities and requirements.

Paper No. II-A-3 — "An Effective Approach to Structural Design for Production" by **C. Kuo, K. MacCullum** and **R. Shenoi**.

SYNOPSIS: The research outlined is concerned with the important question of design for production of ship structures. The main emphasis is placed on achieving effective interaction between design and production via the use of an appraisal procedure that incorporates producibility of design while quantifying the various production factors. A method of formulating an effective appraisal approach is outlined together with a production costing methodology.

Paper No. II-B-3 — "A New Approach in Automation and Electronics Maintenance for High Technology Vessels" by **R. Yerkes**.

SYNOPSIS: The rapid evolution of electronic and electro-mechanical control systems and communication equipment aboard modern cargo ships is causing a significant change in the way that operational maintenance is conducted aboard ship. The trend seems to be to automate communications functions, and to relieve the radio officer for general electronics maintenance duties, which in turn requires a more skilled, technically trained individual. This paper recounts the author's experience in recruiting and training electronics officers; his experience implementing an electronics officer program with the El Paso Marine Company, and some suggestions regarding future crewing, training and management to take full advantage of new information technologies and robotics in future ships.

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Paper No. II-A-4 — "Recent Advances in Energy Savings Achieved in Icebreaker Operations" by LCDR **D. Egan**, USCG.

SYNOPSIS: The apparent energy savings achieved with a new hull paint system on the CGC Northwind are discussed. CGS Northwind's primary mission requires long voyages to operating areas in the polar regions near Greenland and Antarctica. Because sustained operations are required from the nearest sources of support, fuel conservation is vitally important and directly relates to the ship's endurance to complete its mission and safely return home.

Paper No. II-B-4 — "National Defense Relevance of General Dry Cargo Carriers" by **A. Baki** and **J. Tandon**.

SYNOPSIS: There exists a rather evident hierarchy of missions

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for the U.S. merchant marine in time of war or national emergency. They are (1) military auxiliary, (2) defense resupply (3) security of economy, and (4) commerce. In times of peace, the reverse hierarchy applies to commercial ship operators. There is evidence that in the past this reversal of objectives did not create any significant divergence of requirements affecting vessel design. A number of changes have occurred in recent years which have resulted in a mismatch of design requirements for peacetime commercial and wartime national interests. This paper discusses these changes and recommends a methodology by which ships from the contract dry-cargo fleet can be selected for wartime use.

Paper No. II-A-5 — "Human Factors in Naval Ship Design" by **J. Castle, R. Feaga** and **A. Plato.**

SYNOPSIS: Reports by the General Accounting Office, the Naval Research Advisory Committee and Fleet Commanders have identified serious U.S. Navy Military Personnel problems which are affecting fleet readiness and operating costs. These problems and effects could worsen as the pool of skilled personnel available to the Navy decreases and as it expands to a 600-ship fleet. A primary cause of these problems is inadequate considerations of human factors in ship design. This paper discusses Navy personnel problems, design-related causes and what is being done to better address human factors in naval ship design.

Paper No. II-B-5—"Recent Advances in Underwater Surveys for Extension of Time Between Drydockings" by **F. Metanzo** and **J. Metcalf Jr.**

SYNOPSIS: Ships under the jurisdiction of the U.S. Coast Guard are required to have a drydock inspection every two years. Offshore oil rigs and bulk carriers have become so large that a biennial drydocking is a problem. This paper presents a survey of underwater technology as it applies to underwater inspection, maintenance and repair. It concludes that the capability exists to perform and encourages the Coast Guard to accept underwater inspection in lieu of drydock inspection on selected ships.

Paper No. II-A-6—"Recent Advances in Simulation — CAORF's Contribution to Maritime Industry Productivity — 1982" by **A. D'Amico, J. Puglisi, J. Schryver** and **H. Taylor.**

SYNOPSIS: As a part of the Maritime Administration's efforts to improve the safety and productivity of the U.S. maritime industry, the Computer Aided Operations Research Facility (CAORF) was designed to provide cost-effective solutions to problems involving vessel operation. CAORF has pursued a research program involving five areas of significant concern: (1) harbor and waterway analysis, (2) training and certification, (3) groundings and collision avoidance, (4) ship control and maneuverability, and (5) bridge system design. This paper summarizes three CAORF projects and techniques in the application of real time man-in-the-loop simulation in the solution of vessel operation problems of the maritime industry.

Paper No. II-B-6 — "Floating Industrial Plants — Business Going to Sea" by **W. Fink.**

SYNOPSIS: In an attempt to identify new construction opportunities for U.S. shipyards, the Research and Development organization of the Maritime Administration has recently completed

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work in industrial plant vessels, also referred to as floating factories, floating industrial plants, plant ships or factory ships. The market seems to be expanding steadily and new opportunities are occurring on a continuing basis. This paper reviews the MarAd program activities and recent events which may assist implementation of these concepts into the U.S. shipbuilding market.

Session III — Friday, April 8.
Theme — "New Directions"
Moderators—Wolfgang Reuter, Session III-A, and **Phillip Eisenberg,** Session III-B.

Paper No. III-A-1 — "New Directions for Navy Manufacturing and Shipbuilding Technology" by **R. Ramsay**.
SYNOPSIS: This paper provides a partial overview of naval and merchant shipbuilding industry problems. The planning approach for the Navy Manufacturing and Shipbuilding Technology (MT/ST) Program, which will support the expanded naval construction program, is outlined in concept. The relative importance of production technology, management strategy and business structure is discussed in context with approaches to resolution of current problems facing the U.S. shipbuilding industry.

Paper No. III-B-1—"New R&D Direction for the U.S. Merchant Marine" by **J. Gross**.
SYNOPSIS: The subject of new R&D directions for the merchant marine, poses several questions: (1) what is the future of the U.S. merchant marine, (2) what are its opportunities, (3) are the major problems that face the U.S. merchant marine solvable, (4) what is the role of research and development and innovation in the future merchant marine, and (5) what then should be the R&D directions for the U.S. maritime industry? In this paper, the author examines each of these questions and sets forth recommended R&D directions for improvement of the U.S. commercial maritime industry.

Paper No. III-A-2 — "New Directions for Advanced Naval Ship Design" by **N. Kobitz**.
SYNOPSIS: The need to develop a coherent method for incorporating into naval ship design the impact of changing roles and missions, threats and technology has long been a challenge to the design community. Over the past several years a method has been developed which addresses these needs. By combining several existing operations and adding some original concepts, a systematic approach to naval ship design and research requirement definition has been developed. It combines the mission work of the Office of the Chief of Naval Operations with the technology of the Naval Material Command to produce a continuous panel of ship alternatives from which the CNO can choose in formulating his shipbuilding program.

Paper No. III-B-2 — "The U.S. Coast Guard Advanced Marine Vehicle R&D Program: An Overview" by **J. Milton** and LCDR **J. Tozzi,** USCG.
SYNOPSIS: Since its inception, the U.S. Coast Guard Advanced Marine Vehicle (AMV) R&D program has been directed at the application of AMVs to the Coast Guard's operational missions. The primary objective of the AMV R&D program has been to quantify the cost-benefit trade-offs of using AMVs to perform Coast Guard operational missions. The approach has been to conduct operations analyses in conjunction with literature reviews and operational and technical evaluations of specific vehicles. At present, some of the operations' research tools which have been developed are being applied to support the upcoming replacement of seventy-six 95-foot and 82-foot patrol boats. In the future, these tools may be refined and updated to support other vessel acquisitions.

Panel Discussion — "New Directions for Education to Support Ship Design and Construction."

Moderator—Wolfgang Reuter, executive vice president, Designer and Planners, Inc.

Panel Members:

Vice Adm. **C.R. Bryan,** USN (ret.), president, Webb Institute

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of Naval Architecture: "Naval Architecture Academic Community."

Howard M. Bunch, associate professor of naval architecture, University of Michigan: "Ship Production Management and Technology."

William M. Ellsworth, head, Systems Development Department, David W. Taylor Naval Ship Research and Development Center: "Ship Design and Technology R&D Management."

John R. Lindgren Jr., vice president of engineering, Ingalls Shipbuilding Division: "Shipyard Engineering Management."

Koichi Masubuchi, professor of ocean engineering and material science, Massachusetts Institute of Technology: "Welding and Ship Production Engineering Technology."

Ellsworth L. Peterson, president, Peterson Builders, Inc.: "Shipyard Management."

Student: to be selected.

Panel Discussion — "New Directions for Offshore Development."

Moderator: Phillip Eisenberg, past president, SNAME.

Panel Members:

John E. Halkyard, president, John E. Halkyard and Co.: "Ocean Mining."

James A. Rickard, planning manager, Exxon Production Research Co.: "Oil and Gas Extraction Research Co."

D. Lee Alverson, Natural Resources Consultant: "Living Resources Consultant."

Robert H. Douglas, project manager, Tactical Systems, TRW, Inc.: "Ocean Energy."

John E. Flipse, professor of ocean engineering, Texas A&M University: "Effects of Law of the Sea Treaty."

Social Activities

Early Bird Reception — For those early arrivals who wish to meet old friends and make new ones, a reception will be held on Tuesday, April 5, in the Lafayette Room.

Orientation Breakfast, April 6: Welcoming breakfast with brief program orientation and description of the social programs and tours.

Authors / Moderators Breakfast, each day: Authors and moderators for the day's technical sessions will have a chance to meet each other and review the meeting schedules.

President's Reception, April 6: Participants will travel by motorcoach to the Navy Memorial Museum at the Washington Navy Yard where Society President **C.L. French** will receive all registrants.

President's Luncheon, April 7: This luncheon will feature the presentation of several important awards and an address by Society President **C.L. French.**

Evening at the Kennedy Center, April 7: This event will start with transportation by motorcoach to the John F. Kennedy Center for the Performing Arts. Attendees will walk through the Hall of Nations, view the Kennedy bust, and proceed to a reception and private buffet supper in the Atrium Lounge. After supper, they will go to the Opera House for a performance of "Dance a Little Closer."

Potomac Cruise, April 8: This closing event includes a private Potomac River cruise to Mount Vernon aboard the M/V Diplomat. Music will be provided, as will a box luncheon. At Mount Vernon a tour of George Washington's home and the gardens will be held. The return trip will feature more music and dancing plus a dessert buffet.

Special Tours: A tour will be provided for spouses and guests on April 6 to the Diplomatic Reception Rooms of the Department of State and the U.S. Capitol Building; lunch will be served at the Marbury House in Georgetown, followed by a visit to Dumbarton Oaks. On April 7 a special tour is provided to Alexandria, Va. This tour will be preceded by a tour of the White House for those who desire to see the Presidential Home.

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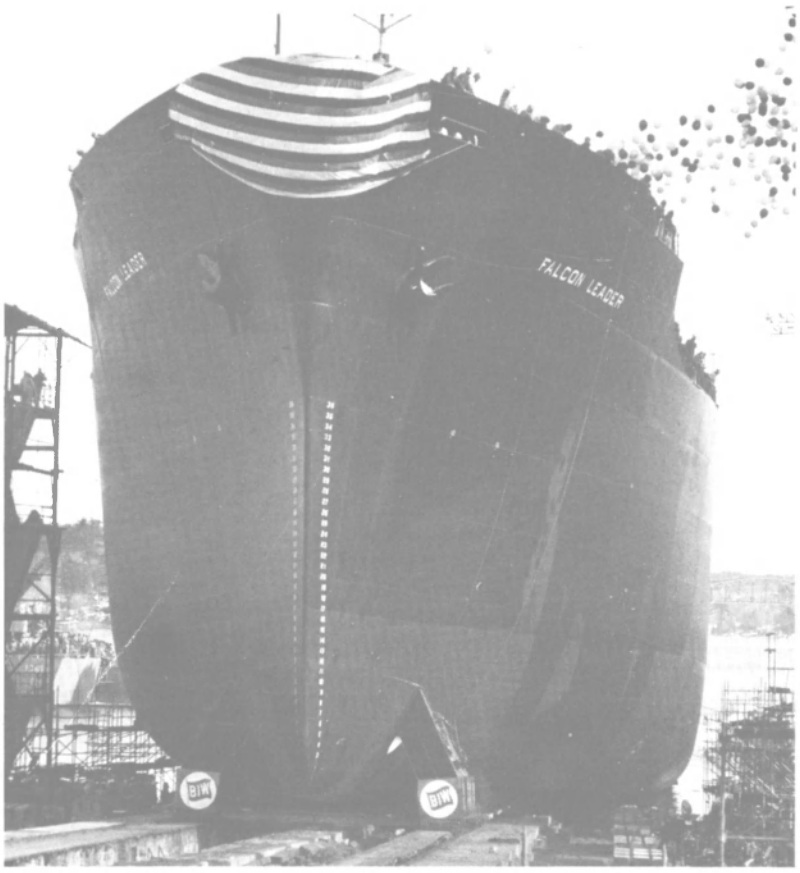

The Falcon Leader is launched at Bath Iron Works.

Bath Iron Works Launches First Of Two 33,800-DWT Tankers

Vice Adm. **Kent J. Carroll**, Commander of the U.S. Military Sealift Command, was the principal speaker at the recent launching at Bath Iron Works of the Falcon Leader, a 666-foot oil tanker.

John F. Sullivan Jr., chief executive officer and chairman of BIW, invited the public to attend the launching ceremony. **Mrs. Betty M. Carroll**, wife of the principal speaker, christened the vessel, the first to be launched by BIW in 1983. Their daughter, **Deborah**, was maid of honor.

BIW constructed the 33,800-dwt Falcon Leader for Falcon One Sea Transport of Houston, Texas, but the vessel, as well as a sistership, Falcon Champion, to be launched later this year, will be chartered by the Military Sealift Command for five years with options for up to five additional years.

Robert J. Blackwell, former Assistant Secretary for Maritime Affairs for the U.S. Department of Commerce, also spoke at the launching ceremony.

The Falcon Leader is the first commercial ship built by BIW since it delivered the containership S/S Resolute in February of 1980. The modern tanker, featuring advanced environmental and safety systems, will displace 34,500 tons fully loaded and will have a carrying capacity of 225,000 barrels.

The Port Authority's new survey boat from Thomas Marine, Inc. is powered by a Perkins 85-hp diesel engine.

Thomas Marine Delivers 24-Foot Survey Boat To N.Y.-N.J. Port Authority

Thomas Marine, Inc. of Patchogue, N.Y., recently delivered a 24-foot survey boat to the Port Authority of New York and New Jersey.

The boat will be used to survey ship slips, take soundings, and monitor dredging operations in the N.Y.-N.J. harbor. Designed by Thomas Marine, Inc., the boat is powered by a Perkins model 4-236, 85-hp diesel engine driving a three-blade Federal propeller through a Borg-Warner gear. The boat has a 12-knot cruise speed and a 14-knot dash speed.

The vessel is equipped with through-hull transducer wells, tow bitts, lifting eyes, cabin heater and defroster, a full keel and shoe to protect the propeller, Thomas Marine-built keel coolers, and a dry exhaust system. It is designed for winter and summer use.

Construction of the 24-foot, by 9-foot, by 28-inch vessel is of 3/16-inch heli-arc welded aluminum plate. The decks are of 3/16-inch aluminum plate, and the rudder and shoe are one-inch plate.

SURVEY BOAT
Major Suppliers

Main Propulsion	Perkins
Reduction Gears	Borg-Warner
Propellers	Federal
Shaft	Armco
Bearings	Johnson Duramax
Panels	Kes
Engine Controls	Morse
Steering	Hynautic Hydraulic
Depth Sounder	Raytheon
Coatings	International Paint

Doran-Alabama Offers Free Brochure On Propellers And Repair Services

Doran-Alabama Propeller Company of Mobile, Ala. has published an eight-page full-color brochure describing its complete propeller manufacturing and repair capabilities.

Doran-Alabama Propeller, in business since 1950, offers all boat and shipowners a full line of knowledge from repairs to engineering, with 32,000 square feet of production area fully equipped to serve the industry.

The brochure also describes the firm's four main propeller types for towboats, workboats and deep-water fishing boats. It includes photos of the propellers and specification charts for each.

For a free copy of the brochure,

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The Point Liberty is powered by two EMD engines.

Halter Marine Delivers The Point Liberty To Point Express

Halter Marine, Inc., of New Orleans, La., recently delivered the Point Liberty, the third of four 191-foot tug/supply boats to Point Express, Ltd., of Morgan City, La.

The Point Liberty is 191-feet long with a 40-foot beam and a 14-foot depth. She is powered by two EMD 16-645C diesel engines developing 1,950 hp each at 900 rpm. They drive two, 90-inch-diameter four-bladed propellers through Lufkin RHS 2120 reverse/reduction gears with a ratio of 3.0:1.

The vessel's six Smatco tanks each carry 1,000 cubic feet of bulk mud and four additional tanks carry 1,344 barrels of liquid mud. Dry mud is moved through the system by a Gardner Denver WCG air compressor and liquid muds are pumped by Mission Magnum pumps.

Some of the Point Liberty's other capacities are: 61,000 gallons of fuel oil; 1,824 gallons lube oil; 165,400 gallons ballast water; and, 16,888 gallons of fresh water. Her aft deck has nearly 4,000 square feet of cargo space.

There are two Westinghouse equipped control stations aboard and a 56-point engine alarm system provided by EMI. The hydraulic steering system was manufactured by SSI. The vessel's maneuverability is enhanced by a Bird-Johnson model 20 bow-thruster driven by a Detroit Diesel 8V71 diesel engine through Capitol reverse/reduction gears. The main switchboard and distribution panels were built by Continental Electric.

Auxiliary power is supplied by two Detroit Diesel 8V71-N diesel engines generating 125 kw. Two Quincy model D325 air compressors provide compressed air for diesel engine starting, the pneumatic control system, air whistle, sea chest, and ship service.

Aurora pumps service bilge, ballast, fuel transfer, and the on-ship fire-fighting system while Viking pumps handle oily bilge and fuel oil standby. The fuel oil separator model OTB-2-00-066 was manufactured by Westfalia and supplied by Marine Engineering, Inc., of Belle Chase, La. The sanitary water system contains a Deming pressure set with a vertical 82 gallon tank. Water closets drain into a Microphor MC-200 sewage treatment system.

Satellite navigation is provided by a Magnavox MX4102 direction finder with interface to a Sperry gyrocompass. The VHF radio is a Sailor RT-144 and the SSB radio is a Stevens SEA 106-1. Two Raytheon model 6425-

POINT LIBERTY
Major Suppliers

Main Propulsion	(2) EMD
Reduction Gears	Lufkin
Generator Engines	(2) Detroit Diesel
Panels	Continental Electric
Engine Controls	Westinghouse
Engine Monitors	EMI
Steering	SSI
Bow Thruster	Bird-Johnson
Thruster Engines	Detroit Diesel
Separator	Westfalia
Pumps	Aurora, Viking
Air Compressors	Quincy
Sanitation system	Microphor
Radars	(2) Raytheon
CAS	Raytheon
SSB	Stevens
VHF	Sailor
Rudder Angle Indicator	Henchel
Depth Sounder	Raytheon
SATNAV	Magnavox
Gyrocompass	Sperry
Winch	Smatco
Stern Roller	Smatco
Windlass	HBL
Cargo Tanks	Smatco
Cargo Pumps	Mission Magnum
Cargo Compressor	Gardner-Denver

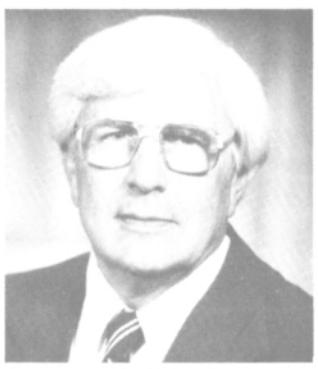
◄ Write 76 on Reader Service Card

6UP radars are installed. The starboard radar has a Raytheon IBCAS anti-collision unit. The vessel is also equipped with a Raytheon depth sounder, Henchel rudder angle indicators, and a Henchel intercom.

Some of the deck equipment includes a Smatco 66 DAW 200 towing winch, a 5-foot by 8-foot Smatco stern roller, and an HBL electrohydraulic anchor windlass. Seven staterooms provide berths for 20 persons.

The Point Liberty is American Bureau of Shipping classed A1, Maltese Cross, full ocean towing, AMS, ice class "C", and carries a Panama Canal admeasurement certificate. She was built at Halter's Lockport, La., division which will soon complete her sister ship, the Point Normandy. Two sister ships, the Point Bravo and Point Chaleur (see MR/EN Feb. 15, 1983), have already been delivered.

CRC Names Jack Webb VP Of Engineering



Jack Webb

CRC Pipeline Equipment of Houston, Texas, has appointed **Jack Webb** as vice president-engineering. The announcement was made by **Wyn Norris** president. Mr. **Webb**, formerly engineering manager, will have the responsibility for engineering of all pipeline equipment and welding products manufactured at the company's Tulsa, Okla., facility.

CRC Pipeline Equipment is a division of the Houston-based Crutcher Resources Corporation and engages in the manufacture, sales and service of specialized pipeline construction equipment.

Shell U.K. Orders 10 Plath Load Monitor Computers —Literature Offered

C. Plath of Hamburg, West Germany, recently received an order from Shell U.K. for 10 of its recently introduced load monitoring computers, the LMC 2000.

The equipment will be installed on two new LPG carriers and eight tankers currently in service. The LMC 2000 can operate on-line or in the off-line mode, and also be used as a general purpose computer. For more information on the LMC 2000,

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Salwico Offers Literature On Sal-Glas Protective Primerless Marine Coatings

Sal-Glas protective coatings are now available from Salwico Glassflake, Inc., Hoboken, N.J., for use wherever corrosion, abrasion, and chemical resistance are required. Needing no primer, Sal-Glas can be applied by brush, trowel, or airless spray rig on most metal, concrete, fiberglass, and wood surfaces, including the internals and externals of pumps, piping and valves. Technical service and application equipment are available.

Salwico literature describes Sal-Glas as consisting of 100 percent solid polyester or vinyl resins with inert glass flakes. Two coats yield a 30 to 40 mil. seamless monolithic lining with over 150 layers of micron-thick glass flakes. Designed for maximum protection in marine environments, Sal-Glas linings have wide use in other marine industries and applications, including power, chemicals, waste water, and sewage treatment, desalination, fertilizers, metal refining and finishing, pulp and paper, steel, textiles, food and beverages, and transportation.

For a free copy of Sal-Glas literature,

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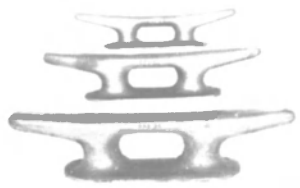
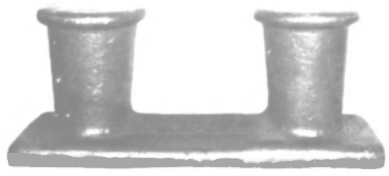
NEW CHOCKS - CLEATS - BITTS
CAST STEEL

OPEN CHOCKS

Overall length 2' 3¾" — top opening 6" — width 9"

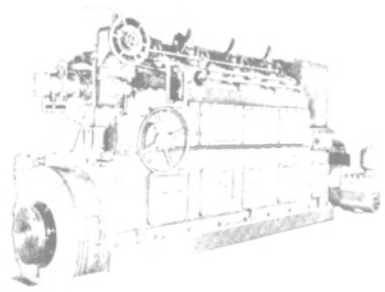


36" - 42" - 48" KEVEL CLEATS



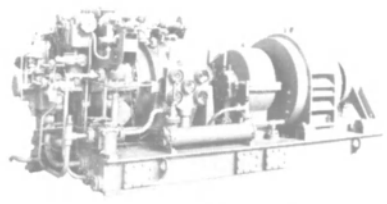
10" DOUBLE POLE BITTS

NEW CLARK 500BHP DIESEL
4-CYL. — AIR STARTING



500 BHP @ 400 RPM. 4-Cylinder straight inline type — 12½" X 16" — 2-stroke single acting — liquid cooled — direct reversible — CW rotation. With standard shaft-connected starting air compressor. 46,000 lbs., net weight—228" long—98" wide—132" high. Designed for heavy duty, rugged use, its extreme simplicity will result in lower operating and maintenance costs.

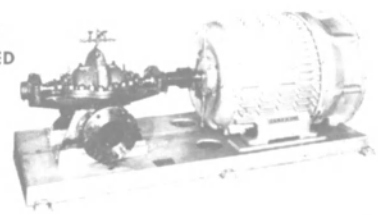
LOW PRESSURE 450 KW
A.C. TURBO GENERATORS
suitable for waste heat
turbo generators on motor ships



For motorship service. 175 PSIG — D&S — 27½" vacuum. GENERATOR: Westinghouse 450 KW — 563 KVA — 450/3/60 — 1200 RPM. GEAR: 6097/1200 RPM. TURBINE: 175 lbs/D&S — 27½" vacuum. Other pressures & temps: 250 lbs @ 40°C — 27½" vacuum. Turbine serial #7801-7802. OAL 13' 1 3/16" — OAH 5' — OAW 5' 3/8". Total dry wt. 17,100 lbs. Plans on request.

NEW 5" ALL BRONZE BALDWIN-LIMA
1000 GPM 150 PSI TOTAL HEAD
CENTRIFUGAL FIRE PUMP

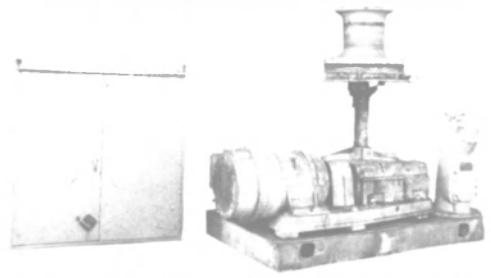
NEW UNUSED



EX U.S.N.

Single stage double suction type with 6" side suction & 5" side discharge. 3600 RPM—test pressure 250 PSIG. MOTOR: Reliance 125 HP 440/3/60—totally enclosed—fan cooled—Frame D-5003-S—50°C.

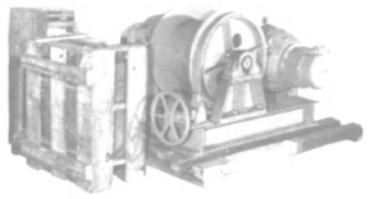
30 HP—440/3/60—2-SPEED A.C.
MOTOR-DRIVEN CAPSTAN



8500 lbs @ 90 FPM or 4250 lbs @ 180 FPM. Barrel size 15". Below-deck mounted motor — 31 HP — 440/3/60 — 42/38 amps — 820/1200 RPM. Squirrel cage — totally enclosed — watertight. Half hour duty 65°C. temp. rise. Base OAL 6'4". With magnetic brake, 2-speed control and master switch.

GENERAL PURPOSE WINCH
3500 LBS AT 200 FPM

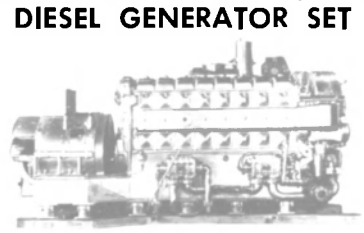
NEW UNUSED



EX U.S.N.

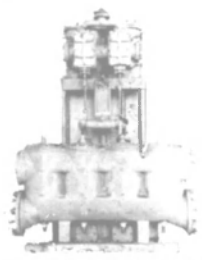
A.C. Motor drive—25/12.5 HP—GE 440/3/60—40°C AB —1750 RPM—type KR—full load amps 32. Motor drives winch through Falk reduction gear. Has compressor hand brake.

300KW GM 8-268A 120/240 DC
DIESEL GENERATOR SET



ENGINE: GM 8-268A — 6 1/2x7 — 1200 RPM. Heat exchanger cooled — equipped with heavy duty coolers. Just overhauled and can be seen running. Good condition.
Length Width Height Weight.
IMMEDIATE DELIVERY

WORTHINGTON 16" X 14" X 18"
VERTICAL DUPLEX STRIPPING PUMP



1400 GPM @ 110 PSI — suction lift 11.5 ft. — steam back pressure 15 lbs. 14" Suction —10" discharge — 2½" steam — 4" exhaust. Overall width 6'8" — overall height 9'1½" — depth 3'9½". Wt. approx. 10,000 lbs.

RECONDITIONED 1980
ABS — READY TO GO

NEW U.S. MARAD-TYPE
AXIAL FLOW FANS

(3) 10,500 CFM Model AF-100, "Baldor" 5 HP motor — 440/3/60 — 40° — 1750 RPM — 7 amps.

(2) 40,665 CFM — size 43AF — 60 HP Baldor Motor — 440/3/60 — 1760 RPM — 75 amps — 50° rise — Frame 364TZ Ins. F

NEW NAVY 12,000 CFM
EXPLOSION PROOF
AXIAL FLOW FANS

Model A12A4X6 with 10/3 HP 2 speed motor.

MARINE VALVES... mos

all carefully removed from Exxon Tank

GATE VALVES – GLOBE VAI

MOST WITH

BIG SAVING

GATE VALVES

150 LBS.

16"	14"
12"	8"
6"	5"
4"	3"

ANGLE VA

150

16"
8"
4"

On globe valves and angle valves, we v

DUCTILE IRON & (

O.S.Y. RISING STEM OR NON·

VACREL PRESSURE RELIEF
6" ALL BRONZE

FIG. 120

Atmospheric venting—3.0 PSI max. relief setting. Pressure only. Flanged connection. Approx. wt. 140 lbs.

$1195 Reconditioned

FIG.

Closed ven lifting gea connection. settings: 3.(sure—1.0 P! Approx. wt

$1195 Rec

BRONZE BA

BRONZE HORIZONTAL
10HLV INGERSOLL-RAND
CARGO PUMP

Ingersoll-Rand 10HLV — 14"x10". Bunker Fuel: 5150 GPM — 370' head — 1885 RPM. Sea Water: 6000 GPM — 352' head — 1885 RPM. Reduction Gears: G.E. type S-233 — Form AE — 700 HP — 6002/1685 RPM. TURBINE: G.E. D.P. 25 Class 4 — 700 HP — 6002 RPM — PSIG 775 lbs — 825 — inlet temp. 560° - 600° max. Exhaust pressure 179" Hg absolute.

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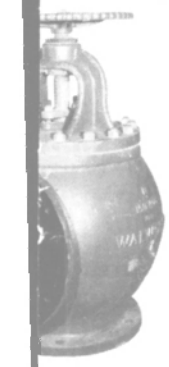
with Teflon lined seats

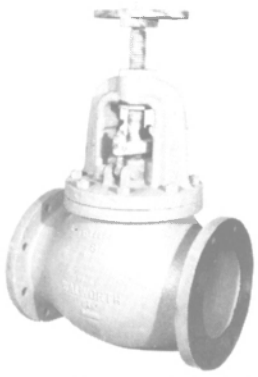
rs when they increased cargo line sizes

'ES – ANGLE GLOBE VALVES

CLEANOUTS



PRICED RIGHT



GLOBE VES

LBS.

12″
6″
3″

GLOBE VALVES

150 LBS.

14″	12″
8″	6″
5″	4″
3″	

ill clean and water test at additional cost

CAST STEEL 150 LBS

RISING STEM WITH INDICATOR

VALVES

130
ing. With Flanged
lax. relief PSI Pres-
Vacuum.
285 lbs.
ditioned

ASK FOR PRICES ON RECONDITIONED VALVES

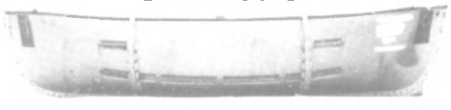
RELIEF VALVES

8″
6″
6″ ANGLE
2″

LAST PUMPS

Allis-Chalmers Model 402-432-501—12″x10″—6000 GPM — 180′ head — 1225 RPM. Impeller diameter 19.75″. TURBINE: GE Model 7DTPY125MR93 — 340 HP — 5000 RPM. Steam pressure 775# — 835# max. — temp. 530° TT—600° max.—exhaust 53 PSIG. REDUCTION GEAR: Type S-233 Form AR — 340 HP — 4997/1225 RPM. Also Worthington Model 8LN-18—12″ x 8″—1775 RPM—280′ head.

2 FIBERGLASS 52 PERSON DIESEL POWERED LIFEBOATS



Built in Norway to Norwegian Veritas. 26′ Long—8.33′ beam—3.74′ depth. Distance between hooks on release gear 21′ 9½″. Tanks filled with polyurethane. ENGINES: SAAD 16HP diesels—air-cooled—type GA—with reversible pitch propeller. Boats built by Bjorke-Batbyggeri, Rosendal, Norway. For tanker use. Serial #2313 and #2314. Typical Lifeboat illustrated.

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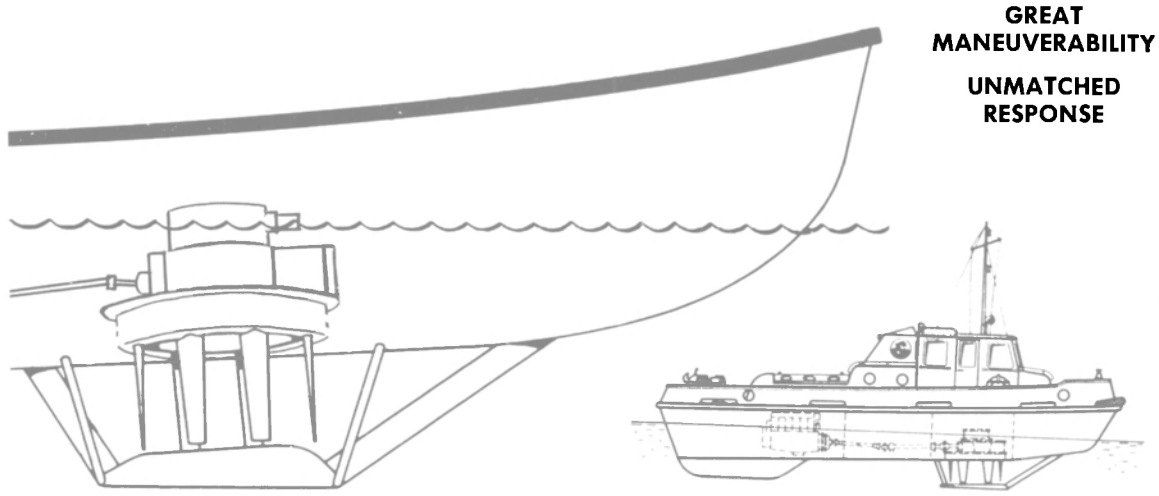
CYCLOIDAL CONTRA-ROTATING OMNI-DIRECTIONAL PROPELLERS

**Can Be Located Side-By-Side, Fore and Aft,
For Fast and Precise Movement Sideways and 360°
On Axis Turns Make Them Ideal for Tugs, Ferries, Cranes, Etc.**

GREAT MANEUVERABILITY

UNMATCHED RESPONSE



Serial Nos. NR-1783 and NR-1784. Unit size 24/E150. 6 Stainless steel blades each unit — 1500mm blade length — 2400mm blade orbit diameter. PRESENT DRIVE with Voith AD40 reduction gears and heavy duty motor 800/1000 HP — 440/3/60 — 1775 RPM — squirrel cage — 884 amps — frame 23153. Mfg. by Electric Machinery Co. Complete with "Cage Controls" & motor controls. Size 8 — Control volts 120 A.C. — line volts 450 — amps 941/3/60 OR DRIVE DIRECTLY WITH DIESEL ENGINE AND HYDRAULIC COUPLING ARRANGEMENT. UNIT BUILT 1970. COMPLETE WITH HYDRAULIC SERVO MOTORS FOR BRIDGE CONTROL AND 5 SPARE BLADES.

24″ I.D. MAN-WAY 3-DOG HATCHES

18″ Coaming. Available with T socket wrench or removable handwheel (can be welded in place) for top opening. Spring-loaded lid w/inside handwheel. Coaming 12mm thick, top 11mm. Bosmet drawing #67/56

20″ ROUND HATCH

18″ Coaming — 3 brass dog drop bolts. Coaming 12mm thick — top 11mm. Bosmet #68

QUICK-ACTING 4-DOG HATCHES

Heavily constructed. Handwheel operated. Handwheels top & bottom. Size A: 27″ x 21″ w/12mm coaming & 11mm top. Size B: 31″ x 31″ w/12″ coaming. For ocean-going barges, tugs, etc.

IMMEDIATE DELIVERY

TANKER EXPANSION TRUNK

36″ Diameter — 26″ coaming — 7-Dog drop-bolts. Drawing #36/26

CARGO HATCHES

72″ x 74″ x 12″ 48″ x 48″ x 9″

QUICK-OPENING HATCH

Handwheel top & bottom. 4 Dogs. 16″ x 24″ with 5″ coaming. Drawing #60-40

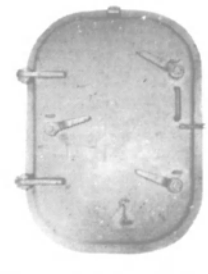
21″ I.D. MAN-WAY 3-DOG HATCHES

10″ Coaming. Available with T socket wrench or removable handwheel (can be welded in place) for top opening. Coaming 12mm thick, top 11mm. Bosmet #64/55

FLUSH HATCHES

24″ x 30″ 30″ x 30″

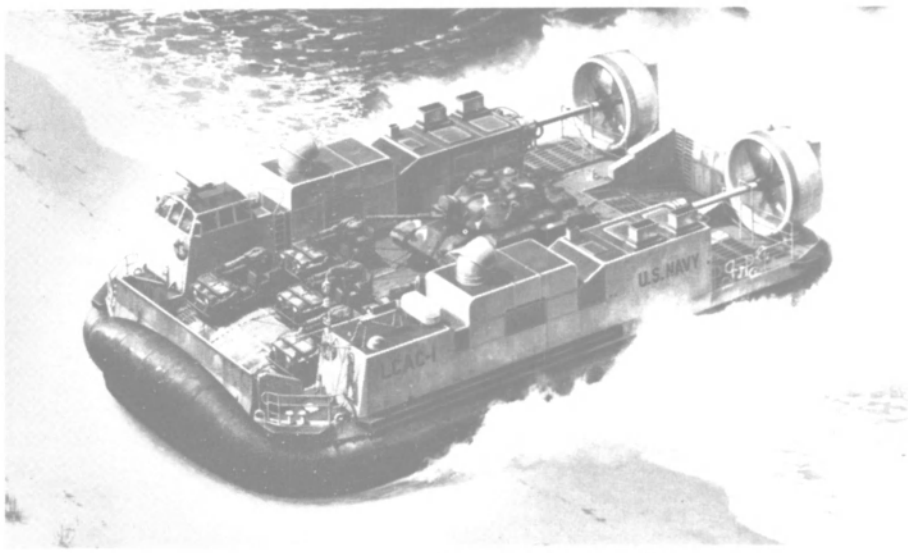
4 Dogs bottom — T-key top opener. 4″ Maximum coaming. Coaming 8mm thick — top 7mm.



WATERTIGHT DOORS

24″ x 36″ — 3-DOG

Right & Left Hand



Artist's rendering of the Bell Halter LCAC.

Bell Halter Begins Production Of First LCAC For Amphibious Forces

Bell Aerospace Textron, division of Textron, Inc., has started production of the first hull assembly for the new U.S. Navy amphibious landing craft. The event was marked by a recent ceremony in New Orleans, La. The Landing Craft, Air Cushion (LCAC) is being built at the Bell Halter Inc. shipyard in eastern New Orleans, where the ceremony was held. Bell Halter Inc. is a company formed by Bell Aerospace Textron and Halter Marine, Inc.

Assistant Secretary of the Navy (Shipbuilding and Logistics) **George A. Sawyer** spoke at the ceremony and described the LCACs as the greatest advance in amphibious warfare since World War II, and the first significant improvement in landing craft design since the 1930s. The ceremony was attended by conferees at the 7th Marine Systems Conference.

The LCAC is an amphibious air cushion vehicle that can travel at speeds up to 50 knots and can quickly transport troops, equipment, and weapons from support ships over the horizon to dry ground beyond the beach and surf.

With strong support from Congress, the Navy has signed contracts with Bell to fabricate six LCACs. Ultimate purchase of 100 or more LCACs is planned. With Bell providing quality LCACs on time and within cost, the Navy plans to introduce the amphibious vessels into the fleet in 1986.

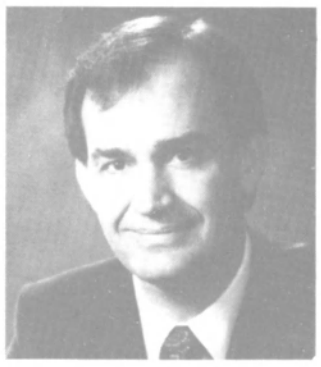
The LCACs will increase the world shorelines suitable for landing by U.S. troops by a factor of four. The LCACs can be carried in existing U.S. Navy assault ships as well as new ships under construction.

$15.8-Million Contract For Floating Drydock Mooring Facility Awarded Maecon

Maecon Incorporated, Irvine, Calif., has been awarded a $15,824,000 fixed-price contract for the construction of a floating drydock mooring facility at Naval Station, San Diego. The Naval Facilities Engineering Command, Washington, D.C., is the contracting activity (N62474-81-C-8263).

Dravo Mechling Announces Management Changes In Southern Operations

Dravo Mechling, the barge line subsidiary of Dravo Corporation, recently announced a series of management changes related to its operations in the New Orleans-Baton Rouge, La., area.



Tom Terrell

Tom Terrell has been appointed manager, Southern operations. Located at Dravo Mechling's facility in Kenner, La., he will be responsible for all operations and personnel in the Baton Rouge and New Orleans areas as well as operations east and west on the Intracoastal Canal. Mr. **Terrell** joined Dravo Mechling in 1981 as operations coordinator in New Orleans.

Reporting to Mr. **Terrell** will be **Phil Payton**. In addition to his current responsibilities as superintendent of barge repair and fleeting in New Orleans, Mr. **Payton** will assist Mr. **Terrell** in overseeing Dravo Mechling's Southern operations.

Bill Martyn has been named fleet superintendent, Baton Rouge. In that capacity he will be responsible for all fleet operations in the Baton Rouge area. Prior to this appointment, Mr. **Martyn** was commodity manager, grain, in Dravo Mechling's Pittsburgh office.

Loyd Murphy has been named barge repair and maintenance superintendent, Baton Rouge. His responsibilities will include all repair and maintenance activities and related personnel and inventories in the Baton Rouge area.

St. Louis Ship Appoints Stork Services As FAST Agency In Five Countries

St. Louis Ship, of St. Louis, Mo., recently announced the appointment of Stork Services b.v., Hengelo, The Netherlands, as the sales and service agency for FAST sewage systems in France, Belgium, Holland, Italy, and Germany.

Stork Services joins 16 other agencies and distributors around the globe providing local support for FAST marine and offshore sewage treatment systems.

For more information on FAST systems,

Write 63 on Reader Service Card

American Waterways Shipyard Conference Officers Elected

The American Waterways Shipyard Conference met recently in New Orleans, La., and unanimously elected officers for the coming year.

Elected were: chairman—**Robert W. Greene**, president and chief executive officer, Jeffboat, Inc., Jeffersonville, Ind., and vice chairman—**Neal S. Platzer**, president, Platzer Shipyard, Inc., Houston, Texas. Shipyard Steering Committee members elected for three-year terms expiring in 1986 were: **Robert W. Greene**, Jeffboat, Inc., Jeffersonville; **Robert Burke**, Union Dry Dock and Repair Co., Weehawken, N.J.; and **Walter W. Rody**, Port Allen Marine Service, Inc., Port Allen, La.

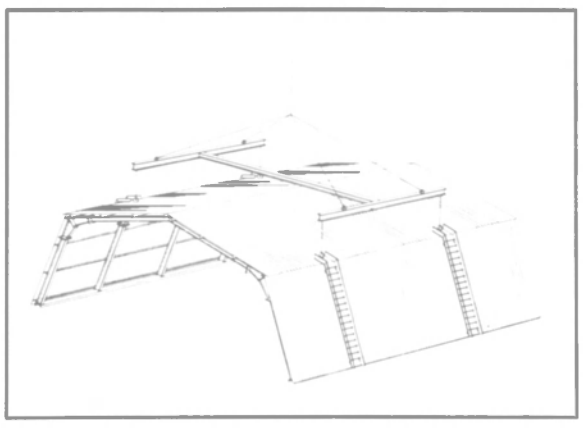
Shipyard Steering Committee members elected for two-year terms expiring in 1985 were: **Edward Renshaw**, St. Louis Ship, St. Louis, Mo.; and **Jack Miller**, Dravo Corporation, Pittsburgh, Pa. They join the following Steering Committee members — terms expiring in 1984: **George Fergert**, Gretna Machine & Iron Works, Inc., Harvey, La.; **Robert Kenny**, HBC Barge, Inc., Brownsville, Pa.; and **Daniel J. Larsen**, Duwamish Shipyard, Inc., Seattle, Wash. Term expiring in 1985 — **Neal S. Platzer**, Platzer Shipyard, Inc., Houston, Texas.

Swiss Fabricating Introduces Standard "Flyable" Buildings —Literature Offered

Drawing on experience that has placed relocatable buildings from coast to coast, Swiss Fabricating of Pittsburgh has brought out a standard set. The company is now offering free literature describing their convenient, cost-saving structures.

Designed for quick placement by contractors and shipyards, these rigid, light structures permit fast, easy, low-cost location or relocation exactly where needed by crane.

The new standard Swiss structures are available at 50 feet by 40 feet and 42 feet by 40 feet. Both are built to 19-foot clearance at the eave. Building ends can be left opened or closed with doors and windows to specification.



Swiss Fabricating relocatable structure.

Footers or floors are not required. The four access ladders are supplied as illustrated.

For copies of the free literature,

Write 53 on Reader Service Card

Houston Systems Completes Custom Work On 4 New Rigs

Houston Systems Manufacturing Company, Houston, Texas, has completed the fabrication and rig-up of a workover/drilling platform rig for the Hercules Offshore Drilling Company, two trailerized desert rigs for USS Oilwell Supply and one mobile workover rig for Cooper Manufacturing Company. Each rig was a custom job and has been rigged-up to meet unique working conditions.

Hercules Workover/Drilling Platform Rig.

The Hercules rig was built by HSMC/Rig-Up Services for operation on limited space platforms in the Gulf of Mexico. Utilizing a HSMC 450,000-pound telescoping mast and 1,000-hp Gardner Denver drawworks, the rig is designed for a working depth of 12,000 feet and to breakdown into 20,000-pound maximum loads for easy rig-up/rig-down. This is the third of this rig type HSMC has produced for Hercules.

The Oilwell rigs also represent the latest in specialized drilling technology. Destined for the oil fields of Abu Dhabi to work for ADMASCO, these two desert rigs are rated to a depth of 9,000 feet and have been trailerized with oversized desert tires and skid-mounted mud systems. These are the fifth and sixth rigs HSMC/Rig-Up Services has built for USS Oilwell in 1982. The first two were 9,000-foot geothermal rigs which featured a unique mud cooling tower designed and fabricated by HSMC. Bound for Indonesia, they will drill for Pertamina, the national oil company. The other two, also for ADMASCO, were the 12,000-foot big brothers of the desert rigs currently under completion. The Cooper rig, rated at 16,000 feet, will go to Colombia for Texaco. Moves in rugged terrain will be made more efficiently with the compact, minimum-load HSMC design.

HSMC/Thermotics produces steam generators for enhanced oil recovery, and HSMC/Metrol Production Systems supplies oil and gas production equipment. HSMC/Marine Systems fabricates motion compensators/tensioners and cranes for offshore drilling applications, and HSMC/En-Flo Valves produces high temperature valves for petroleum refining applications.

For complete information on all services provided by Houston Systems Manufacturing,

Write 55 on Reader Service Card

"I KNOW HE'S GOOD, I TRAINED HIM."

Bertie Spell is foreman of our hull department. He's a genius at shipfitting, and is probably the best plate hanger in the southeast.

If Bertie's the best, then J.G. Bennet (photographed on the ladder) is a close second. He was trained by Bertie, and has earned his stamp of approval. J.G. is a Boilermaker Leaderman at our yard. He's an expert at boiler repairs and tough steel work.

The point is simply this. We're talking about "skilled" craftsmen. Highly skilled. And that's why you should come to Savannah for your voyage repairs, major conversions, alterations or drydocking.

At Savannah your job will get the craftsmen. They do the job once, correctly Which saves time and money So come to us for a high level of professionalism in addition to Savannah's high year-round temperatures. That combination will give you a nice, secure, warm feeling.

Savannah Shipyard Company. Reach us by telex or telephone. Telex 546426 SAVMACSHIP SAV., P.O. Box 787, Savannah, Ga. 31402. Telephone (912) 233-6621. Or call our New York office: 74 Trinity Place, Suite 1800, New York, NY 10006. Telephone (212) 432-0350.

THE SAVANNAH YARD

Write 324 on Reader Service Card

Largest self-propelled oil skimmer in the U.S. is powered by two Caterpillar 3408 DITA engines.

Gladding Hearn Delivers Largest Self-Propelled U.S. Skimmer To Clean Sound

The North Sounder, reported to be the largest self-propelled oil-spill skimmer in the U.S., was placed in service recently in Seattle, Wash., for the protection of Puget Sound waters by Clean Sound, an organization of 13 petroleum industry companies. The North Sounder will be based in Bellingham, Wash.

The 73-foot vessel joins a fleet of smaller skimmers, auxiliary boats, and barges Clean Sound has stationed at ports throughout Puget Sound.

Unlike other skimmers operated by Clean Sound which have unique or bulky profiles, the North Sounder looks like a small Coast Guard buoy tender. When operating in its oil-spill recovery mode, the vessel's bow opens to reveal an escalator-like ramp leading from under the water surface and into the mid-hull area of the boat.

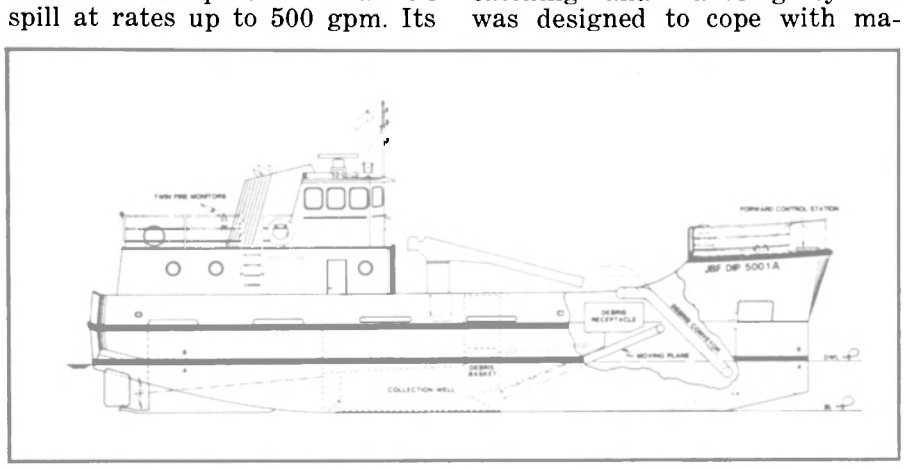
The North Sounder is designed to recover 90 percent of an oil spill at rates up to 500 gpm. Its onboard recovered oil capacity is 12,000 gallons.

"With this addition to the equipment pool," reported **John Wiechert**, manager of Clean Sound, "our oil industry members have invested more than $6 million in equipment in the Puget Sound area to assure a rapid and effective response to any oil spill in the waters of the Sound and Washington's coastal waters."

The value of the new skimmer alone exceeds $1.6 million, and represents the largest single investment by Clean Sound.

"Because of the North Sounder's proven seaworthiness, Clean Sound can plan for recovery of spilled oil in our state's offshore waters," Mr. **Wiechert** noted.

Several design changes developed by the Clean Sound staff have been incorporated in the North Sounder. The most significant is an improved method of recovering oily debris. The debris catching and handling system was designed to cope with materials such as logs, branches, kelp, eel grass, and other floating debris.



Profile of the North Sounder.

The North Sounder was designed by JBF Scientific Corporation of Wilmington, Mass., which has designed and delivered more than 100 oil-skimming vessels, including 50 harbor skimmers for the Navy. Clean Sound's new skimmer is a JBF model DIP 5001A. Representing JBF at the ceremony in Seattle was **Ralph A. Bianchi**, president.

JBF's oil recovery system utilizes the natural propensity of oil to float on water that "forces" a mechanical separation of surface oil from the water. A dynamic inclined plane (DIP) in the bow of the vessel forces oil-coated water into a collection well in the vessel's hull under the surface level. The DIP's moving belt pushes the oil lower than its natural level, gravity then separates it, and the oil wells-up inside the vessel into a collection tank. Recovered oil is continuously pumped from the collection tank area to onboard holding tanks or by flexible hose to a trailing oil barge.

The vessel was constructed by Gladding-Hearn, of Somerset, Mass. A contract was let in late 1981, and the vessel was completed in November 1982.

Because of its traditional hull design, the North Sounder can respond to a spill at speeds up to 10.6 knots. During normal oil skimming operations, it runs at 1 to 2 knots in conditions up to Sea State 3. It can work alone or with long containment booms attached to its bow and towed in a "V" configuration to funnel slicks of oil to the recovery system.

A unique feature of the design is an auxiliary control station at the bow above the oil recovery machinery which allows operation of the vessel while monitoring the recovery.

The recovery system consists of two conveyor units. The debris collection unit is a stainless-steel conveyor that leads up to debris collection equipment. The oil-handling unit is a powered 6-foot-wide by 37½-foot-long polyvinylchloride belt which loads oil into the vessel's cargo tanks. The belt is driven by a Char-Lynn hydraulic motor. The DIP conveyor is located in the forward half of the hull, behind the debris conveyor.

The handling system for the recovered oil is a progressing cavity screw pump type, a Moyno model 1JOKS1-CDQ. It has a 500-gpm capacity with a speed of zero to 350 rpm and is driven by a Sundstrand hydraulic motor.

The vessel has a length of 73 feet, beam of 20 feet, draft (full load) of 6 feet 3 inches, and displacement of 130 tons. The two main engines, each driving a Federal 42-inch four-blade propeller through a Twin Disc 3:1 reductor gear box, are Caterpillar model 3408 DITA units rated at 365 hp each.

NORTH SOUNDER
Major Suppliers

Main Propulsion	(2) Caterpillar
Reduction Gears	Twin Disc
Propellers	Federal
Generators	Northern Lights
Generator Engines	John Deere
Engine Controls	Wabco
Steering	Char-Lynn
Sanitation System	Microphor
Radar	Furuno
VHF	Cybernet
Depth Indicator	Sandpiper
Crane	Scott
Windlass	Pine Hill
Coatings	Devran, Cathacote

Manpower for the North Sounder as well as other skimmers and specialized spill recovery equipment is provided on contract by Foss Launch & Tug Co. Equipment is stationed in Seattle, Tacoma, Anacortes, Blaine, Bellingham, Edmonds, and Port Angeles.

Clean Sound is an unincorporated, nonprofit, joint venture of oil and oil transportation companies. Members are: American Tar Company, Atlantic Richfield Company, Chevron U.S.A., Inc., Foss Launch & Tug Company, Mobil Oil Corporation, Olympic Pipe Line Company, PRI Northwest, Inc., Shell Oil Company, Texaco Inc., Time Oil Company, Transmountain Oil Pipeline Corp., Union Oil of California, and U.S. Oil & Refining Company.

Since its founding in 1971 as one of the nation's first regional organizations of its type, Clean Sound has served as a model in the development of spill recovery techniques, technical requirements for equipment designs, and of industry training programs.

A four-page brochure is available describing Clean Sound. For a free copy,

Write 52 on Reader Service Card

Thomas Prashun Joins Trans Freight Lines

Thomas Prashun has been named corporate maintenance manager for Trans Freight Lines, Inc., of Secaucus, N.J., the largest independent carrier in the North Atlantic trades. The announcement was made recently by **Donald F. McBeth**, senior vice president, operations.

Mr. **Prashun** brings many years of experience in the industry to TFL. He will be located at TFL Secaucus headquarters and will report to Mr. **McBeth**. Trans Freight Lines, Inc., is a subsidiary of Thomas Nationwide Transport, Ltd., Australia's largest transportation conglomerate.

"I KNOW HE'S GOOD, I TRAINED HIM."

B. E. Spell

Bertie Spell is foreman of our hull department. He's a genius at shipfitting, and is probably the best plate hanger in the southeast.

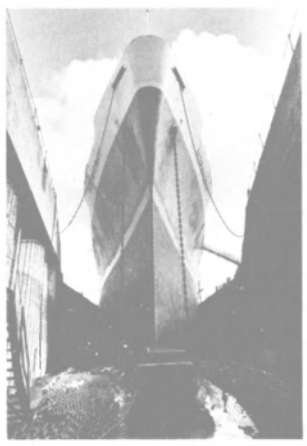
If Bertie's the best, then J.G. Bennet (photographed on the ladder) is a close second. He was trained by Bertie, and has earned his stamp of approval. J.G. is a Boilermaker Leaderman at our yard. He's an expert at boiler repairs and tough steel work.

The point is simply this. We're talking about "skilled" craftsmen. Highly skilled. And that's why you should come to Savannah for your voyage repairs, major conversions, alterations or drydocking.

At Savannah your job will get the craftsmen. They do the job once, correctly. Which saves time and money. So come to us for a high level of professionalism in addition to Savannah's high year-round temperatures. That combination will give you a nice, secure, warm feeling.

Savannah Shipyard Company. Reach us by telex or telephone. Telex 546426 SAVMACSHIP SAV., P.O. Box 787, Savannah, Ga. 31402. Telephone (912) 233-6621. Or call our New York office: 74 Trinity Place, Suite 1800, New York, NY 10006. Telephone (212) 432-0350.

THE SAVANNAH YARD



Write **324** on Reader Service Card

Largest self-propelled oil skimmer in the U.S. is powered by two Caterpillar 3408 DITA engines.

Gladding Hearn Delivers Largest Self-Propelled U.S. Skimmer To Clean Sound

The North Sounder, reported to be the largest self-propelled oil-spill skimmer in the U.S., was placed in service recently in Seattle, Wash., for the protection of Puget Sound waters by Clean Sound, an organization of 13 petroleum industry companies. The North Sounder will be based in Bellingham, Wash.

The 73-foot vessel joins a fleet of smaller skimmers, auxiliary boats, and barges Clean Sound has stationed at ports throughout Puget Sound.

Unlike other skimmers operated by Clean Sound which have unique or bulky profiles, the North Sounder looks like a small Coast Guard buoy tender. When operating in its oil-spill recovery mode, the vessel's bow opens to reveal an escalator-like ramp leading from under the water surface and into the mid-hull area of the boat.

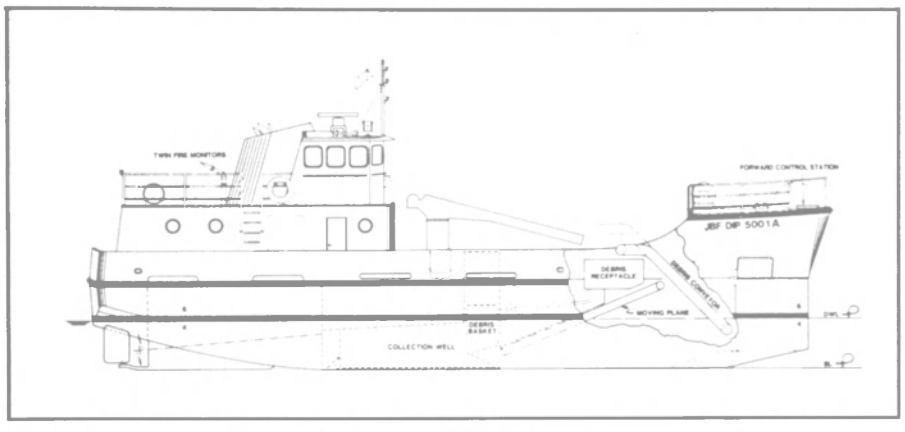
The North Sounder is designed to recover 90 percent of an oil spill at rates up to 500 gpm. Its onboard recovered oil capacity is 12,000 gallons.

"With this addition to the equipment pool," reported **John Wiechert**, manager of Clean Sound, "our oil industry members have invested more than $6 million in equipment in the Puget Sound area to assure a rapid and effective response to any oil spill in the waters of the Sound and Washington's coastal waters."

The value of the new skimmer alone exceeds $1.6 million, and represents the largest single investment by Clean Sound.

"Because of the North Sounder's proven seaworthiness, Clean Sound can plan for recovery of spilled oil in our state's offshore waters," Mr. **Wiechert** noted.

Several design changes developed by the Clean Sound staff have been incorporated in the North Sounder. The most significant is an improved method of recovering oily debris. The debris catching and handling system was designed to cope with materials such as logs, branches, kelp, eel grass, and other floating debris.



Profile of the North Sounder.

The North Sounder was designed by JBF Scientific Corporation of Wilmington, Mass., which has designed and delivered more than 100 oil-skimming vessels, including 50 harbor skimmers for the Navy. Clean Sound's new skimmer is a JBF model DIP 5001A. Representing JBF at the ceremony in Seattle was **Ralph A. Bianchi**, president.

JBF's oil recovery system utilizes the natural propensity of oil to float on water that "forces" a mechanical separation of surface oil from the water. A dynamic inclined plane (DIP) in the bow of the vessel forces oil-coated water into a collection well in the vessel's hull under the surface level. The DIP's moving belt pushes the oil lower than its natural level, gravity then separates it, and the oil wells-up inside the vessel into a collection tank. Recovered oil is continuously pumped from the collection tank area to onboard holding tanks or by flexible hose to a trailing oil barge.

The vessel was constructed by Gladding-Hearn, of Somerset, Mass. A contract was let in late 1981, and the vessel was completed in November 1982.

Because of its traditional hull design, the North Sounder can respond to a spill at speeds up to 10.6 knots. During normal oil skimming operations, it runs at 1 to 2 knots in conditions up to Sea State 3. It can work alone or with long containment booms attached to its bow and towed in a "V" configuration to funnel slicks of oil to the recovery system.

A unique feature of the design is an auxiliary control station at the bow above the oil recovery machinery which allows operation of the vessel while monitoring the recovery.

The recovery system consists of two conveyor units. The debris collection unit is a stainless-steel conveyor that leads up to debris collection equipment. The oil-handling unit is a powered 6-foot-wide by 37½-foot-long polyvinylchloride belt which loads oil into the vessel's cargo tanks. The belt is driven by a Char-Lynn hydraulic motor. The DIP conveyor is located in the forward half of the hull, behind the debris conveyor.

The handling system for the recovered oil is a progressing cavity screw pump type, a Moyno model 1JOKS1-CDQ. It has a 500-gpm capacity with a speed of zero to 350 rpm and is driven by a Sundstrand hydraulic motor.

The vessel has a length of 73 feet, beam of 20 feet, draft (full load) of 6 feet 3 inches, and displacement of 130 tons. The two main engines, each driving a Federal 42-inch four-blade propeller through a Twin Disc 3:1 reductor gear box, are Caterpillar model 3408 DITA units rated at 365 hp each.

NORTH SOUNDER
Major Suppliers

Main Propulsion	(2) Caterpillar
Reduction Gears	Twin Disc
Propellers	Federal
Generators	Northern Lights
Generator Engines	John Deere
Engine Controls	Wabco
Steering	Char-Lynn
Sanitation System	Microphor
Radar	Furuno
VHF	Cybernet
Depth Indicator	Sandpiper
Crane	Scott
Windlass	Pine Hill
Coatings	Devran, Cathacote

Manpower for the North Sounder as well as other skimmers and specialized spill recovery equipment is provided on contract by Foss Launch & Tug Co. Equipment is stationed in Seattle, Tacoma, Anacortes, Blaine, Bellingham, Edmonds, and Port Angeles.

Clean Sound is an unincorporated, nonprofit, joint venture of oil and oil transportation companies. Members are: American Tar Company, Atlantic Richfield Company, Chevron U.S.A., Inc., Foss Launch & Tug Company, Mobil Oil Corporation, Olympic Pipe Line Company, PRI Northwest, Inc., Shell Oil Company, Texaco Inc., Time Oil Company, Transmountain Oil Pipeline Corp., Union Oil of California, and U.S. Oil & Refining Company.

Since its founding in 1971 as one of the nation's first regional organizations of its type, Clean Sound has served as a model in the development of spill recovery techniques, technical requirements for equipment designs, and of industry training programs.

A four-page brochure is available describing Clean Sound. For a free copy,

Write 52 on Reader Service Card

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Centrico Forms Mineral Oil Group, Lohmeyer Named Head Of Unit

Rising demand for Westfalia oil purifying centrifuges has spurred the formation of a Mineral Oil Group at Centrico, Inc., North Vale, N.J., it was recently announced by **Wend Wendenburg**, executive vice president of Centrico.

Centrico, Inc. is the North American distributor of Westfalia separators and related systems.

Westfalia oil-purifying separators remove both water and solid particles from fuel and lubricating oil. This allows engines to burn heavier, less expensive grades of diesel fuel, as well as recycle lubricating oil. The results include major savings in fuel and lube oil costs, reduced engine wear, reduced maintenance requirements, and less engine downtime.

Head of the new group will be **Klaus Lohmeyer**, manager of marine and power systems for Centrico. Mr. **Lohmeyer** is a former seagoing chief engineer with experience in a wide tonnage range of merchant vessels. Before coming to Centrico he was employed at Westfalia Separator AG for 15 years where he became a specialist in oil purification systems. He will be responsible for all sales and engineering activities in four fields: (1) marine applications, including small boats, offshore drilling, fisheries, etc.; (2) land-based power plants; (3) gas turbine fuel purification and washing systems; and (4) lubricants, coolants and hydraulic fluids, etc., used in the metalworking industries.

For more information on Westfalia,

Write 65 on Reader Service Card

Frydenbo Steering Gear Contract Awarded Triconn For TAKX RO/RO Vessels

Triconn Corporation of Redding, Conn., was recently awarded a contract by General Dynamics, Quincy Shipbuilding Division, Quincy, Mass., to furnish five shipsets of Frydenbo HS 702 D rotary vane steering gear for the TAKX prepositioning ships presently under construction.

Each steering gear can produce 15,000,000 in. lbs. of torque and also acts as the rudder carrier and upper radial bearing, thus providing a compact, unitized steering mechanism to reduce shipyard installation costs.

In addition, dual independent power units utilizing reliable low pressure, constant displacement screw pumps completes the hydraulics package. With this order a total of eight RO/RO-type vessels being chartered to MSC as part of the TAKX program have Frydenbo steering gears.

Frydenbo is the world's largest manufacturer of rotary vane type steering gears with over 6,000 ships in operation. Triconn Corporation is their exclusive U.S. licensee.

For more information,

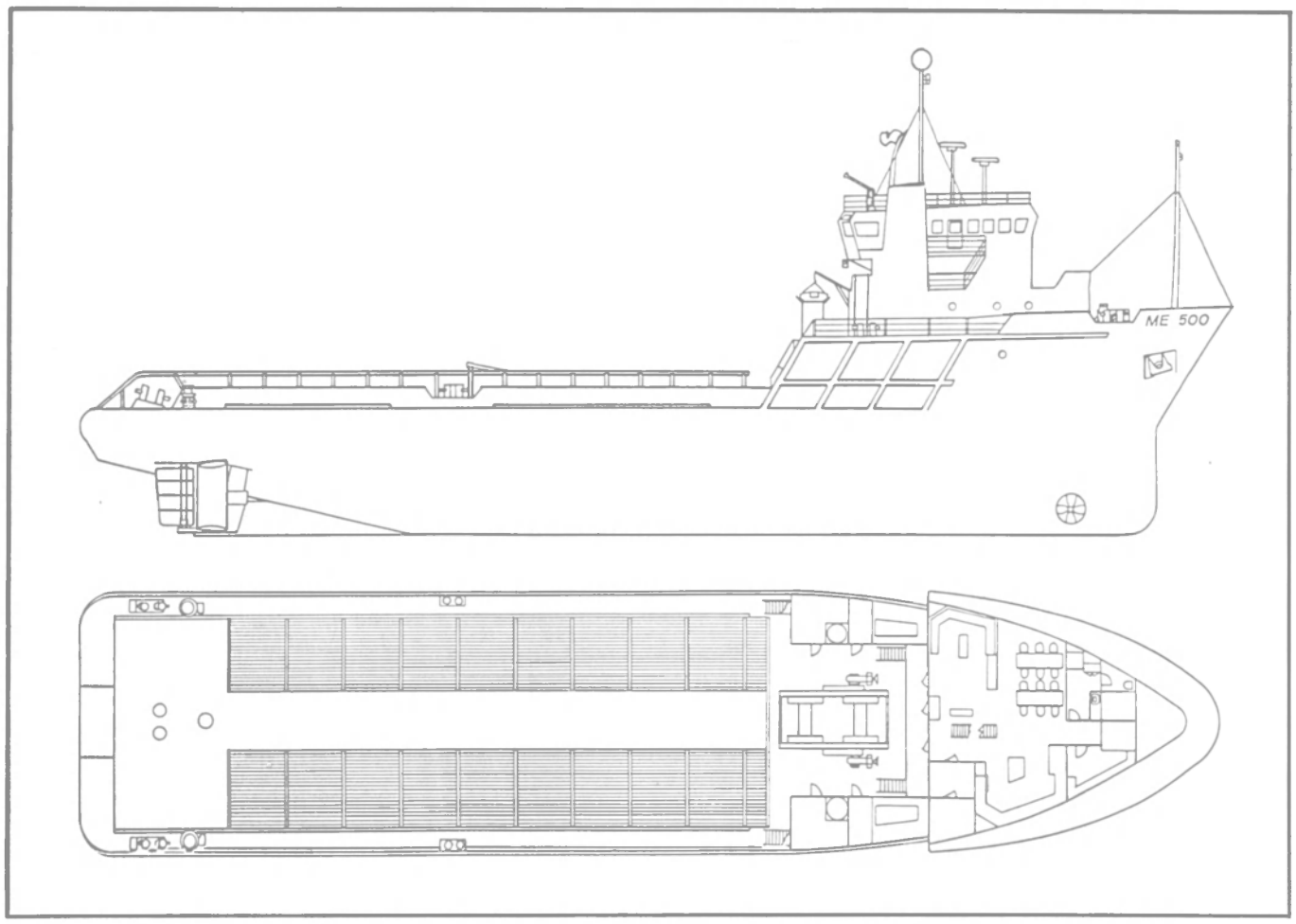
Write 71 on Reader Service Card

$6-Million Title XI Sought For Posted Drilling Barge

Maritime and Offshore Equipment Leasing Co., a subsidiary of Paden, Inc., Orange, Texas, has applied for a Title XI guarantee to aid in financing the construction of a posted drilling barge.

The 209-foot 6-inch by 54-foot barge will be used in international waters of up to 22 feet. Levingston Shipbuilding Co., Orange, Texas, is the proposed builder of the barge which is scheduled to be delivered in December.

If approved, the Title XI guarantee would cover $6 million or 75 percent of the estimated actual cost of $8 million.



LEEVAC Shipyards Will Produce World Class ME 500 Tug Supply Vessel

LEEVAC Shipyards, a division of Morgan City-based LEEVAC Corporation, has announced it has developed a World Class Tug/Supply Vessel in conjunction with a Norwegian design team.

The 70-year-old Jennings, La., shipyard has taken a giant leap ahead by answering the need for a vessel designed to withstand even the roughest environments throughout the world. As a joint effort with Maritime Engineering of Oslo, Norway, LEEVAC has developed a vessel that meets the needs for crew comfort, rig support, supply and movement capabilities — in the toughest of conditions.

This new vessel, named the ME 500, "is even more performance-oriented than the top of the line Gulf Coast-designed vessel," according to **Bob Burlet**, marketing director, LEEVAC Shipyards.

"Our goal was to develop a vessel that would be the ultimate in seaworthiness," Mr. **Burlet** explained.

Maritime Engineering, an internationally known marine vessel designer, was contacted and agreed to a joint venture utilizing an already proven Maritime Engineering design. LEEVAC then turned to both boat operators and major oil companies and posed the question: "Would you be interested in an American-built Norwegian design? Their response was an emphatic 'Yes'," said Mr. **Burlet**.

"Everyone was quite helpful in giving us an idea of what they did and didn't want in a World Class vessel. We've tried to incorporate all of their suggestions into the 500."

One of the major advantages of the 500 that sets it apart from a Gulf Coast-designed boat is its 21-foot depth, allowing for greater freeboard, higher carrying capacities, and larger propellers. Another advantage is the 500's bollard pull — a feature of special interest to the companies LEEVAC approached.

"Even with all of its built-in features, the cost of a 500 should be quite competitive," said Mr. **Burlet**. "This is due in part to our utilization of cost-efficient American machinery and construction methods, and the use of an existing, proven design.

"While many shipyards and design firms are currently starting from scratch to develop or modify designs for international use, we've started at the top. We have taken the design of an internationally known and respected Norwegian designer and have engineered it to be classed under American flag."

Other member divisions of LEEVAC Corporation are LEEVAC Petroleum and LEEVAC Marine Transportation who, along with LEEVAC Shipyards, provide a comprehensive and integrated system of products and services. LEEVAC Marine Transportation is involved in the bunkering, lightering and transportation of petroleum products. LEEVAC Petroleum provides diesel fuels, lubricants and supplies for rigs and vessels. LEEVAC Shipyards offers design, construction, and repair of boats, barges, and offshore quarters.

ME 500

Principal dimensions	
Length	201 ft
Breadth	44 ft
Depth	21 ft
Draft	17 ft
Speed	14.5 knots
Capacities	
Drilling water	150,000 gallons
Potable water	47,000 gallons
Fuel oil	175,000 gallons
Main deck cargo	750 tons
Propulsion machinery	
Main engines	(2) EMD 20-645E7B, 7,000 bhp
Bow thrusters	(1) 600 hp
Generators	(2) 226 kw
Bollard pull	211,000 lbs
Anchor handling/ Towing winch	(1) double drum, maximum pull: 230,000 lbs; brake pull: 550,000 lbs
Navigation/Communications	
Autopilot w/gyrocompass	
Magnetic compass	
Direction finder	
Echosounder	
Radio	
Public address system	
(2) VHFs	
Speed Log	
(2) Radars	
Loran	

Crosby Group Announces Promotions Of Sales And Operations Executives

The Crosby Group, Inc., a subsidiary of American Hoist and Derrick of St. Paul, Minn., recently announced that **Richard Sked**, formerly vice president, sales, has been promoted to vice president, sales planning and administration.

In this position, Mr. **Sked** will have the responsibility for product sales managers, all inside sales, and long-range strategic sales planning. **William Craig** has been named vice president, domestic sales. Mr. **Craig** will be responsible for all domestic sales for the Crosby Group. Both Messrs. **Sked** and **Craig** will now report to **William Shen**, vice president of marketing.

John Kozuk, formerly chain sales manager, has been promoted to the newly created position of Eastern sales manager. In his new capacity, Mr. **Kozuk** will be responsible for all field sales functions in the Eastern half of the U.S.

Larry Postelwait, formerly operations manager, has been promoted to vice president, operations. He will be responsible for all Crosby plant operations.

Waukesha Bearings Named Master U.S. Distributor Of Thordon Compounds

Thordon elastomeric bearing compounds will be distributed in the U.S., its territories and possessions by Waukesha Bearings Corporation, Waukesha, Wisc., as a result of an agreement between the firm and Thomson-Gordon Ltd. of Canada, the developer and manufacturer of Thordon.

According to the agreement, Waukesha Bearings is the master U.S. distributor and area technical manager for the material. The Thordon product line will continue to be available from Thomson-Gordon's existing base of U.S. distributors, and will be sold in concert with the Waukesha Bearings Corporation's national sales force.

Thordon is a blend of synthetic rubber and polymers impregnated with friction-reducing compounds. It is machinable and/or can be molded into a variety of shapes to suit specific bearing applications. It is particularly well suited for use in water lubricated stern tube marine bearings for all types of vessels.

It is offered in three standard compounds known as "Thordon Regular, XL and SXL," each addressing specific requirements of the marine application. A wide variety of generic shapes and special configurations are available, including rods, sheets, tubes, tape, and molded products.

For literature,

Write 60 on Reader Service Card

Interocean Steamship Buys Lykes Steamship For $150-Million

W.J. **Amoss Jr.**, president and chief executive officer of Lykes Bros. Steamship Co., Inc., New Orleans, La., announced recently that the purchase of Lykes Steamship by Interocean Steamship Corp. from The LTV Corporation has been completed.

The sale price was $150 million including $85 million in cash. Interocean is a Florida company owned by Lykes Bros. Inc., of Florida, Mr. **Amoss**, and two other Lykes Steamship senior executives, **Robert J. Brennan** and **Eugene F. McCormick.**

Lykes Bros. Inc., based in Tampa, is the original parent company of Lykes Steamship. LTV and Lykes Corp., of which Lykes Steamship was a subsidiary, merged in December of 1978. Mr. **Amoss** said: "Lykes Steamship will continue to provide the shipping public with the efficient, responsive service it has come to associate with Lykes.

"We have enjoyed our association with the LTV Corporation," Mr. **Amoss** continued. "Our relationship was always a good one. LTV gave us considerable freedom in both day-to-day operations and long-range development. As a result of the association, Lykes is a disciplined, quantitative-oriented organization.

"We are very enthusiastic about Lykes's future," the chief executive officer said. "Because of the sale, we will have the flexibility to devote our resources to vessel replacement and expect to move ahead with the fleet replacement program we already have in a development stage.

Lykes Steamship, based in New Orleans, operates a fleet of 46 U.S.-flag cargo ships on trade routes covering the U.S. Gulf, West. and South Atlantic coasts, the Great Lakes and St. Lawrence Seaway, Northern Europe and the United Kingdom, the Mediterranean, South and East Africa, the west coast of South America, and the Far East. Lykes Steamship has been in service for more than 80 years. Among the innovations it introduced into shipping was the SEABEE barge, container, and heavy lift vessel.

Climax Offers 56-Page Publication On Super 12 Percent Cr Steels

Climax Molybdenum Company of Ann Arbor, Mich., a unit of Amax Inc., has released "The Super 12% Cr Steels — An Update."

The 56-page publication contains information on currently available Super 12 percent Cr steels, their physical and mechanical properties, standards and specifications, producers, corrosion and oxidation resistance, and fabrication properties. This update is intended as a supplement to "The Super 12% Cr Steels" by **J.Z. Briggs** and **T.D. Parker**.

This is a detailed, extremely informative report containing thousands of facts, charts, graphs, etc. For a free copy,

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Union Carbide Seeks $80-Million Title XI For Product Tanker

Union Carbide Marine Fleet, Inc., a subsidiary of Union Carbide Corp., Danbury, Conn., and Marine Chemical Steamship Co., Inc., a subsidiary of Marine Transport Lines, Inc., New York, N.Y., have applied for a Title XI guarantee to aid in financing the construction of a 35,000-dwt chemical and product carrier.

The steam-turbine, 17,500 shp vessel, to be named the Chemical Pioneer, is expected to operate on the U.S. Gulf and East Coasts and to and from Puerto Rico. Newport News Shipbuilding, Newport News, Va., is building the tanker. Delivery is set for August. If approved, the Title XI guarantee would cover $80,813,000 of the estimated actual cost of $132,219,000.

Unaflex Offers 12-Page Catalog On Expansion Joints, Connectors, Hose

The Unaflex Rubber Corporation of Ft. Lauderdale, Fla., is offering copies of a new "short form" catalog covering its lines of expansion joints, flexible connectors, and custom hose.

The catalog contains dimensional drawings and charts, photographs and descriptions of the makeup and capabilities of the products, and cutaway drawings of construction details. Unaflex also has available complete technical catalogs on all its expansion joints and rubber hose products.

For a free copy of the "short form" catalog,

Write 77 on Reader Service Card

USCG Proposes Rules For Offshore Supply Vessels

The U.S. Coast Guard has issued an advanced notice of proposed rulemaking concerning new offshore supply vessels.

The regulations would implement the provisions of the law (P.L. 96-378) regarding inspection standards for such vessels, taking into consideration their method of operations, and the service in which they are engaged. New vessels are defined as those not in service on or before January 1, 1979, or on order before October 6, 1980.

Comments are due on or before June 14. They should be mailed to Commandant (G-GMC/44), (CGD 82-004), U.S. Coast Guard, Washington, D.C. 20593. A copy of the proposal was published in the February 14 Federal Register.

Navy Awards $1.2-Million Computer Contract To ADI —Literature Offered

Applied Dynamics International, Inc. (ADI) of Ann Arbor, Mich., was awarded a $1.2-million contract by the U.S. Navy, it was announced recently by **G.F. Graber**, president.

Under the contract, ADI will supply the Navy with advanced computer hardware and software to be used in research and for testing purposes. Included is the first model FX, ADI's latest product innovation, and three unique ADI System 10 computers.

ADI's computer systems are used to simulate complex dynamic systems associated with the design and engineering of new products, such as aircraft, propulsion systems, and spacecraft. Called real time dynamic simulation, the process allows industry and government to test and evaluate the "hardware" under real operational conditions, thus providing better designs and reducing development cost.

For more information,

Write 62 on Reader Service Card

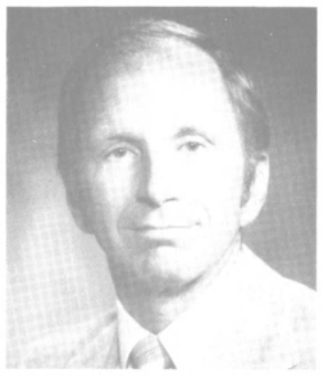
Ship Design For Fuel Economy Subject Of WEGEMT Summer Program

The eighth graduate school conducted under the West European Graduate Education Marine Technology (WEGEMT) program will be held August 29-September 9, 1983.

The courses, concerning ship design for fuel economy, will be conducted at Chalmers University of Technology in Gothenburg, Sweden, in collaboration with the Swedish Maritime Research Center (SSPA). The syllabus is concerned primarily with resistance and propulsion, machinery, and design and operation. It features a faculty from Denmark, Netherlands, Norway, Sweden, U.K., U.S., and West Germany.

For more information, contact: WEGEMT Graduate School, Chalmers University of Technology, Dept. of Ship Hydromechanics, S-41296, Gothenburg, Sweden. Tel. 46-31-810100; telex 2369 Chalbib s.

John Detter Named V.P. Of Manufacturing At CRC



John Detter

CRC Pipeline Equipment, Houston, Texas, has appointed **John Detter** as vice president-manufacturing. **Wynn Norris,** president of CRC made the announcement. Mr. **Detter,** formerly plant manager, will be in charge of all plant operations at the company's Tulsa, Okla. facility.

CRC Pipeline Equipment is a division of the Houston-based Crutcher Resources Corporation and engages in the manufacture, sales and service of specialized pipeline construction equipment.

Hayward Expands Line Of High Pressure Strainers —Literature Available

Hayward Industrial Products, Inc., of Elizabeth, N.J., one of the country's leading manufacturers of pipeline strainers, has expanded its line of high pressure, cast-steel basket strainers by adding three new types of end connections.

Previously available in 1 to 4-inch with flanged end connections, Hayward high pressure strainers are now available in 1-inch, 1½-inch and 2-inch with threaded, socket and butt weld end connections. Hayward high-pressure strainers are available in both Duplex and Simplex models. Both models have bolted covers and are designed with legs for bolting to floor or deck. Duplex models offer the advantage of uninterrupted flow.

For more information,
Write 75 on Reader Service Card

SNAME To Play Major Role In Converting Milspecs To Commercial Standards

The Society of Naval Architects and Marine Engineers (SNAME) in cooperation with the Naval Sea Systems Command (NAVSEA), and the American Society for Testing and Materials (ASTM), is going to make a major effort to help develop more U.S. Shipbuilding Standards.

The Technical and Research (T&R) Steering Committee of the society has approved a plan for technical experts of the T&R panels to review and update selected naval specifications and standard drawings before their development into voluntary shipbuilding standards. This will serve to speed up the National Shipbuilding Standards Program.

There are many thousands of MILSPECS, a portion of which are ideal for converting into commercial shipbuilding standards. SNAME will do the job of updating with the aid of T&R volunteers, and turn them over to the ASTM Committee F-25 on shipbuilding for development into published standards.

SNAME officials said it is an accepted fact that an extensive and comprehensive set of shipbuilding standards can be instrumental in lowering costs and improving the shipbuilding process.

The ASTM program to develop shipbuilding standards was begun in 1977 with the reactivation of the SNAME Panel SP-6 (Standards and Specifications) of the Ship Production Committee of the society. Panel SP-6 has been serving as the industry's guidance committee as the standards are being developed through ASTM consensus process and published by that organization.

Panel SP-6 will serve as SNAME's control committee on this expanded program of commercializing the MILSPECS, coordinating the flow through the SNAME organization to the ASTM committees.

SPC/IREAPS Seeks Papers For Delivery At Tenth Technical Symposium

A "Call for Papers" was issued recently by SPC/IREAPS for delivery at the 10th annual technical symposium to be held August 23-25, 1983, at The Western Hotel-Copley Place, Boston, Mass.

A topic form supplied by the organization should be submitted by April 15, and a 100-word abstract of the technical paper is due by May 6.

The symposium is sponsored by the Ship Production Committee (SPC) of The Society of Naval Architects and Marine Engineers and the Institute for Research and Engineering for Automation and Productivity in Shipbuilding (IREAPS). The two organizations formed a coalition in November 1982 dedicated to promoting the interests of the shipbuilding industry and increasing productivity.

Papers should be concerned with topics such as computer applications in ship design, production, and repair; shipbuilding methods and ship productibility; enhancing worker productivity; planning and production control; and development of shipbuilding standards.

Also, U.S. implementation of foreign shipbuilding technology; materials handling and other industrial engineering concerns; productivity issues in Navy building, repair, and overhaul; and productivity considerations for the small yard.

The 1982 symposium was attended by nearly 400 persons representing more than 50 shipyards, 12 U.S. Government agencies, and 75 other organizations from the international shipbuilding sector.

For more information, contact **Linda Bender** or **Pamela Slechta,** SPC/IREAPS Technical Symposium, 10 West 35 Street, Chicago, Ill. 60616. Tel. (312) 567-4618.

$6-Million Engineering Contract Awarded Ingalls For Aegis Missile Cruiser

Ingalls Shipbuilding Division, Litton Systems Incorporated, Pascagoula, Miss., has been awarded a $6-million cost-plus-award-fee contract for engineering changes to the CG-47 class ships. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-78-C-2316).

Venezuelan Yard Awards $1.2-Million Production Line Contract To TTS

Total Transportation Systems, Inc. (TTS) of Newport News, Va., announced recently it was awarded a $1.2-million contract for a panel production line with associated welding equipment by Diques Y Astilleros Nacionales C.A. (DIANCA) of Puerto Cabello, Venezuela.

Rear Adm. **Carlos Paez Celis,** president of DIANCA, stated that the panel line will significantly enhance the yard's capability to compete in the new construction market. The new installation will initially be employed in construction of a 5,000-ton floating drydock which DIANCA has on order; however, the line is designed to suit a wide range of applications.

The order marks Total Transportation System's first installation in Latin America. The TTS Group, headquartered in Norway, has installed mechanized production lines and custom-designed material-handling systems in about 50 shipyards worldwide, including several installations in the U.S. In addition to the order from DIANCA, TTS is supplying equipment to shipyards in the Far East, Europe, and the U.S., and is engaged in development of material-handling systems for offshore industry customers.

For more information,

Write 72 on Reader Service Card

Navy Awards $12.8-Million Sonobuoy Contract To Canadian Company

Canadian Commercial Corporation, Dartmouth, Nova Scotia, Canada, has been awarded a $12,835,656 firm-fixed-price contract to furnish 20,397 AN/SSQ-53B sonobuoys with packaging and associated data. The Naval Avionics Center, Indianapolis, is the contracting activity (N00163-83-C-0066).

$2.2-Million Navy Contract For Technical Services Awarded To Tracor

William C. Moyer, group vice president for the Applied Sciences Group of Tracor, Inc., Austin, Texas, recently announced the receipt of a $2.2-million U.S. Navy contract with a potential value totaling $7.3 million to provide technical engineering support services for the Naval Electronic Systems Engineering Activity in St. Inigoes, Md.

Under the contract, which is for a period of one year with two one-year options, Tracor engineers will support ongoing programs in computer services, management information systems, electromagnetic environmental effects, and electronic equipment safety, as well as support test documentation for the combat system of the FFG-7 class ship.

The services will be performed by the Electronics Systems Division of Tracor Applied Sciences, Falls Church, Va., under the direction of **Robert G. Shuster**, division vice president. Mr. **Shuster** has appointed **Jesse N. Hawes** as program manager. Mr. **Moyer** said Tracor will employ as subcontractors: Bendix Field Engineering Corporation, Columbia, Md.; Strausberg Associates, Inc., Kensington, Md.; and Semcor, Inc., Lexington Park, Md.

MarAd Releases Report On Novel "Outside Hull" Propulsion System

The Maritime Administration has released a technical report which further explores the feasibility of a novel concept for ship propulsion. The report, "Resistance Reduction in Merchant Ships by the New Propulsion System," was prepared for MarAd by the University of Rhode Island.

The New Propulsion System — the name of the concept — uses a hydraulic transmission outside the ship's hull. An axial-flow pump driven directly at high speed by the ship's main engine(s) imparts energy to the seawater which drives the propeller through turbine blades attached inside the propeller hub. Thrust is available from both the turbine discharge jet and the propeller.

Principal investigators of the New Propulsion System, including the inventor, at the University of Rhode Island, say this system configuration enables a simplified method to be used for the construction of energy-efficient contra-rotating propellers that are directly driven by a single shaft. This would eliminate the main reduction gear and provide increased efficiency through savings in weight, space, and cost.

The development and application of the novel system has been under active research at the university for six years. It was invented by Dr. **Herman E. Sheets**, who formerly headed the university's ocean engineering program.

Previous research was conconducted under contracts with MarAd and the Office of Naval Research. Among other things, the researchers say, they successfully tested a 10-hp unit in the laboratory and demonstrated the feasibility of its application to surface ships.

The latest study assessed additional benefits of the application of the New Propulsion System in reducing drag due to boundary layer suction about a ship's hull.

Copies of the report are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161. The order number is PB83-162487; the price is $9.50.

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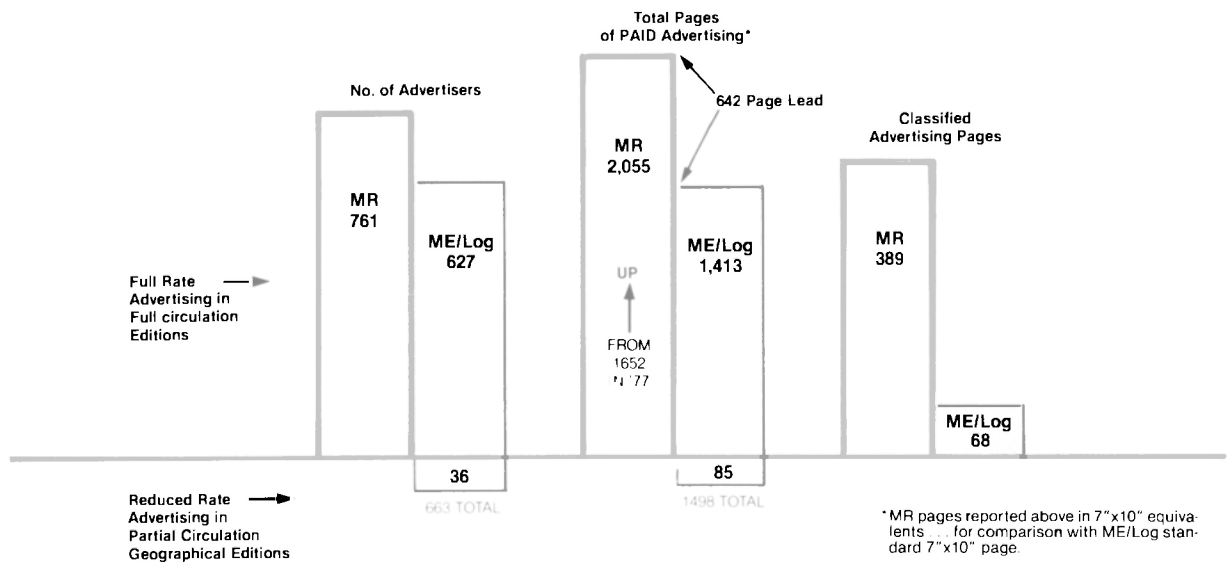

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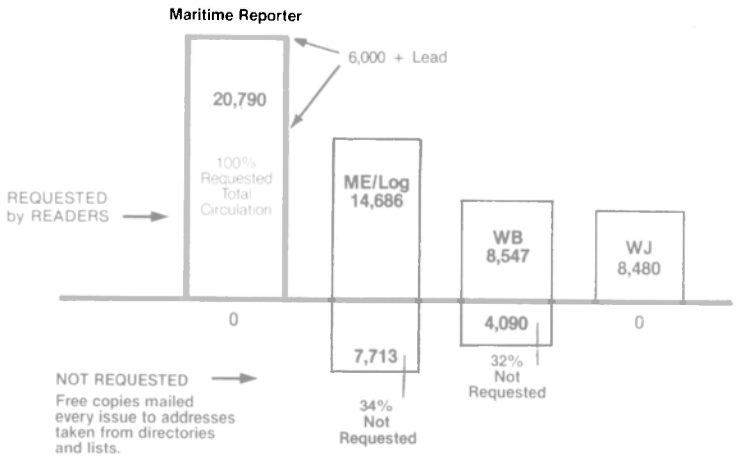

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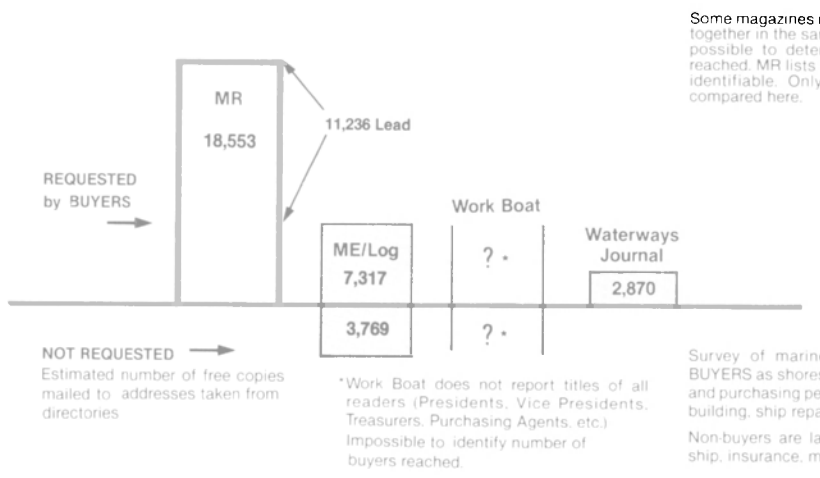

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SKF Opens U.S. Sales Office For Coupling Division —Literature Available

SKF Steel recently announced that sales of OK Shaft Couplings will be handled in the U.S. from the Coupling Division's newly established U.S. sales office in Avon, Conn.

Used in the marine industry for propulsion systems of all types worldwide, the OK Coupling is available in sizes ranging from 25 to 1,000 millimeters. It has a speedy disconnect and reconnect feature which makes it ideal for industrial applications where maintenance time must be kept to a minimum.

Company literature describes how the OK Coupling eliminates the need for keys or keyways. This makes it possible to reduce shaft diameters and to adjust easily for timing or phase-in of power transmissions. For a free copy of the literature,

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$14-Million Navy Contract For Ship Logistical Support Awarded Boeing Marine

Boeing Marine Systems, Seattle, Wash., has been awarded a $14-million contract containing both cost-plus-fixed-fee and cost-plus-award-fee elements to provide logistics support for the Navy's new six-ship squadron of patrol combatant missile ships. Work will be performed at Naval Air Station Key West, Florida (35 percent), and the Puget Sound region (65 percent). The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-83-C-2041).

Tracor Announces Changes To Satellite Navigators —Brochure Available

Tracor has announced some significant changes to its low-cost satellite navigators Bridgestar and Transtar. The most innovative is the power conservation feature, or "Sleep Mode." After each satellite pass, the receiver goes into a standby status and draws less than three watts power. Twenty minutes before the next satellite is due, the Bridgestar or Transtar "wakes up" to compute the next fix. The overall result is a dramatic reduction in total power usage.

At no increase in price, Tracor has also introduced complete point-to-point route planning along with an extremely flexible compass and log interface. Over 20 million operating hours in 1982 formed the basis for these latest changes.

For a free brochure describing the satellite navigators,

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Halter Delivers Catug To California And Hawaii Sugar Co.

Halter Marine, Inc. of New Orleans, La., recently delivered the Moku Pahu, a 113-foot 6-inch Catug, to the California and Hawaiian Sugar Co. of San Francisco, Calif.

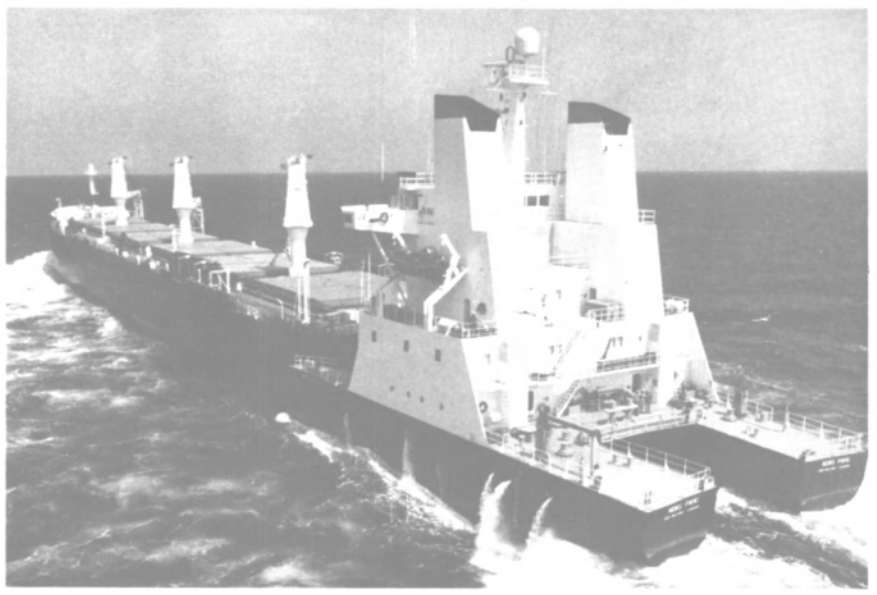
A Catug is the catamaran style propulsion unit in an integrated tug/barge system. When mated to its barge, the HSTC-1 built by Bath Iron Works, Bath, Maine, the two units have an overall length of 643 feet.

The Moku Pahu has an 84-foot beam and 39-foot depth. She is powered by two Colt Pielstick 14PC2V400 engines developing a total of 14,000 bhp. They drive two 18-foot diameter four-bladed propellers through Lufkin reverse/reduction gears with a ratio of 5.28:1. The combined unit displaces 30,000 tons loaded, and has a cargo capacity of 1,420,000 cubic feet.

On her first voyage from Hawaii to San Francisco she transported the largest single load of sugar ever delivered from the islands to the mainland. The integrated tug-barge unit is now in regular operation between Hawaii and the U.S. West Coast.

The vessel's fuel oil tanks hold 75,667 gallons of heavy fuel or 71,684 gallons of diesel fuel. Lube oil capacity is 19,252 gallons, fresh water capacity is 39,321 gallons, and ballast water capacity is 72,431 gallons.

Electrical power is provided by two Kato 600-kw generators driven by two Caterpillar D398 diesel engines. Heating on the tug is provided by a hot water/steam system and cooling is provided by a 72-ton Carrier chilled water system.



Two Colt Pielstick engines power the Moku Pahu.

The new vessel also includes an automatically controlled, unmanned engine room, made possible by state-of-the-art technology and equipment. Engine controls were supplied by the Tano Corporation and the generator control panel and switchboards were manufactured by Continental Electric Service Corp.

Communications and navigation aboard the vessel are facilitated by a Marisat satellite communications system and a Navidyne satellite navigator. A Raytheon Raycas collision avoidance system enhances safety.

The Moku Pahu is one of seven vessels in the Halter Catug program. Two others have been delivered previously to the Bethlehem Shipbuilding division of Bethlehem Steel Corporation, and four additional Catugs are under construction now at Halter for Bethlehem.

The Catugs are built at Halter's Chickasaw, Ala., division under a licensing agreement with Hvide Shipping, Inc., which holds the patents on the integrated system.

MOKU PAHU
Major Suppliers

Main Propulsion	(2) Colt Pielstick
Reduction Gears	(2) Lufkin
Propellers	Fergurson
Generators	(2) Kato
Bearings	Waukesha
Generator Engines	(2) Caterpillar
Panels	Continental Electric
Engine controls	Tano
Steering	Electro Hydraulic SSI
Purifiers	Alfa-Laval
Pumps	Durion, Aurora, Viking
Air Compressors	Worthington
Sanitation system	Microphor
Radar	Raytheon
CAS	Raytheon
Radio	McKay
Loran C	Navidyne
Depth Sounder	Raytheon
Tug-Barge System	Victoria Machine
Cranes	(2) Nautilus
Capstans	New England Trawler
Satellite Navigator	Navidyne
Gyrocompass	Sperry
Satellite Communications	Marisat
Windlass	New England Trawler
Coatings	International Paint

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For experienced loftsmen who are knowledgeable in Steel Construction Practices.
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900 HP MODEL BOW WITH PUSH KNEES
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KW GENERATOR UNITS LOA 66 FT.
BREADTH 21 FT. DRAFT 7 FT.
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Passenger/Freight vessel by Blount Marine, 64'-6 X 21'-0 X 7'-4, Twin GM 8V-71N 460 HP EA, 3:1 Allison Reduction Gears, 42 X 28 Columbia Hydrosonic Props, Keel Coolers, 22.5 KW gens, 35 passengers plus one 20'-0 container (20,000 lb). Excellent Condition $350,000

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46' Crew Boat Aluminum Construction by Neuville Boat, 46' X 15' X 5' Twin GM 8V-71N 440 HP EA, 2:1 Reduction gear, 28 X 32 3 blade props, Keel Coolers, 7.5 KW gen, 30 passenger. Like New $180,000

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Length	400'0"
Beam	99'6
Depth	25'0"
Deadrise	27°
Draft Light	3'11"
Draft Loaded	19'4
Transverse Bulkheads	5 O.T.
Length Bulkheads	3 O.T.
No. Tanks	20
Rolled Bilge	48" R
Mich. Bow	60' length
Sq. Raked Stern	80' length

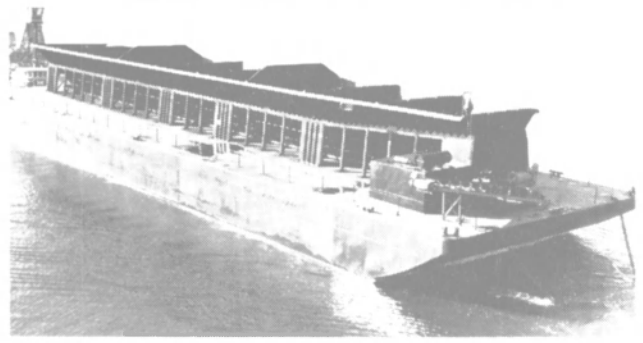
DECK CARGO

Open Deck Area	37,886 S.F.
Deck Load	1,500 P.S.F.
D.W.T.	15,800 L.T.

AS OIL BARGE

Oil Cargo	148,500 BBL's 21,000 L.T.
Cargo Piping	14" Mains 10" Suctions

Self Unloading Aggregate Barge



ZAG-501

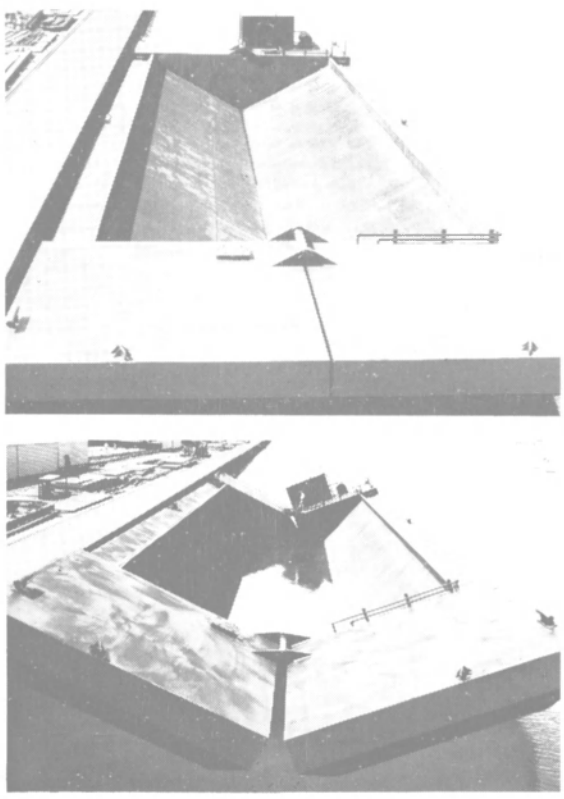
Length (O.A.)	248'- 0"
Beam	63'- 0"
Depth	16'- 0"
Displacement Light	1010 S.T.
Draft Light (F.W.)	2'- 7½"
Draft Loaded (F.W.)	11'- 8"
DWT	4000 S.T.
Diesel Electric Set	100 KV
Hopper Volume	2667 cu. yd

Hopper Unloading Gates: 27-36" x 36" Horiz. sliding gates w/individual hydr. controls.

Main Unloading Conveyer: 48" wide belt, 30 H.P. elect. motor, 250 ft./min. Max. disch. rate – 667 cu. yd./hr.

Transfer Conveyer: 42" wide belt, 10 H.P. elect. motor, 350 ft./min. off loading location – Stbd. side fwd. at 9 ft. above deck.

Hull Plating: Deck, side shell & bott. 9/16"



Split Type Self Dumping Scows

Built 1979. For sale, long or short term charters

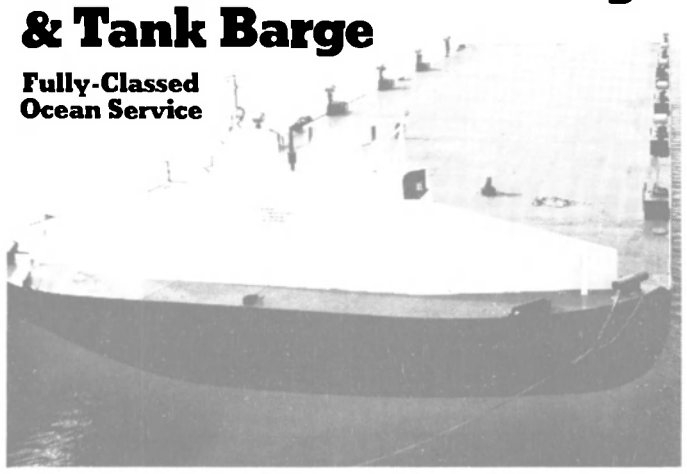
SPECIFICATIONS

ABS loadlined for USCG-approved offport dumping

Length (ML'D)	180'- 0"
Beam (ML'D)	50'- 0"
Depth of Mid-Body (ML'D)	14'- 0"
Hopper Length (ML'D)	128'- 0"
Level Hopper Volume	1421 cu. yd.
DWT @ d = 10.22 ft	1615 L.T.
Rake Lengths F. & A.	26'- 0"
Twin Skegs	
Stern & Fwd. Rake Decks Stepped up	2'- 0"
Engine GM 671	
Hydraulic Pumps (2) 12 GPM & 75 GPM	
Time To Open (Fully Closed to Fully Open)	6 Min. 5 Sec.
Time To Close	4 Min. 34 Sec.
Hopper Angle Fully Open	53.78°
Fuel Tank Capacity	445 Gal.
Hydraulic Cylinders (2 Fwd. & 2 Aft)	18" Diam. 120" Stroke
Plating	
Side	9/16"
Bottom	5/8"
Hopper	5/8"

Combination Deck Cargo & Tank Barge

Fully-Classed Ocean Service



230' x 60' x 15' Comb. Deck Cargo & Grade 'D' Tank Barge

Length O.A.	230'- 0"
Beam	60'- 0"
Depth	15'- 6
Deadrise	6°
Number of Tanks	10
Total Tank Volume @ 95%	24,000 BBL
Cargo Pumps	Two Twin Screw, Deleval IMO GTS-268-066-CBEM
Rating	1500 GPM, 1150 RPM, 100 PSIG Disch. Press., 5000 SSU
Location	Below Deck Pumproom in Fwd. Rake
Diesel Engines	Two Detroit Model 8V-71, 230 HP @ 1800 RPM
Location	Above Deck in Fwd. Deckhouse
Fuel Capacity	1400 Gal.
Fill & Disch. Connections	8" ANSI 150# FLG P/S
Heating Coils	2" Sch. 80 Pipe For Shore Steam
Hull Plating	Deck ½", Side Shell 3/8", Bott. 3/8", Shear Strake ½"
Deck Cargo Dwt. at Loadline	3900 S.T.

For additional information or to make an appointment to inspect, call or write:
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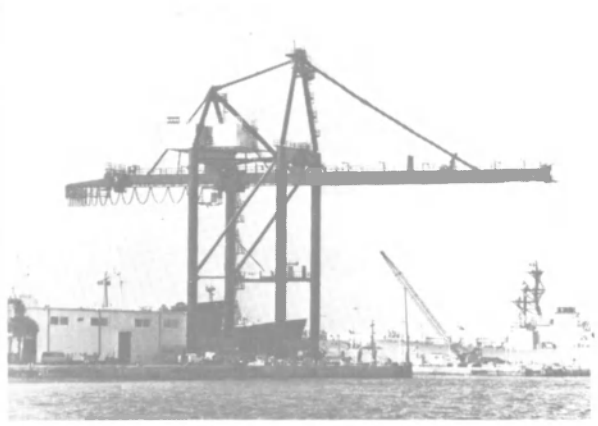

CUSTOM KONE CRANE — Kone Corporation of Finland custom-constructed this 30-ton-capacity container crane for the Port Everglades Authority, Florida. Specially designed to withstand extreme storm conditions, it was commissioned recently only one year after it was ordered.

Carrier Forrestal (CV 59) Begins SLEP At Philadelphia Navy Yard

The USS Forrestal in drydock No. 5 at the Philadelphia Naval Base where the 28-year-old aircraft carrier recently began her $698-million Service Life Extension Program, adding 15 more years to her service capability.

The Aircraft carrier USS Forrestal (CV 59) recently began an extensive, 28-month Service Life Extension Program (SLEP) at the Philadelphia Naval Shipyard at an estimated cost of $698.5 million. The Forrestal was selected for the program by its commissioning date and scheduling availability. The ship was commissioned October 1, 1955.

The Forrestal's propulsion machinery will be completely reworked and improved, and hull, tank, and piping systems will receive substantial repairs. Among the many modifications and alterations to the ship will be additional radar, communications equipment, anti-missile defense systems, and improved aircraft launch, recovery, and support systems.

The first carrier to undergo SLEP, the USS Saratoga (CV 60), left the Philadelphia Naval Shipyard in early February, following successful completion of the overhaul program. The $549.1-million program, which was completed on schedule, extended Saratoga's service life from 30 to 45 years.

BUYERS DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER/Engineering News. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all 24 issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR/EN assumes no responsibility for errors. **If you are interested in having your company listed in this Buyers Directory Section, contact John C. O'Malley at (212) 689-3266**

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Nance Industries, P.O. Box 1547, Beaumont, TX 77704-1547
York Division, Borg-Warner Corp., P.O. Box 1592, York, PA 17405

ANCHORS AND CHAIN
Baldt Incorporated, P.O. Box 350, Chester, PA 19016
William Pot B.V, Industriele Handelnij., Groothandelsgebouw, 45 Stationsplein, Rotterdam, 3004, Holland

ANODES—Cathodic Protection
American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
Engelhard Industries Division, 2655 U.S. Route 22, Union, NJ 07083
Kaiser Chemical, Div., of Kaiser Aluminum & Chemical Corp., 300 Lakeside Dr., Rm. 1128 KB, Oakland, CA 94643
Wilson Walton International Inc., 66 Hudson Street, Hoboken, NJ 07030

BASKET STRAINERS
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BEARINGS—Rubber, Metallic, Non-Metallic
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Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309
Thomson-Gordon Limited, 3225 Mainway, Burlington, Ontario, Canada L7M 1A6
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wisc. 53186

BLASTING—Cleaning—Equipment
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Aurand, 1270 Ellis Street, Cincinnati, OH 45223
Butterworth Systems Inc., 224 Park Ave., Florham Park, NJ 07932
Complete Abrasive Blasting Systems, 18250 68th Avenue South, Kent, WA 98031
E.I. DuPont De Nemours & Co., Inc., Starblast Division, Room X39186, Wilmington, DE 19898
Schmidt Mfg. Inc., P.O. Box 37, Fresno, TX 77545

BOILERS
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Foster Wheeler Boiler Corp., 110 S. Orange Ave., Livingston, NJ 07039

BROKERS
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Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y., N.Y. 10006

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Gulf Oil Trading Co., 1290 Ave. of the Americas, N.Y., N.Y. 10019
National Marine Service Inc. (Transport Div.), 1750 Brentwood Blvd., St. Louis, MO 63144

CARGO HANDLING EQUIPMENT
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Navire Cargo Gear (U.S.) Inc., 570 Rahway Avenue, Woodbridge, NJ 07095
Navire Cargo Gear International AB, Box 8991, s-402 74, Goteborg 8, Sweden
W.W. Patterson Company, 3 Riversea Road, Pittsburgh, PA 15233

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

CLAMPS
Band-It Company, P.O. Box 16307, Denver, CO 80216

CONDENSERS
G & W Acme Division, Gulf & Western Manufacturing Company, Jackson, MI 49202

CONTAINERS—Cargo Container Handling
Paceco Inc. (A division of Fruehauf), West Seaway Access Road, Gulfport, MS 39501

CONTRACTORS—LABOR
CISCO, 1528 E. Adams Street, Jacksonville, FL 32202

CONTROL SYSTEMS—Monitoring
American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
ARMTEC Industries, Inc., Manchester, NH 03103
Aris Electric Company, 327 Fourth St., Brooklyn, NY 11215
Autronica Marine USA, 280 Industrial Pkwy., Northvale, NJ 07647
Avicon Corp., 7750 East Redfield Rd., Scottsdale, AZ 85260
Electric Tachometer Corp., 68th & Upland Street, Philadelphia, PA 19142
Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913
Megasystems, Inc., 1075 N.W. 58th Street, Boca Raton, FL 33431
National Control Systems, Inc., 827 Hanley Industrial Court, St. Louis, MO 63144
Norcontrol, 135 Fort Lee Rd., Leonia, NJ 07605
Norske Telektron A/S, Drammensveien 126, Oslo 2, Norway
Pan American Systems Corporation, P.O. Drawer 400, Belle Chasse, LA 70037
Sybron Corp., Analytical Products Div., 221 Rivermoor St., Boston, MA 02132
Row Computer Automations, Inc., 1085 Rockaway Ave., Valley Stream, NY 11580
Tracor Marcon, Inc., 13433 N.E. 20th St., Bellevue, WA 98005
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062

COUPLINGS
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Appleton Machine Co., P.O. Box 22339, Appleton, WI 54911
Blohm & Voss Company, 55 Morris Avenue, Springfield, NJ 07081
Grove Manufacturing Co., P.O. Box 21, Shady Grove, PA 17256
HIAB Cranes & Loaders Inc., Rd. # 22 Interchange Place, York, PA 17402
M. P. Howlett, Inc., 410 32nd St., Union City, N.J. 07087
Marathon LeTourneau Offshore Co., 1700 Marathon Bldg., 600 Jefferson, Houston, TX 77002
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
Matson Terminals, Inc., P.O. Box 3933, San Francisco, CA 94119
National Crane Corp., 11200 North 148 St., Waverly, NE 68462
National Supply Company, 1455 West Loop South, Houston, TX 77027
Nautilus Crane, P.O. Drawer 1287, Metairie, LA 70004
Paceco Inc. (A division of Fruehauf), West Seaway Access Road, Gulfport, MS 39501
Superior-Lidgerwood-Mundy Corp., 1101 John Ave., Superior, WI 54880
Washington Crane, Div. of Ederer, Inc., P.O. Box 24708, Seattle, WA 98124

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General Hydraulics Corp., A Marotta Subsidiary, P.O. Box 3302, Huntsville, AL 35810
Marine Technical Associates, 195 Patterson Avenue, Little Falls, NJ 07424
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134

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General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, Massachusetts 02360
Granges Repair Service GmbH, Gutenbergring 64, 2000 Hamburg-Norderstedt, West Germany
Haynes Corporation, P.O. Box 179, Jackson, MI 49204
Twin Disc, Inc., 1328 Racine Street, Racine, WI 53403
UNIPAR Inc., 7210 Polson Rd., Hazelwood, MO 63042
Van der Horst Corp. of America, 314 Penn Ave., Olean, NY 14760

ELECTRICAL EQUIPMENT
Argo Marine, Div. of Argo Intl., 140 Franklin St., New York, N.Y. 10013
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

EMULSIFICATION SYSTEMS
Cleanodan A/S, N. American Agents, American United Marine Corp., 5 Broadway, Route 1, Saugus, MA 01906
Fire-Brite, Hoffert Manufacturing Company, Inc., 1700 East Church Street, Jacksonville, FL 32201

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Argo Marine, Div. of Argo Intl., 140 Franklin St., New York, N.Y. 10013
Band-It Division, Houdaille Industries, Inc., P.O. Box 16307, Denver, CO 80216
Comet Marine Supply Corp., 157 Perry St., New York, N.Y. 10014
Consafe Inc., P.O. Box 40339, Houston, TX 77040
Donn Corporation, 1000 Crocker Road, Westlake, OH 44145
b.v. Holmatro Industrial Equipment, P.O. Box 33, 4940 aa Raamsdonksveer, Holland
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon N.Y. 10550
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302
J.H. Menge & Company, Inc., P.O. Box 23602, New Orleans, LA 70175
John P. Nissen, Jr. Company, Glenside, PA 19038
Schnitzer-Levin Marine Co., 445 Littlefield Ave., So. San Francisco CA 94080
Softech, 460 Totten Pond Road, Waltham, MA 02154
Stal Laval Inc., 525 Executive Blvd., Elmsford, NY 10523
Strachan—Mackoe Corporation, P.O. Box M850, Hoboken, NJ 07030
Xorbox, Division of Greene & Kellogg, Inc., 290 Creekside Dr. Tonawanda, NY 14150

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Riley-Beoird, Inc., P.O. Box 1115, Shreveport, La. 71130

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Flexaust Company, 11 Chestnut Street, Amesbury, MA 01913
Hartzell Fan, Division of Castle Hills Corp., 901 S. Downing St., P.O. Box 919, Piqua, OH 45356
Joy Manufacturing Co., 338 So. Broadway, New Philadelphia, Ohio 44663
Mario Coil/Nuclear Cooling, Inc., P.O. Box 171, High Ridge, MO 63049
Tranter Inc., 6700 Finch Ave. West, Rexdale, Ontario, Canada M9W 5P5
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Intertrade Industries, Inc., 15301 Transistor Lane, Huntington Beach, CA 92649
Seaward International, Inc., 6269 Leesburg Ave., Falls Church, Va. 22044

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

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Warburg Paribas Becker, Inc., 2 First National Plaza, Chicago, Ill. 60670
Yegen Marine, P.O. Box 25504, Ft. Lauderdale, FL 33320

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New York Mercantile Exchange, Four World Trade Center, New York, NY 10048
Petrocon Marine & Industrial Chemical Corporation, 243 44th Street, Brooklyn, NY 11232
Rolfite Products Inc., 300 Broad Street, Stamford, CT 06901

FURNITURE
Bailey Joiner Co., Inc., 74 Sullivan Street, Brooklyn, N.Y. 11231
Comfort-Mate, Inc., 7988 NW 56th Street, Miami, FL 33166

GALLEY EQUIPMENT
Kiefer Corporation, W227 N546 Westmound Dr., Waukesha, WI 53186

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Lapeyre Stair, Inc., P.O. Box 50699, New Orleans, LA 70150
Rampmaster Inc., 9825 Osceola Blvd., Vero Beach, FL 32960
W & A Engineers, Inc., 4040 Veterans Highway, Metairie, LA 70002

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Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07207
MacGregor-Comarain, Inc., 135 Dermody St., Cranford, N.J. 07016
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696
Navire Cargo Gear (U.S.) Inc., 570 Rahway Avenue, Woodbridge, NJ 07095
Navire Cargo International AB, Box 8991, s-402 74, Goteborg 8, Sweden
Julius Mock & Sons, Inc., 20 Vesey Street, New York, NY 10007

HEAT EXCHANGERS
American Standard Inc., Heat Transfer Div., Buffalo, NY 14240

HULL CLEANING
Butterworth Systems Inc., 224 Park Ave., Florham Park, N.J. 07932
Phosmarin Equipment, 21, Boulevard de Paris, 13002 Marseille, France
Seaward Marine Services, Inc., 6269 Leesburg Pike, Falls Church, VA 22044
Underwater Hull Maintenance, 104 Waterview Dr., Crownsville, MD 21032

HYDRAULICS
Helmut Eller & Son, Inc., 2000 East Bay Street, Jacksonville, FL 32202
Hydranautics, 6338 Lindmar Drive, Goleta, CA 93017
Victor Fluid Power, 7527 Mitchell Rd., Eden Prairie, MN 55344

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Camar Corporation, P.O. Box 460, Worcester, MA 01613
Foster Wheeler Boiler Corp., 110 So. Orange Ave., Livingston, N.J. 07039
Maritime Protection A/S, N. American Agents, American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
Salwico Inc., 5 Marine View Plaza, Hoboken, NJ 07030

INSULATION—Cloth, Fiberglass
Bailey Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231

INSURANCE
Adams & Porter, 1819 St. James Place, Houston, Texas 77027
Adams & Porter, 1 World Trade Center, Suite 8433, New York, N.Y. 10048
Assurance Foreningen Skuld, P.O. Box 1376 Vika, Stortingagaten 18, N-OSLO 1, Norway
Midland Insurance Co., 160 Water St., New York, N.Y. 10038

JOINER—Watertight Doors—Paneling
Masonite Commercial Division, Dover, OH 44622
Pioneer Industries, Division of CORE Industries Inc., 401 Washington Avenue, Carlstadt, NJ 07072
Walz & Krenzer, Inc., 400 Trabold Road, Rochester, NY 14624

KEEL COOLERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
ACR Electronics, Inc., P.O. Box 2148, Hollywood, FL 33022
Browning Marine Inc., (Aqua Signal), 33W 480 Fabyan Parkway, Ste 105, West Chicago, IL 60185
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Oceanic Electrical Mfg. Co., 157 Perry Street, New York, N.Y. 10014
Oreck Corp., 100 Plantation Rd., New Orleans, LA 70123
Perko Inc., P.O. Box 6400D, Miami, Florida 33164
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209
Port Electric Supply Corp., 157 Perry Street, New York, N.Y. 10014

MACHINE TOOLS
Republic-Lagun Machine Tool Co., 1000 E. Carson St., Carson, CA 90749
Triboro Industries Inc., 173 Marine Street, New York, NY 10464

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
Granges Repair Service GmbH, Gutenbergring 64, 2000 Hamburg-Norderstedt 3, West Germany
Essex Machine Works, Essex, CT 06426
Jered Brown Brothers Inc., 56 S. Squirrel Road, Auburn Heights, MI 48057
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080
Triboro Industries Inc., 173 Marine Street, Bronx, NY 10464

METALS
Bayou Steel Corp., P.O. Box 5000, Laplace, LA 70068
Inland Steel Company, 30 West Monroe Street, Chicago, IL 60603
International Grating, Inc., 7625 Parkhurst, Houston, TX 77028
Lukens Steel Company, Coatesville, PA 19320
Millard Controlled Metals, 5 Louise Drive, Ivyland, PA 18974

MOORING SYSTEMS
Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110

NAME PLATES—BRONZE—ALUMINUM
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Highway (Suite 1300), Arlington, VA 22202
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Systems Engineering Corp., P.O. Box 4265, Virginia Beach, VA 23454
Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, Md. 20015
Art Anderson Associates, 148 First St., Bremerton, WA 98310
B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C., Canada V6S 2L2
The Borg/Luther Group, 876 Elm Ave., Carpinteria, CA 93013
Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
Bretagne ACB Corp., 344 Camp St., Suite 1000, New Orleans, LA 70130
Bristolcomp, P.O. Box 450, Bristol, RI 02809
C.D.I. Marine Co., Regency East, Ste 222, 9951 Atlantic Blvd., Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829
CADCOM, 107 Ridgely Ave., Annapolis, MD 21401
Childs Engineering Corp., Box 333, Medfield, Mass. 02052
John P. Colletti & Associates, P.O. Box 13378, Pittsburgh, PA 15243
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, Mass. 02026
Crane Consultants Inc., 15301 1st Ave., So. Seattle, Washington 98148
C.R. Cushing & Co., Inc., One World Trade Center, New York, N.Y. 10048
DLI Engineering Corp., 261 Madison Ave. South, Bainbridge Island, WA 98110
Norman N. DeJong & Associates, Inc., 1734 Emerson St., Jacksonville, Fla. 32207
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, Inc., 1725 Jefferson Davis Highway, Suite 700, Arlington, VA 22202
Donhaiser Marine, Inc., 11511 Katy Freeway, Houston, TX 77079
Parker C. Emerson & Associates, 17935 Cardinal Drive, Lake Oswego, Oregon 97034
Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, N.Y. 11050
Friede and Goldman Ltd., 935 Gravier St., New Orleans, LA 70112
GEOD Corporation, 73 Oak Ridge Road, NJ 07438
Giannotti & Associates, Inc., 703 Giddings Ave., Suite U-3, Annapolis, MD 21401
Gibbs & Cox, Inc., 119 West 31st Street, New York, NY 10001
John W. Gilbert Associates, Inc., 58 Commercial Wharf, Boston, Mass. 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
J.J. Henry Co., Inc., Two World Trade Center—Suite 9528, New York, N.Y. 10048
Hoffman Maritime Consultants Inc., P.O. Box 186, Glen Head, NY 11545
Hydronautics, Incorporated, 7210 Pindell School Road, Howard County, Laurel, Maryland 20810
Intramarine, Inc., P.O. Box 53043, Jacksonville, FL 32201
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Capt. Ernest James, 2849 Beavercrest Dr., Lorain, OH 44053
Jantzen Engineering Co., 6655-H Amberton Drive, Baltimore, Md. 21227
James S. Krogen & Co., Inc., 3333 Rice St., Miami, Fla. 33133
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
Nils Lucander, 5307 N Pearl St., Tacoma, WA 98407
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
John J. McMullen Associates, Inc., 1 World Trade Center, New York, N.Y. 10048
MacLear & Harris, Inc., 28 West 44 Street, New York, N.Y. 10036
Fendall Marbury, 1933 Lincoln Drive, Annapolis, MD 21401
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114
Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, N.Y. 11746
Marine Technical Associates, Inc., 95 River Rd., Hoboken, NJ 07030
George E. Meese, 194 Acton Rd., Annapolis, Md. 21403
Metritape, Inc., 33 Bradford Street, Concord, MA 01742
R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003
NKF Engineering Assoc., Inc., 8150 Leesburg Pike, Vienna, VA 22202
Nelson & Associates, Inc., 1405 N.W. 167th Street, Miami, FL 33169
Nickum & Spaulding Associates, Inc., 911 Western Ave., Seattle, WA 98104
Ocean-Oil International Engineering Corporation, 3019 Mercedes Blvd., New Orleans, La. 70114
Offshore Power Systems, 8000 Arlington Expressway, Jacksonville, FL 32211
PRC Guralnick, 5252 Balboa Ave., San Diego, CA 92117
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156
S.L. Petchul, Inc., 1380 S.W. 57th Avenue, Fort Lauderdale, FL 33317

Pilotage Consultants, Inc., P.O. Box 2046, New Hyde Park, NY 11040
M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013 and 657 Mission St., San Francisco, Calif.
Rothfuss Engineering Corp., P.O. Box 97, Columbia, MD 21045
Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Florida 33316
Seacor Systems Engineering Associates, Corp., P.O. Box 2030, 19 Cherry Hill Industrial Park, Perina Blvd., Cherry Hill, NJ 08003
Seaworthy Engine Systems, 36 Main Street, Essex, CT 06426
Seaworthy Engine Systems, 17 Battery Place, New York, NY 10004
George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007
Simmons Associates, P.O. Box 760, Sarasota, FL 33578
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
Richard R. Taubler Inc., 8 Columbia St., Milford, Del. 19963
Timsco, 622 Azalea Road, Mobile, AL 36609
Uhlig & Associates, Inc., 8295 SW 188th St., Miami, FL 33157
Wesley D. Wheeler Assoc., Ltd., 104 E. 40th St., Suite 206, New York, NY 10016
Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744
Wink Incorporated, 8020 Mayo Blvd., New Orleans, LA 70126
Yacht Design Institute, 9 Main St., Blue Hill, ME 04614

NAVIGATION & COMMUNICATIONS EQUIPMENT

AAT Communications Corporation, 1854 Hylan Blvd., New York, NY 10305
Alden Electronics, 1145 Washington St., Westborough, MA 01581
American Hydromath Co., Buckwheat Bridge Rd., Germantown, N.Y. 12526
Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080
Frank L. Beier Radio, P.O. Box 10307, Jefferson, LA 70181
Cybernet International, Inc., 7 Powder Horn Dr., Warren, NJ 07060
Dantronics Co., P.O. Box 204, Boca Raton, FL 33432
DEBEG Marine, Inc., 10 Manor Parkway, Salem, NH 03079
Electric Tachometer Corp., 68th & Upland Street, Philadelphia, PA 19142
Electro-Nav Inc., 840 Bond Street, Elizabeth, NJ 07201
EPSCO Marine, 550 Wholesalers Parkway, Harahan, LA 70123
Fleet Marine, 1820 N.E. 146th Street, North Miami, FL 33181
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
Griffith Marine Navigation, Inc., 134 North Avenue, New Rochelle, NY 10801
Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
ITT Mackay Marine, 2912 Wake Forest Road, Raleigh, N.C. 27611
Kongsberg North America Inc., 135 Fort Lee Road, Leonia, NJ 07605
Kongsberg Vapenfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway
Krupp Atlas-Elektronik, 241 Erie Street, Jersey City, NJ 07302
G.E. McKay Company (Dymek), 111 South College Avenue, Claremont, CA 91711
Magnavox Navigation Systems, 2829 Maricopa Street, Torrance, CA 90503
Maritel, Inc., 8230-R Telegraph Road, Odenton, MD 21113
Nav-Com, Inc., 9 Brandywine Drive, Deer Park, NY 11729
Navidyne Corp., 11824 Fishing Point Drive, Newport News, VA 23606
Northern Radio Co., 14975 N.E. 40th, Redmond, WA 98052
P. J. Plishner Marine, 2 Lake Ave. Ext., Danbury, CT 06810
Racal-Decca Marine, Inc., 4200 23rd Avenue West, Seattle, WA 98199
Radar Devices, Inc., 2955 Merced Street, San Leandro, CA 94577
Radio-Holland USA, Inc., One Allen Center, Suite 1000, Houston, TX 77002
Raytheon Marine Co., 676 Island Pond Road, Manchester, N.H. 03103
Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061
Rivertronics, P.O. Box 247, Godfrey, IL 62035
Robertson Auto Pilot, 135 Fort Lee Road, Leonia, NJ 07605
Selesmar S.p.A., Casella Postale 9, 50020 Montagnana Val Di Pesa, Firenze, Italy
Servo Corporation of America, 111 New South Road, Hicksville, NY 11802
Simrad, Inc., 2215 NW Market St., Seattle, WA 98107
Si-Tex Marine Electronics, P.O. Box 6700, Clearwater, FL 33518
Sperry Corporation, Great Neck, NY 11020
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Texas Instruments, Inc., P.O. Box 405, 3438, Lewisville, TX 75067
Tracor, Inc., Industrial Products Div., 6500 Tracor Lane, Austin, Texas 78721

OILS—Marine—Additives

Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001
Gulf Oil, New York District Sales Office (Domestic), 433 Hackensack Avenue, Hackensack, NJ 07601
Gulf Oil Trading Co., 1290 Ave. of Americas, New York, N.Y. 10019
Mobil Oil Corp., 150 East 42 Street, New York, NY 10017
National Fluid Separators, Inc., 1239 Hanley Industrial Court, St. Louis, MO 63144
Phoenix Oil Refiner Co., Inc., 330 Hill Ave., Nashville, TN 37210
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002
Texaco, Inc. (International Marine), 135 East 42nd St., N.Y., N.Y. 10017

OIL/WATER SEPARATORS

Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Biospherics Incorporated, 5001 Forbes Blvd., Lanham, MD 20801
Butterworth Systems Inc., 224 Park Ave., Florham Park, N.J. 07932
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
From Industrial, P.O. Box 33210, Tulsa, OK 74135
McTighe Industries Inc., 1615 Ninth Avenue, Suite 1 South, Bohemia, NY 11716
Sigma Treatment Systems, Merry Meadows, RD 1 Box 70, Chester Springs, PA 19425

PAINTS—COATINGS—CORROSION CONTROL

American Abrasive Metals, 460 Coit Street, Irvington, NJ 07111
Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754
Bywater Coatings, 1610 Engineers Road, Belle Chasse, LA 70037
"CONSOL" manufactured by Contact Paint & Chemical Co. Inc., 200 S. Franklintown Rd., Baltimore, MD 21223
Devoe Marine Coatings Co., P.O. Box 7600 Louisville, KY 40207
E.I. Dupont De Nemours & Co., Inc., Nemours Bldg. Rm. N-2504-2, Wilmington, DE 19898
Eureka Chemical Company, 234 Lawrence Avenue, So. San Francisco, CA 94080
Farboil, 8200 Fischer Road, Baltimore, MD 21222
Grow Group, Inc., 200 Park Ave., New York, NY 10017
Hempel Marine Paints, Inc., 65 Broadway, New York, NY 10006; P.O. Box 41, So. Houston, TX 77587; P.O. Box 10265, New Orleans, LA 70181
International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083
Jotun-Baltimore Copper Paint Co., 840 Key Highway, Baltimore, MD 21230
Magnus Maritec International Inc., 150 Roosevelt Pl., P.O. Box 150, Palisades Park, NJ 07650
Mobil Chemical Co., Maintenance & Marine Coatings Dept., P.O. Box 250, Edison, N.J. 08817
Palmer Products Inc., P.O. Box 8, Worcester, PA 19490
Selby, Battersby & Company, 5220 Whiby Avenue, Philadelphia, PA 19143

PETROLEUM SUPPLIES

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

PIER REPAIRS

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

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

Camlock Flange Sales Corp., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696
Hydro-Craft, Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063
Knights' Piping Inc., 5309 Industrial Road, Pascagoula, MS 39567
Kubota Ltd., 2-47, Shikit Suhigashi 1-Chome, Naniwa-Ku, Osaka 556-91, Japan
Metropolitan Plumbing Supply Corp., 5000 Second St., Long Island City, NY 11101
Penco Division/Hudson Engineering Co., P.O. Box 68, Bayonne, NJ 07002
Pioneer Valve & Fitting Co., Inc., 93 Seigel Street, Brooklyn, NY 11206
Sanchem, Inc., 1600 South Canal Street, Chicago, IL 60616
Selkirk Metalbestos, Box 19000, Greensboro, NC 27419
Stauff Corporation, 21-31 Industrial Park, Waldwick, NJ 07463

PLAQUES—BRONZE—ALUMINUM

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

PLASTICS—Marine Applications

Griffolyn Company, P.O. Box 33248, Houston, TX 77033
Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231

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

Alco Power Inc., 100 Orchard St., Auburn, N.Y. 13021
American Lohmann Corp., 1415 Chestnut Ave., Hillside, NJ 07205
Armco Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150
Bird Johnson Company, 110 Norfolk St., Walpole, Mass. 02081
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Caterpillar Engine Division, 100 N.E. Adams, Peoria, IL 61629
Colt Industries Inc. (Fairbanks Morse Engine Div.), 701 Lawton Avenue, Beloit, WI 53511
Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520
Combustion Engineering, Inc., Windsor, Connecticut 06095
Cummins Engine Company, Inc., 40642, 1000 Fifth Street, Columbus, IN 47201
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Diesel Marine International, Ltd., c/o NORSHIPCO, P.O. Box 2100, Norfolk, VA 23501
Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505
Escher Wyss GmbH, (Member Sulzer Group), Ravensburg, Germany
General Electric Co., Diesel Power Products, 2901 E. Lake Rd., Erie, PA 16531
General Motors, Electro-Motive Division, LaGrange, IL 60525
George Engine Company, Inc., Lafayette, LA
Jacuzzi Bros. Division, P.O. Box 3533, Little Rock, AR 72203
Krupp Mak Diesels, Inc., 4329-33 Di Paolo Center, Glenview, IL 60025
M.A.N.-B&W Diesel, 2, Ostervej, DK-4960 Holeby, Denmark
MTU of North America, One E. Putnam Ave., Greenwich, CT 06830; 10450 Corporate Dr., Sugarland, TX 77478; 2945 Railroad Ave., Morgan City, LA 70203; 180 Nickerson St., Seattle, WA 98109; 1730 Lynn St., Arlington, VA 22209
Mapeco Products, Inc., 20 Vesey St., New York, NY 10007
Maritime Industries, Ltd., 6307 Laurel St., Burnaby, B.C. Canada V5B 3B3
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA 70037
Omnithruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
Penske GM Power, Inc., 180 Route 17 South, Lodi, NJ 07644
Port Electric Turbine Div., 155-157 Perry St., New York, N.Y. 10014
Propulsion Systems, Inc., 21213 76th Ave. So., Kent, WA 98031
SACM (Societe Alsacienne De Constructions Mechaniques De Mulhouse) 1, Rue De La Fonderie, Boite Postale 1210, 68054 Mulhouse Cedex, France
Schottel of America, Inc., 8375 N.W. 56 Street, Miami, Fla. 33166
Skinner Engine Company, P.O. Box 1149, Erie, PA 16512
Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland
Tacoma Boat Co./Escher Wyss, 1840 Marine View Dr., Tacoma, WA 98422
Transamerica DeLaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621
Transamerica Delaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, N.J. 08650
Triconn Corporation, P.O. Box 149, Redding, CT 06875
Turbine Specialties, Inc., P. O. Box 207, West State Street Road, Salina, KS 67401
Voith Schneider America, 159 Great Neck Rd., Ste 200, Great Neck, NY 11021
Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072
Waukesha Engine Division, Waukesha, WI 53187
ZF of North America, Inc., 3225 Commercial Avenue, Northbrook, IL 60062
ZF of North America, Inc. (Motive Power Corporation, P.O. Box 365, Mineola, NY 11501)

PUMPS—Repairs—Drives

Barco Corporation, 16 Bahama Circle, Tampa, FL 36606
EMMI Corporation, P.O. Box 955, Flemington, NJ 08822
FMC Corporation, Pump Division, 326 S. Dean Street, Englewood, NJ 07631
Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
Naniwa Pump, c/o Maritime Equipment Inc., P.O. Box 537, Flemington, NJ 08822
Penco Division/Hudson Engineering Co., P.O. Box 68, Bayonne, NJ 07002
Transamerica Delaval, IMO Pump Division, P.O. Box 447, Monroe, NC 28110
Warren Pumps Division, Bridges Avenue, Warren, MA 01083
Wilden Pump & Engineering Co., 22060 Van Buren St., P.O. Box 845, Colton, CA 92324
Worthington Group-McGraw Edison Co., 270 Sheffield Street, Mountainside, NJ 07092

REFRIGERATION—Refrigerant Valves

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

ROLLING SYSTEMS

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

ROPE—Manila—Nylon—Hawsers—Fibers

American Mfg. Co., Inc., Willow Avenue, Honesdale, Pa. 18431
Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008
Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110
Tubbs Cordage Company, P.O. Box 709, Orange, CA 92666

RUDDER ANGLE INDICATORS—STEERING

Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
Wm. E. Hough Company, 1129 NW Ballard Way, Seattle, WA 98107
Robertson, 135 Fort Lee Rd., Leonia, NJ 07605

SAFETY EQUIPMENT

Datrex, 3795 N.W. 25th Street, Miami, FL 33142
Elkhart Brass Manufacturing Co., Inc., P.O. Box 1127, Elkhart, IN 46515

SANITATION DEVICES—Pollution Control

Argo Marine Pollution Systems Division, 140 Franklin St., New York, N.Y. 10013
Chapman Engineers (Omnipure Division), 6101 Southwest Freeway, Suite 100, Houston, TX 77057
Effluent Technology Corporation, P.O. Box 2094, Tacoma, WA 98401
Marine Moisture Control Co., Inc., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696
Marland Environmental Systems, Inc., N. Main Street, Walworth, WI 53184
National Sanitation Foundation, P.O. Box 1468, Ann Arbor, MI 48105
St. Louis Ship FAST Sewage Systems, 611 East Marceau St., St. Louis, Mo. 63111

SCAFFOLDING EQUIPMENT—Work Platforms

Patent Scaffolding Co., One Bridge Plaza, Fort Lee, NJ 07024
Swiss Fabricating Inc., Camp Horne Rd., Emsworth, Pittsburgh, PA 15237
Waco Ladder & Scaffolding Co., Inc., 4315 41 St., P.O. Box 126, Brentwood, MD 20722

SHACKLES

West Footscray Engineering Works P/L, 52 Cross Street, West Footscray, Melbourne, Victoria, 30 12. Australia

SHAFT SEALS, REVOLUTION INDICATOR EQUIPMENT

Bird-Johnson Co., 100 Norfolk St., Walpole, MA 02081
Crane Packing Company, 435 Regina Dr., Clarksburg, MD 20734
Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Penco Division/Hudson Engineering Co., P.O. Box 68, Bayonne NJ 07002

SHIPBREAKING—Salvage

The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

SHIPBUILDING STEEL

Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004

SHIPBUILDING—Repairs, Maintenance, Drydocking

A.D.M. (Amsterdam Drydock Mfg.), Moatschappij bv, P.O. Box 3006, 1003 AA, Amsterdam, Holland
Arsenale Triestino S. Marco, Passeggio S. Andrea 11, 34143 Trieste Italy
Asmar Shipyards Co., Astilleros y Maestranzs de la Armada, Prat 856, Piso 14, Casilla 150-V, Valpariso, Chile, S.A.
Astilleros Balboa, S.A., c/o Jackson Marine Corp., 17 Battery Place, New York, NY 10004
Astilleros Unidos de Veracruz, S.A., San Juan de Ulua S/N, Apdo. Postal 647, Veracruz, Ver., Mexico
Ateliers et Chantiers de Bretagne — ACB, 44040 Nantes Cedex, France
Atlantic Dry Dock, P.O. Box 276, Ft. George Island, Jacksonville, FL 32226
Atlantic Marine Inc., P.O. Box 138 Ft. George Island, Jacksonville, FL 32226
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150
Bay Shipbuilding Corp., 605 North 3rd Ave., Sturgeon Bay, WI 54235
BFC Marine Services, Inc., 25 Fifth St., Brooklyn, NY 11231
Bergeron Industries Inc., P.O. Box 38, St. Bernard, La. 70085
Bethlehem Steel Corp., Bethlehem, PA 18016
Blohm & Voss Company, 55 Morris Avenue, Springfield, NJ 07081
Bludworth Bond Shipyard Inc., P.O. Box 5065, Houston, TX 77012
Boeing Marine Systems, P.O. Box 3707, Mail Stop 14-11, Seattle, WA 98124
Burmeister & Wain Skibsvaerft A/S, P.O. Box 2122, Refshaleoen-1015 Copenhagen K-Denmark
Burrard Yarrows Corporation, P.O. Box 86099, North Vancouver, B.C., Canada
Burton Shipyard, Inc., P.O. Box 3636, Port Arthur, TX 77640
Caddell Drydock & Repair Co., P.O. Box 327, Foot of Broadway, Staten Island, NY 10310
Cantieri Navali Luigi Orlando, Piazza Mazzini, 92-57100 Livorno, Italy
Cantieri Navali Riuniti, Via Cipro, 11, 16100 Genova, Italy
Carrington Slipways Pty, Ltd., Old Punt Road, Tomago, N.S.W., Australia 2322
China Shipbuilding Corp., 6th Floor, 20 PA Teh Road, Sec. 3 Taipei, Taiwan (105) Republic of China
Conrad Industries, P.O. Box 790, Morgan City, La. 70380
Curacao Drydock Company Inc., 26 Broadway, Suite 741, New York, NY 10004
Daewoo Shipbuilding & Heavy Machinery Ltd., Ayangri, Changsung-PO, Koje-Kun, Kyungnam, Korea
Dorbyl Ltd., Military Road, 1 Industrial Sites, West Bank, 5201 East London Republic of South Africa
Dravo Steelship Corp., R.4, Box 167, Pine Bluff, Ark. 71602
Eastern Marine, Inc., P.O. Box 1009, Panama City, FL 32401
FMC Corp., Marine & Rail Equipment Div., 4700 N.W. Front Ave., Portland, Oregon 97208
Faustug Marine Corporation, 601 Sawyer, Suite 201, Houston, TX 77007
Gladding-Hearn Shipbuilding Corp., 1 Riverside Ave., Somerset, MA 02725
Golden Gulf Marine Operations, Inc., 814 Howard Avenue, New Orleans, LA 70151
HBC Barge, Inc., Grant Building, Pittsburgh, PA 15219
Halifax Industries Ltd., P.O. Box 1477, Halifax, Nova Scotia, Canada, B3K 5H7
Halter Marine, Inc., P.O. Box 29266, New Orleans, La. 70189
Havre de Grace, Havre de Grace, Md.
Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong
Hudson Shipbuilders, Inc., P.O. Box Q, Pascagoula, MS 39567
Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, Korea
I.N.M.A. S.p.A., 19100 La Spezla, v. le S. Bartolomeo 362, Italy
Jeffboat, Inc., Jeffersonville, Ind. 47130
Keppel Shipyard Limited, 325 Telok Blangah Road, P.O. Box 2169, Singapore 0409
Koch Ellis Barge & Ship Service, P.O. Box 187, Westwego, LA 70094
Leevac Corporation, P.O. Box 2607, Morgan City, LA 70381
Lisnave Estaleiros Navais De Lisboa, P.O. Box 2138, Lisbon, Portugal
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134
McDermott, Incorporated, 1010 Common Street, New Orleans, LA 77227
MacGregor Land & Sea, Inc., 135 Dermody Street, Cranford, NJ 07016
John Manly Shipyards, 2050 East Kent Ave., Vancouver, B.C. V5P 2T2, Canada
Marathon LeTourneau Offshore Co., 1700 Marathon Bldg., 600 Jefferson, Houston, TX 77002
Marinette Marine Corp., Ely St., Marinette, WI 54143
Matton Shipyard Co., Inc., P.O. Box 645, Cohoes, New York 12047
Misener Industries, Inc., 5353 Tyson Avenue, P.O. Box 13625, Tampa, Fla. 33681
Monark Boat Co., P.O. Box 210, Monticello, Ark. 71655
Moran Shipping Agencies, 10 Jefferson Blvd., Warwick, RI 02888
Moss Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552
Nashville Bridge Company, P.O. Box 239, Nashville, TN 37202
National Marine Service (Shipyard Division), P.O. Box 38, Hartford, IL 62048
National Steel & Shipbuilding Corp., San Diego, Calif. 92112
Newpark Shipbuilding & Repair, Inc., 502 Cypress Street, Houston, TX 77012
Newport News Shipbuilding & Dry Dock Co., 4101 Washington Ave., Newport News, Va. 23607
O.A.R.N. (Officine Allestimento-Riprazioni Navi), P.O. Box 1395, Genoa, Italy 16100
Overseas Shipyards, Inc., 21 West St., New York, NY 10006
Paceco Inc. (A division of Fruehauf), West Seaway Access Road, Gulfport, MS 39501
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Progressive Shipbuilders & Fabricators, Inc., P.O. Box 9130, Houma, LA 70361
Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22
Puerto Rico Drydock & Marine Terminals, Inc., P.O. Box 2209, San Juan, Puerto Rico 00903
Rauma-Repola, 26100 Rauma 10, Finland
Samsung Shipbuilding & Heavy Industries Co., Ltd., Samsung Main Bldg. 250, 2Ka, Taepyong-ro, Chung-ku, Seoul, Korea
Savannah Shipyard Co., P.O. Box 787, Savannah, GA 31402
Southbay Boat Inc., P.O. Box 13308, San Diego, CA 92113
Southwest Marine, Inc., P.O. Box 13308, San Diego, Ca 92113
Swiftships Inc., P.O. Box 1908, Morgan City, LA 70380
Tacoma Boatbuilding Co., Inc., 1840 Marine View Drive, Tacoma, WA 98422
Thomas Marine, 37 Bransford St., Patchogue, NY 11772
Thunderbolt Marine, Inc., P.O. Box 5628, Savannah, GA 31404
Todd Shipyards Corp., 1 State St. Plaza, New York, N.Y. 10004
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Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 28, N5201 Oslo, Norway
Tracor Marine, P.O. Box 13107, Port Everglades, Fla. 33316
Umpqua Marine Way, Inc., Port Industrial Park, Reedsport, OR 97467
Union Dry Dock & Repair Co., Foot of Pershing Road, Weehawken, N.J. 07087
Valmet Oy, Helsinki Shipyard, Laivanrakentajantie 2, P.O. Box 910 SF-00101 Helsinki 10, Finland
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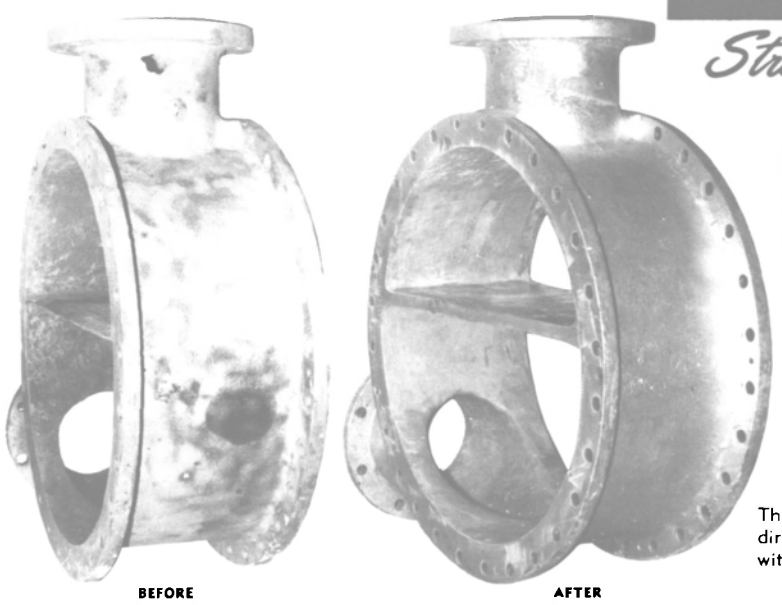

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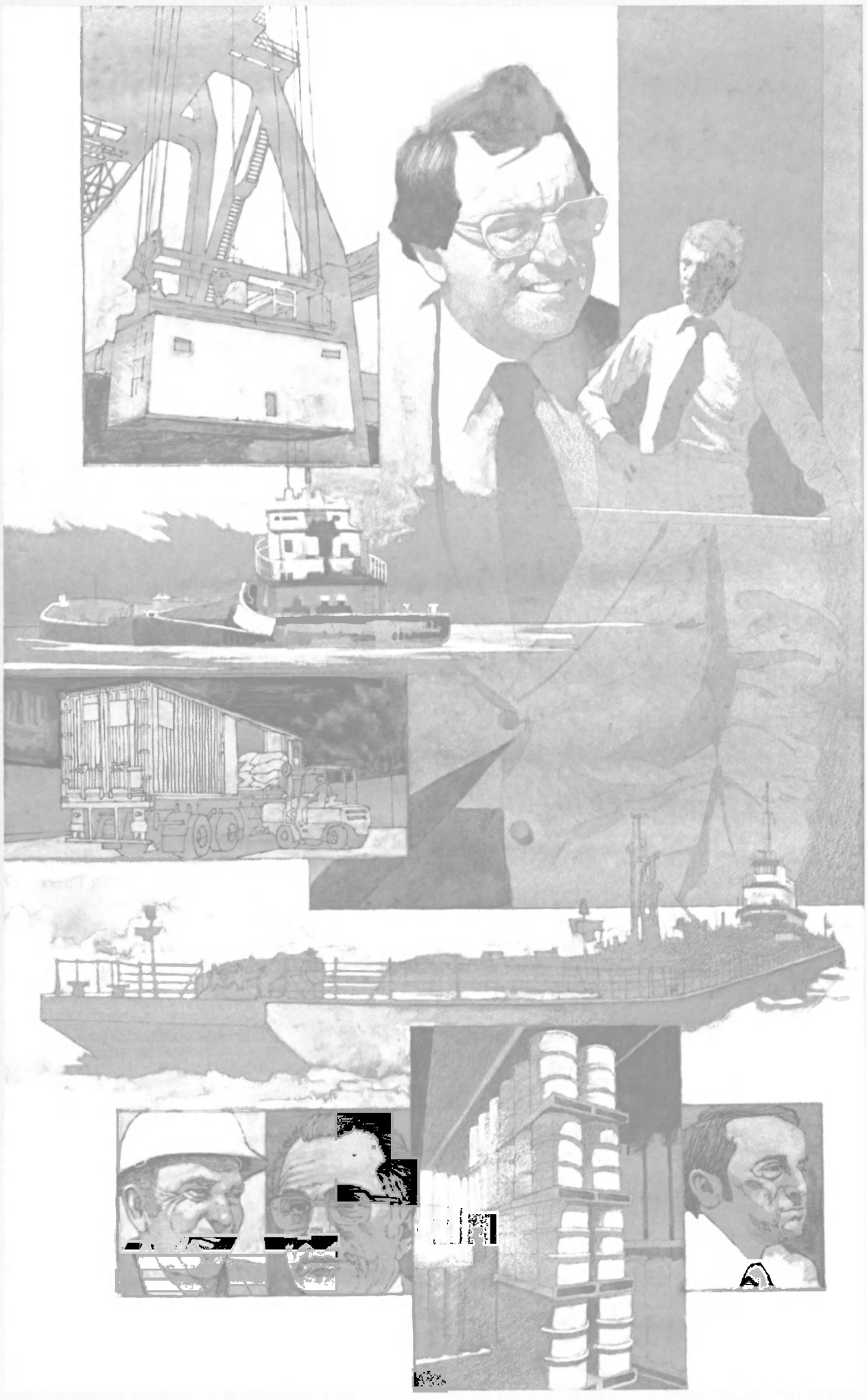

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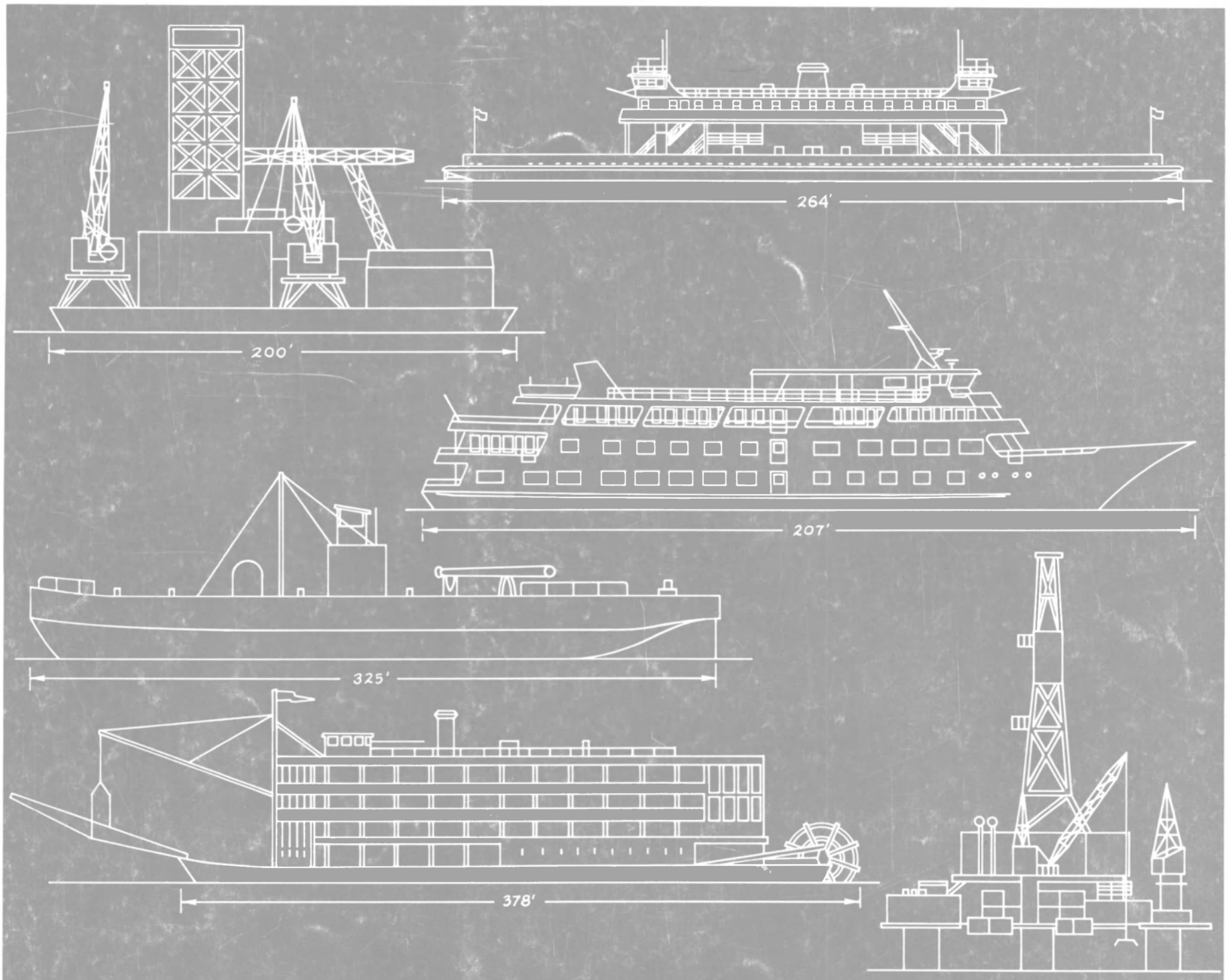

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