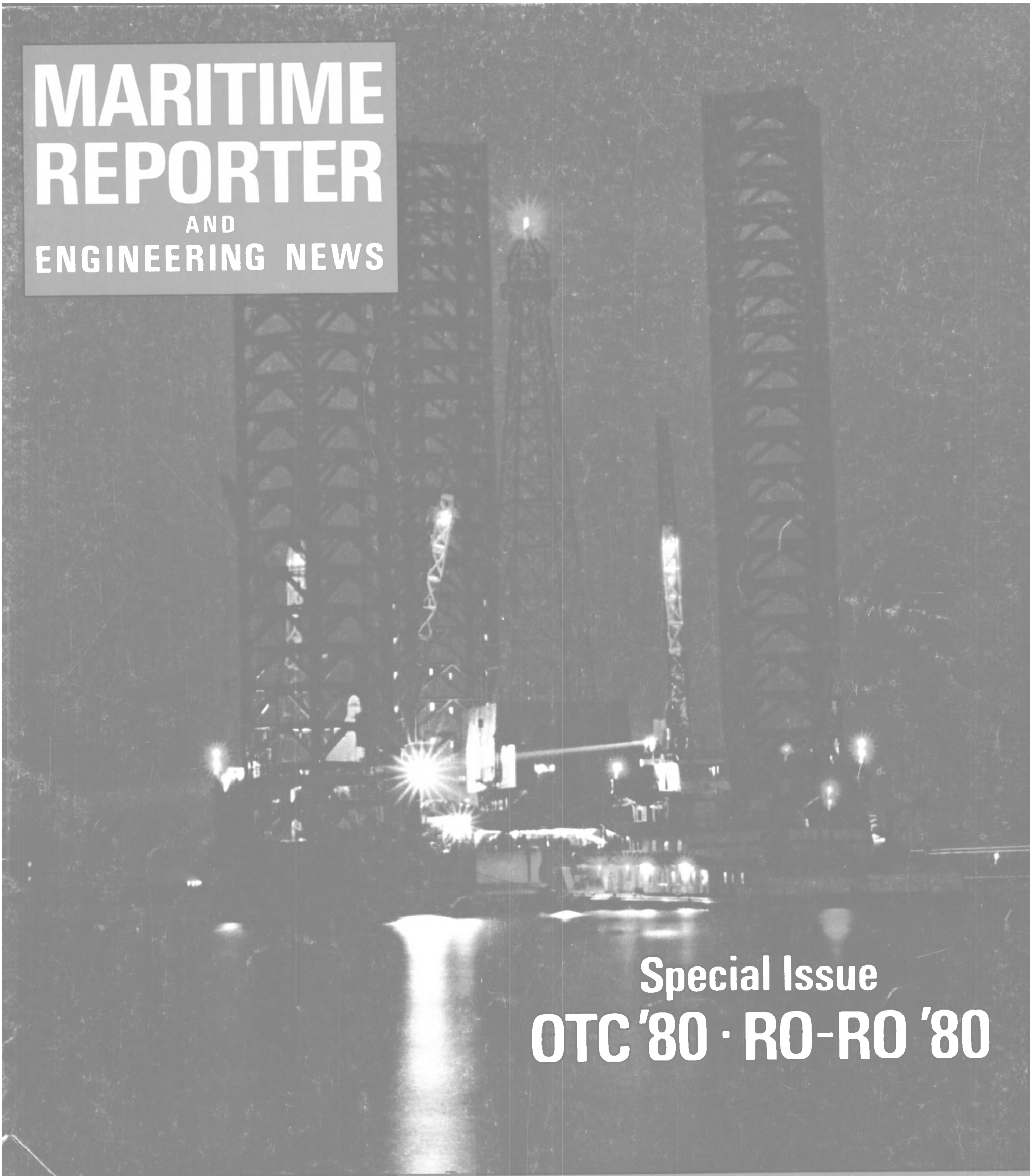
MARITIME
REPORTER
AND
ENGINEERING NEWS



Special Issue
OTC '80 · RO-RO '80

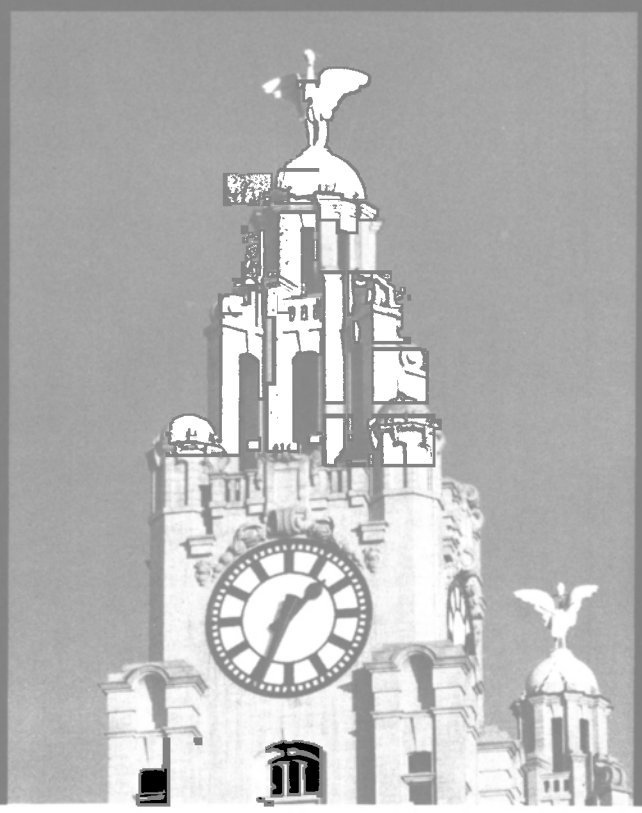
Photo courtesy Marathon LeTourneau Offshore Company

Offshore Technology Conference–Houston
(SEE PAGE 12)

Ro-Ro 80–Monaco
(SEE PAGE 38)

APRIL 1, 1980

Once you spy the Liver Birds, you're not far from Gulf.



You're a blip on Her Majesty's radar long before you raise the coastline. But once you do, Liver House is unmistakable on the distant skyline.

You pass Wallasey and head upriver. And soon, you can read the clocks with the famous mythical Liver Birds perched atop them.

The Royal Liver Building. Without its reassuring Victorian bulk, the Merseyside pierhead scene just wouldn't be complete.

Liverpool. Still another port where you'll find premium Gulf marine lubricants like Gulf Veritas AC30.

This is an alkaline-type detergent lubricating oil, for use in the crankcase systems of slow-speed two-stroke crosshead diesel engines where an oil of this type is required for optimum engine performance.

Gulf Veritas AC30 effectively neutralizes the acidic products of combustion, reduces piston-cooling space and engine deposits, increases load-carrying ability. And it has excellent oxidation stability with long crankcase oil life.

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McAllister

Title XI Aid Sought For Installation Of Inert Gas Systems

Margate Shipping Co., Philadelphia, Pa., has applied for a Title XI guarantee to aid in financing the installation of inert gas systems in its three 38,300-dwt tankers, Coronado, Chelsea, and Cherry Valley.

National Steel and Shipbuilding Co., the original builder of the three ships, will accomplish the installation at an estimated cost of $4.1 million. The requested guarantee is for 87½ percent of the total cost.

Sacramento Opens New Container Yard

A new container yard and container freight station have been opened at Sacramento, Calif., it has been announced by port director **Melvin Shore**. The new facilities are described as another step toward resumption of the container barge service which shuttles containerized cargo between Sacramento and San Francisco Bay area ocean terminals. By taking advantage of the port's terminal status, shippers using the service can save the cost of trucking to and from the bay region.

Shipasia '81— Exhibition & Conference To Be Held In Hong Kong

Eurotech Managements (Hong Kong) Ltd. have announced the organization of a major maritime exhibition and conference, Shipasia '81, to be presented October 13-17, 1981, at the Ocean Terminal, Hong Kong.

Shipasia '81 will have approximately 80,000 square feet of exhibit space, and is sponsored by the Hong Kong Shipowners Association, whose members own or manage over 40 million dwt of ships.

The Ocean Terminal is located in the heart of the Hong Kong shipping business, near the airport, and is close to many major hotels. A large local attendance is expected, together with substantial international participation.

For further information, contact **Peter Johnson**, Shipasia '81, 6006 Bellaire Boulevard, Suite 100, Houston, Texas 77081, telephone (713) 666-5188, TWX (910) 881-5777.

MARITIME REPORTER AND ENGINEERING NEWS

(USPS 016-750)

No. 7 Volume 42

107 EAST 31st STREET
NEW YORK, N. Y. 10016
(212) 689-3266

ESTABLISHED 1939

Maritime Reporter/Engineering News is published the 1st and 15th of each month by Maritime Activity Reports, Inc. Controlled Circulation postage paid at Waterbury, Connecticut 06701.

Postmaster send notification (Form 3579) regarding undeliverable magazines to Maritime Reporter/Engineering News, 107 East 31st Street, New York, N.Y. 10016.

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c/o Grant Johnson, Executive Vice President

TMP Retained By Carnival Cruise Lines To Supervise Liner Construction Project

Carnival Cruise Lines, Miami, Fla., has retained Technical Marine Planning (Group) Ltd., London, England, as consulting naval architects and marine engineers to supervise the construction of a passenger cruise liner being built by Aalborg Vaerft, Denmark.

Ordered last July, the passenger cruise liner is modern in design and appearance. The 200-meter-long (656-foot) vessel will have a capacity of 1,420 passengers in over 500 air-conditioned cabins, each with TV and private facilities. It is being built for cruise service, with emphasis on high standards for the safety, comfort and entertainment of passengers. Public areas include saloon-bar

Model of the 656-foot, 26,600-horsepower cruise liner to be built in Denmark for Carnival Cruise Lines, Miami, Fla.

lounges, three swimming pools, a discotheque, casino, and a 700-seat dining saloon. The vessel will be manned by a crew of 530.

The machinery design will provide bridge control of the unmanned engine rooms, and extensive automation. The propulsion plant consists of two Sulzer slow-speed diesel engines developing a total of 26,600 bhp, each driving a controllable-pitch propeller, giving the vessel a cruising speed of 20 knots. Two shaft generators of 2,500 kw each provide the vessel's electrical requirements at sea. Three diesel alternator sets generate electrical power in port. The vessel will be equipped with a folding fin type stabilizer and a bowthruster.

Gulf Oil Foundation Gives $2,500 Grant To Webb Institute

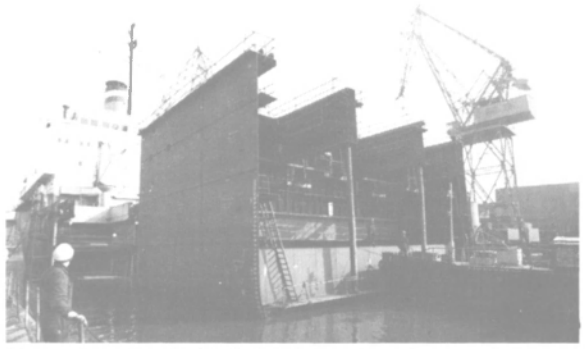
Rear Adm. **Charles N. Payne**, president of Webb Institute, observes **Michael D. Comens**, Webb '72, naval architect with Gulf Transportation Co., present a $2,500 check to **Florence Spencer**, assistant for development at Webb.

Webb Institute of Naval Architecture, Glen Cove, N.Y., recently announced receipt of a $2,500 Departmental Assistance Grant from the Gulf Oil Foundation.

College officials said that the Grant will be used for the Scholarship Program of Webb Institute to further its education in naval architecture and marine engineering.

Other phases of Gulf's Aid to Education Program include individual undergraduate scholarships, graduate fellowships, employee gift matching, capital grants, and various special grants.

Hapag-Lloyd Converting Three Freighters To 546-Foot Semicontainerships



Hapag-Lloyd's M/V Schwabenstein shown above at the Thyssen Nordseewerke GmbH, Emden, receiving a 49-foot-long midships section as part of her conversion to a semicontainership.

West Germany's Hapag-Lloyd is having three of its freighters converted into semicontainerships at the Thyssen Nordseewerke GmbH, Emden.

The vessels, M/V Schwabenstein, M/V Friesenstein, and M/V Holstenstein, will be cut in two near hold 4, and a new 49-foot section inserted. The conversion will lengthen each ship from 497 feet to 546 feet, increasing its capacity from 12,790 dwt to 16,400 dwt. Each ship will have a capacity of 316 TEUs. Their service speed will be reduced from 22.5 knots to 19 knots as a result of the conversion.

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Keep the boat working

Ring groove fill normal. Number 3 and 4 lands clean.

Liner shows little wear. Honing marks still visible.

Silver trunnion bearing shows normal wear of lead flashing.

Valve deck illustrates cleanliness typical of both engines.

The MV "Mana" does-for Dillingham. Her 12 645 E6 engines, overhauled at 16,753 hours, looked good for many more-on Caprinus® Oil.

During late 1976, the then new MV Mana's engines were filled with high alkalinity *Caprinus** T Oil. Then, in 1978, the switch was made to the even more improved *Caprinus* R Oil. Since 1976 the engines have racked up 16,753 hours before *scheduled* overhaul — without a *single* power-pack replacement. The consensus? The engines looked good enough for 20,000 hours — probably even longer.

Dillingham Tug & Barge Corporation *needs* reliability — there are no repair stations between the Hawaiian islands and the "mainland" or throughout the South Pacific where they operate. Dillingham Tug & Barge runs a top-notch maintenance program with *Caprinus* R to keep the boats working.

Both engines were exceptionally clean. Top ring side clearance averaged 0.013" and the top rings were rated at 2 to 2A — which means the grooves were visible on the top ring on about half the pistons. Silver trunnion bearings were good. Overall engine reliability as shown by maintenance records was excellent.

Low wear rates were especially evident in the top ring side clearances, ring gap clearances, ring faces, piston ring groove widths (pistons were reusable without machining for oversize rings), liners and piston skirts. Shell's premium MVI base oil keeps ring groove deposits soft, friable so deposits are worked out by ring action. Rings compress into the grooves and traverse the ports without breaking or chipping. The result is low ring and liner wear rates.

In addition, Dillingham's use of *Caprinus* R in its Fairbanks Morse engines has eliminated the former expensive task of intake and exhaust port cleaning of those engines three times a year.

Caprinus R Oil is Shell's one oil for big medium-speed marine diesels. Its high alkalinity reserve and dispersancy with Shell's premium MVI base oil fight corrosive wear, keep engines clean and deposits soft — so that normal engine operation keeps deposits from building up. It's been proven — in ALCO, EMD and Fairbanks Morse, as well as other engines.

For more information write: Shell Oil Company, Manager, Commercial Communications, One Shell Plaza, Houston, TX 77002.

* *Caprinus* is a trademark and is used as such in this writing.

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Location: Mobile River, Mile 1.5
Address: Fairhope 36532
Phone: (205) 433-4972
Radio: Ch 16, VHF
ARKANSAS
Helena
Helena Fuel & Harbor Service, Inc.
Location: Mississippi Service, Inc. Mississippi River, Mile 661 Riverfront & Bridge Road
Phone: (501) 338-8321
Radio: Ch 16
CALIFORNIA
Oakland
Bay Area Petroleum, Inc.
Location: 421 23rd Ave.
Phone: (415) 534-4517
San Diego
Tuna Clipper Marine
Location: San Diego Harbor Foot of Crosby Street
Phone: (714) 232-1838
San Pedro
San Pedro Marine, Inc.
Location: Berth 74
Phone (213) 832-1339
FLORIDA
Jacksonville
See Savannah Oil & Chemical Savannah, Ga.
Port Everglades
Belcher Oil Company
Location: Port Everglades 2401 Eisenhower Boulevard
Address: Fort Lauderdale
Phone: (305) 525-4261
Tampa
Belcher Oil Company
Location: Tampa Bay
Phone: (813) 247-4572, 247-4573
West Palm Beach
Belcher Oil Company
Location: Port of Palm Beach 1733 Hill Avenue
Phone: (305) 848-1495
GEORGIA
Brunswick
See Savannah Oil & Chemical Savannah, Ga.
Savannah
Belcher Oil Company
Location: Savannah River, Mile 17 Pier 50, Georgia Ports Authority
Phone: (912) 964-8821
Savannah
Savannah Oil & Chemical
Location: Savannah River 647 W. River Street
Phone: (912) 234-5402
ILLINOIS
Hartford
Ory Bros. Marine Service of America, Inc.
Location: Upper Mississippi River, Mile 197 Foot of Hawthorne Street
Phone: (618) 254-0626 (Illinois) (314) 741-2570 (Missouri)
Radio: Ch 16, KLC 791
Wood River
Hartford Fueling Service
Location: Upper Mississippi River, Mile 196
Phone: (618) 254-4333 (314) 741-3667
Radio: Ch 16 VHF KLG 280
KENTUCKY
Louisville
Wooten River Service
Location: Ohio River, Mile 603 2927 River Road
Phone: (502) 896-0317
Paducah
Molloy Marine Service, Inc.
Location: Ohio River, Mile 934 100 Husband
Phone: (502) 443-6456
Paducah
Walker Midstream Fuel and Service Co.
Location: Ohio River, Mile 934 532 South Second St.
Phone: (502) 442-2738
Radio: freq. 156
LOUISIANA
Amelia
Berwick Bay Oil Co., Inc.
Location: Bayou Boeuf Intracoastal Waterway 1/2 mile North 85 mile board
See Berwick listing under Morgan City, La.
Baton Rouge
Capital Marine Supply, Inc.
Location: Lower Mississippi, Mile 230 Foot of North Street
Phone: (504) 343-8379
Radio: Channels 16, 7a, 10, 66a VHF KFT 322.
Baton Rouge
Channel Fueling Service, Inc.
Location: Lower Mississippi, Mile 232 River Road
Phone: (504) 383-4691, 383-4814
Radio: freq. 156.8
Belle Chasse
Plaquemines Oil Sales Corp.
See Plaquemines Oil, Venice, La.
Berwick
Berwick Bay Oil Co., Inc.
Location: Atchafalaya River - 1/4 mile north of Hwy 90 bridge
See Berwick Oil Listing under Morgan City, La.
Cameron
Berwick Bay Oil Co., Inc.
Location: Calcasieu River
See Berwick Bay Oil listing, Morgan City, La.
Cameron
Cameron Marine Service, Inc.
Location: Calcasieu River
Phone: (318) 775-5206
Dulac
Berwick Bay Oil Co., Inc.
Location: Houma Navigation Channel 17 miles South of Houma
See Berwick Bay Oil listing, Morgan City, La.
Gretna
John W. Stone Oil Distributor, Inc.
Location: Lower Mississippi, Mile 96.5 87 First Street, Gretna Harvey 77059
Phone: (504) 366-3401
Radio: KGW 352
Houma
Houma Oil Company, Inc.
Location: Intracoastal Canal
Phone: (504) 872-0464
Intracoastal City
Berwick Bay Oil Co., Inc.
Location: Vermillion River - 1/4 mile north of Intracoastal Canal Mile 155
See Berwick Bay Oil listing, Morgan City, La.
Lake Charles
Channel Fueling Service, Inc.
See Channel Fueling Service, Sulphur, La.
Morgan City
Berwick Bay Oil Company, Inc.
Location: Young's Road
Phone: (504) 384-1610
Radio: Ch 16 VHF-KXR979
New Orleans
Gulf Outlet Fuel & Marine Supplies, Inc.
Location: Gulf Intracoastal Waterways Mile 8 East 3400 Jourdan Road
Phone: (504) 241-8680
Radio: KVF 893
Port Allen
Tri-State Marine Service Co.
Location: Lower Mississippi, Mile 227.5 River Road
Phone: (504) 749-3171
Radio: 156.8
Sulphur
Channel Fueling Service, Inc.
Location: Gulf Intracoastal Waterway West, Intersection of Calcasieu River
Phone: (318) 583-7215, 583-7384
Radio: 156.8
Venice
Plaquemines Oil Sales Corp.
Location: Mississippi River Mile 10.5 at Grand Pass Louisiana Hwy 23, Venice
Address: Belle Chasse
Phone: (504) 394-5555 (Belle Chasse) (504) 534-7403 (Venice)
Radio: WYZ 2375
MASSACHUSETTS
Gloucester
Progressive Oil Co., Inc.
Location: Gloucester
Address: 92 Grove St.
Phone: (617) 283-2000
MINNESOTA
Winona
Waterways - Winona, Inc.
Location: Upper Mississippi, Mile 725 376 East 2nd St.
Address: 455 North St. Fountain City, Wi.
Phone: (608) 687-6931 (Wisconsin) (507) 452-5252 (Minnesota)
Radio: Ch 16-12
MISSISSIPPI
Biloxi
Ship Services Corporation
Location: Gulfport State Port and Biloxi Back Bay, Beacon ;7
Phone: (601) 374-1000
Greenville
Waterways Marine of Greenville, Inc.
Location: Lower Mississippi, Mile 537 Warfield Point Road
Phone: (601) 335-2526
Radio: KWS 617
Pascagoula
Fuel Services, Inc.
Location: Bayou Casotte Ingalls Avenue
Phone: (601) 762-0636, 762-0640
Radio: Ch 16
Vicksburg
Vicksburg Mid-River Services, Inc.
Location: Lower Mississippi, Mile 437 Foot of Lee Street
Phone: (601) 636-4814, 636-7731
Radio: 156.8
MISSOURI
St. Louis
St. Louis Fuel & Supply Co., Inc.
Location: Upper Mississippi, Mile 179
Address: Foot of Gratiot Street
Phone: (314) 421-3960
Radio: Ch 16, VHR-KDO 722 Fort Guage
NORTH CAROLINA
Elizabethtown
Campbell Oil Company, Inc.
Location: 1010 West Broad Street
Phone: (919) 862-4107
OREGON
all ports
see Lilyblad Petroleum listing under Tacoma, Washington
PENNSYLVANIA
Philadelphia
River Associates, Inc.
Location: Delaware River Pier 9 North
Phone: (215) 463-8100
SOUTH CAROLINA
Charleston
Charleston Oil Co.
Location: Ashley and Cooper Rivers, 1553 King St. Extension
Phone: (803) 577-5600
Charleston
See Savannah Oil & Chemical, Savannah, Ga.
Georgetown
See Savannah Oil & Chemical Savannah, Ga.
Port Royal
See Savannah Oil & Chemical Savannah, Ga.
TENNESSEE
Memphis
Memphis Boat Refueling Service, Inc.
Location: Lower Mississippi, Mile 735 Foot of Illinois Street
Phone: (901) 775-3131
Radio: Ch 16
Memphis
Waterways Marine of Memphis, Inc.
Location: Lower Mississippi, Mile 736 Foot of Beale Street
Phone: (901) 525-5761
Radio: Ch 16, 156.6
TEXAS
Corpus Christi
Belcher Co. of Texas, Inc.
Address: 504 Navigation Corpus Christi, Tx. 78403
Phone: (512) 888-6311
Galveston
Grasso Marine Service, Inc.
Location: Galveston Ship Channel Pelican Island
Phone: (713) 744-2888 (dock) (713) 763-4343 (office)
Houston
Houston Marine Services, Inc.
Location: Beacon 126 Houston Ship Channel
Phone: Dock (713) 424-4502 Office (713) 455-8819
Radio: Channel 16
Lake Jackson
Channel Fueling Service, Inc.
Location: Gulf Intracoastal Waterway West, Mile 393 1400 Marlin Avenue
Phone: (713) 233-5321, 233-5322
Radio: 156.8
Port Arthur
Channel Fueling Service, Inc.
Location: Gulf Intracoastal Waterway West, Mile 282 5700 Proctor Street
Phone: (713) 962-5557
Radio: 156.8
Rockport
Berwick Bay Oil Co., Inc.
Location: Rockport Navigation Harbor, Intracoastal Canal, Mile 526
See Berwick Bay Oil Listing, Morgan City, La.
VIRGINIA
Norfolk
Marine Oil Service, Inc.
Location: Elizabeth River
Address: 71 Radar Street
Phone: (804) 622-0934, 622-3109
WASHINGTON
Seattle
Ballard Oil Co.
Location: Lake Washington Ship Canal
Phone: (206) 783-0241
Tacoma
Lilyblad Petroleum, Inc.
Location: Washington and Oregon - all ports
Phone: (206) 572-4402
Radio: KLB radio station Marysville, Wa.
WASHINGTON
all other ports see Lilyblad Petroleum above.
WEST VIRGINIA
Pt. Pleasant
City Ice & Fuel Co.
Location: Ohio River, Mile 265.3
Address: 224 First Street
Phone: (304) 675-2010

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Name _____
Title _____
Company/Vessel _____
Address _____
City _____ State _____ Zip _____

The Wadsworth, shown here during Navy acceptance sea trials, is the first of 22 FFGs Todd will deliver by 1984 from its Los Angeles and Seattle Divisions under Navy contracts totaling $1.2 billion.

Todd Delivers Its First FFG-Class Guided Missile Frigate To The U.S. Navy

The USS Wadsworth, the first Todd-built FFG-class guided missile frigate, was delivered recently to the United States Navy by Todd Shipyards Corporation. The FFG's mission is to keep the international sealanes open for the nation's defense needs and vital maritime trade.

John T. Gilbride, chairman and chief executive officer, reported Todd's Los Angeles and Seattle Divisions will deliver a total of 22 FFGs by 1984, including five more within the next 12 months. He said the entire program has progressed on or ahead of schedule since the company started construction in 1976. Todd, which holds FFG contracts from the Navy totaling $1.2 billion, has developed a skilled workforce of more than 5,000 shipbuilders at two shipyards for the program.

The new class of versatile, 445-foot, turbine-powered ships incorporate automated machinery and remote controlled weapons systems which reduce crew size, improve tactical capabilities, and provide operating economies. The vessel is equipped with antiaircraft and homing cruise missiles, and performs antisubmarine warfare with helicopters, sonar detection and torpedo launchers.

Todd Shipyards Corporation, one of the nation's largest independent shipbuilding companies, operates on three coasts, in Seattle, Wash., San Francisco and Los Angeles, Calif., Galveston and Houston, Texas, New Orleans, La., and Brooklyn, N.Y.

Title XI Application For 15 River Barges To Cost $4.2 Million

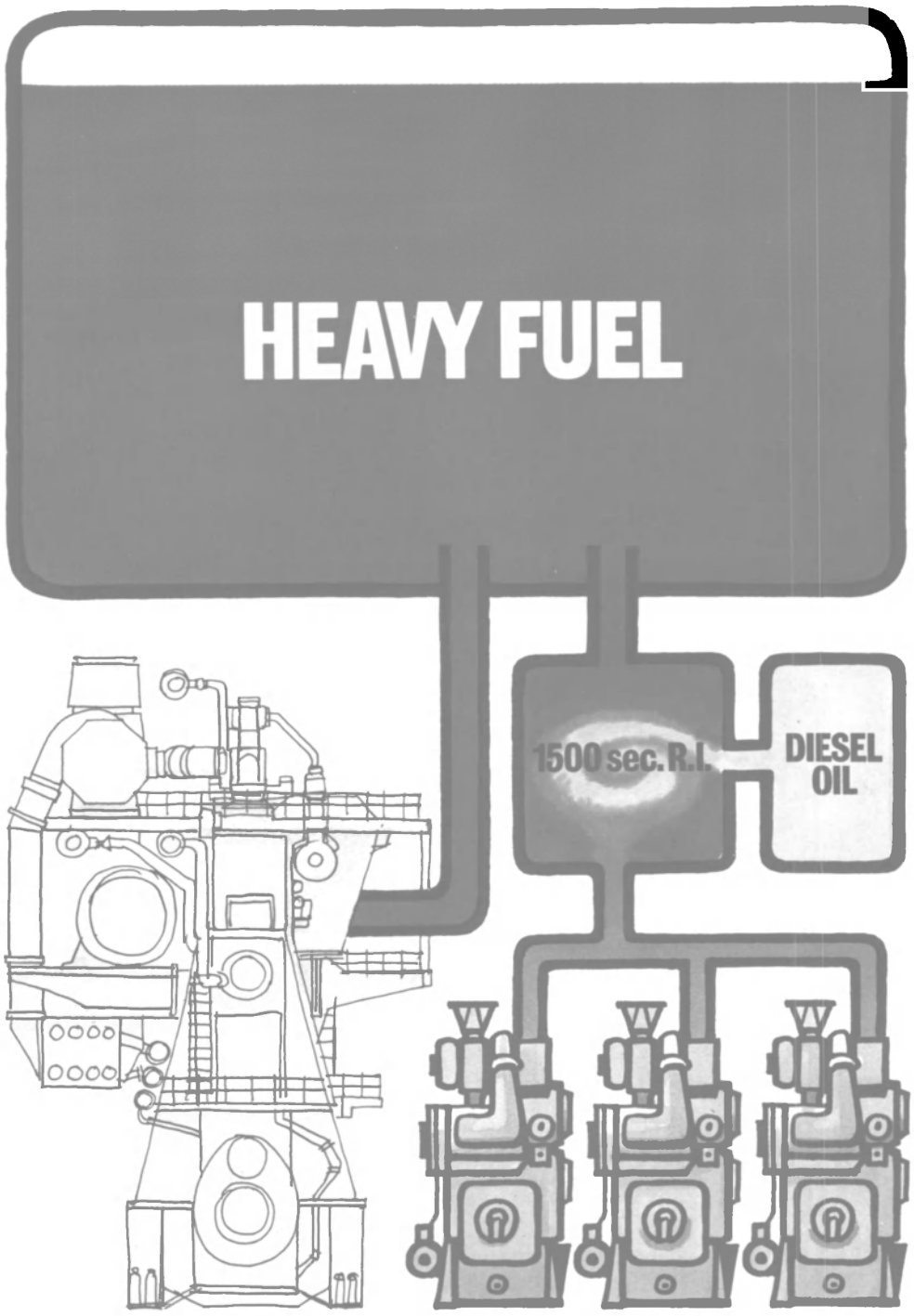
Shearson River Barge Associates-III, 767 Fifth Avenue, New York, N.Y., has applied for a Title XI guarantee to aid in financing the construction of 15 semi-integrated barges with steel lift-off covers. The river barges, 195 feet by 35 feet by 12 feet, would be used to provide general barge transportation service on the Mississippi River and its tributaries.

Dravo Corp., Pittsburgh, Pa., is the proposed builder, with deliveries to be during the period September 1 to October 15, 1980.

The estimated actual cost of the 15 barges is $4,200,000. If approved, the Title XI guarantee would be for $3,675,000, which is 87½ percent of the actual cost.

B&W

NEW B&W Holeby Diesel Auxiliaries pay for themselves in less than 2 years

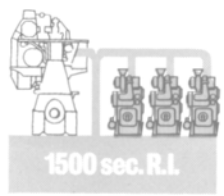


because B&W Holeby Diesel's 4 stroke medium speed auxiliary engines are operating straight on IF180 (1500 sec. R.I.)

So - are you building a new ship or re-engining - think about the price-difference of intermediate fuel compared to diesel oil.
You can actually save some US $400,000 on your fuel bill on a 2500 tonnes consumption per year.

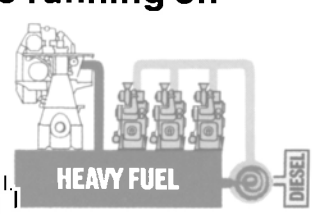
1 Main engine running on 1500 sec. R.I.

When the main engine is operating on IF 180 (1500 sec. R.I.) it's easy because the B&W Holeby Diesel auxiliaries will run on the same fuel.



2 Main engine running on heavy fuel

When the main engine is operating on heavy fuel the B&W Holeby Diesel auxiliaries will run on the same with only a minor addition of diesel oil. E.g. will 90 per cent IF 380 (3500 sec. R.I.) + 10 per cent diesel oil give you the IF 180 (1500 sec. R.I.) blend.



Please contact B&W Holeby Diesel for further information about auxiliary operation on intermediate fuel.

B&W Holeby Diesel

DIVISION OF B&W DIESEL AS

DK 4960 Holeby Denmark
Telephone 45-3-90 60 26
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Stolt-Nielsen, Inc. Supports Midshipman Programs

U.S. Merchant Marine Academy Acting Superintendent **Howard Casey** (left) accepts Stolt-Nielsen's contribution from **Robert Matthes**, manager for administration.

Stolt-Nielsen, Inc. of Greenwich, Conn., recently demonstrated its support for midshipman programs at the U.S. Merchant Marine Academy with a $1,000 donation.

Robert F. Matthes, manager for administration at Stolt-Nielsen and a 1949 Academy graduate, presented his company's contribution to **Howard F. Casey**, Acting Superintendent of the Academy at Kings Point, N.Y.

Stolt-Nielsen's donation helps underwrite programs which receive no appropriated Federal funds, such as athletics and cultural events.

Philadelphia Section Discusses Design & Construction Of 2,000-Ton Cargo Vessel

The Philadelphia Section of The Society of Naval Architects and Marine Engineers met recently at the Philadelphia Engineers' Club, Philadelphia, Pa. After a social hour and dinner, coauthors **A.C. Brown Sr.**, vice president of J.J. Henry Co., Inc., Moorestown, N.J., and **F.J. Bradley Jr.** assistant vice president-Engineering of American Atlantic Lines, New York, N.Y., presented their paper entitled "Design and Construction of 2000 Ton Cargo Vessel for A.M.I."

The paper described the M/V America which was delivered in November 1979, and is the first in a series of three ships being built by Equitable Shipyards, New Orleans, La., for American Marine Industries.

The America-class vessels are designed for service between the U.S. and the Caribbean.

The three 2,000-dwt vessels are among the most technologically advanced vessels for their size in the U.S.-flag liner fleet. Their size and design make them particularly suited for calls at shallow-draft ports with limited cargo-handling facilities. Since they are fully automated with a high degree of cargo flexibility, they are extremely adaptable to a wide variety of cargoes. Further, their ability of quick turnaround coupled with a reduced manning (10 men) enable the vessel to run at low operating costs.

Refrigerated cargo can be accommodated in both the ships' reefer spaces and in refrigerated containers. High productivity cargo gear enables the vessels to handle both 20-foot and 40-foot containers.

Shown above at the recent meeting of the Philadelphia Section SNAME are, left to right: (seated) **J.F. Christensen**, coordinator; **K. Gyswyt**, chairman, and **J. Hibbits**, vice chairman; (standing) **F.J. Bradley** and **A.C. Brown**, authors, and **T.P. Campbell**, secretary-treasurer.

Principal characteristics of the new 3,000-horsepower, 2,000-ton cargo vessels are: length overall, 295 feet; beam molded, 45 feet; draft design molded, 14 feet; and a speed of 13.75 knots.

R. Spilman of Moore-McCormack, who acted as owner's approval agent during the detail design and construction, presented a written discussion describing the model testing leading to revised bow lines and the addition of a bulb. **Ms. C. Lowe** of J.J. Henry Co., Inc. presented a written discussion covering the speed and maneuvering aspects of the trial trip. A discussion was also presented by **G. Uttmark**, general manager of Trans Tech Co., on the economic design criteria of these vessels.

J.F. Christensen, project manager, J.J. Henry Co., Inc., acted as coordinator for the meeting.

PREVIEW–12th Annual Conference And Exhibition—

OTC-80

There is one event each year that the entire offshore industry recognizes as the focal point for the dissemination and display of the latest technology, equipment, and services—The Offshore Technology Conference (OTC). The Conference will be held on May 5-8, 1980 in the Astrodomain, Houston, Texas.

Each year, some 80,000 scientists, managers, and engineers from 90 nations attend this technical conference and exhibition. As the search for more ocean resources intensifies, the significance of OTC intensifies as a common meeting ground for the many disciplines that harbor facets of ocean resource development and environmental protection.

The Conference will feature an exchange of theories and practical applications as authors from 25 countries participate in a technical program of more than 280 papers. This technology exchange is drawn from 400,000 professionals belonging to one or more of the 11 sponsoring societies. The comprehensive program will address such topics as subsea production operations, deepwater drilling, offshore safety, subsea mining, ocean thermal energy conversion, and dynamic positioning.

Conference registrants also will be able to observe the vast exhibit display that will span the breadth of the offshore industry and covers more than 450,000 square feet. More than 2,000 companies from 22 countries will demonstrate equipment and services in such areas as oil-well drilling, completion and production, navigation, diving, pollution control, and power generation. With virtually every aspect of offshore technology featured, participants have the opportunity to view first hand the latest technical achievements of ocean resources development.

One of the evident impacts of OTC is the thousands of smaller successes which evolve as a result of personal contact, sharing of information, and the exchange of ideas and theories among the participants.

OTC is for the benefit of professionals in the offshore industries. The general public is not encouraged to attend.

Awards Luncheon

The OTC Executive Committee will present the prestigious 1980 OTC Achievement Awards for Individuals and Organizations during the Awards Luncheon, Tuesday, May 6. This year's award recipients, **R. Curtis Crooke** and Exxon Company, U.S.A., were chosen in recognition of outstand-

ing accomplishments in the development of offshore technology.

Mr. **Crooke**, president of Global Marine Development Inc., will be honored for his development of surface vessel exploration and production technology over the past 25 years.

Exxon Company, U.S.A. receives the award for its contribution to subsea technology in the design and pilot test of a deepwater diverless Submerged Production System (SPS). The remote-controlled SPS represents new flexibility in developing offshore oil and natural gas reserves by providing an alternative to conventional platforms and satellite wells. Exxon's SPS provides methods for safe, economical, and efficient production in depths beyond platform capabilities as well as in remote and hazardous areas. Exxon has stated that the SPS project represents more than 300 man-years of research and development.

Message Center

A Message Center will be operated by Southwestern Bell in the lobby of Astrohall during the Conference. The Message Center will be open from 7:30 a.m. to 6:00 p.m. on Monday, 8:00 a.m. to 6:00 p.m. Tuesday and Wednesday, and 8:00 a.m. to 3:00 p.m. on Thursday. All messages for persons attending the Conference should be telephoned to (713) 747-2152. No paging system is available in the Astrodomain complex.

OTC-TV Expanded

The Offshore Technology Conference Television Network will expand the impact of OTC again this year through a special nine-hour public broadcast to be aired over KUTH-TV, Channel 8, Houston's Public Broadcasting Service affiliate. The program to be aired over five days, May 4-8, will seek to translate the status of ocean resource development to the general public.

Now in its third year of public broadcast, OTC-TV will concentrate on the issues of today that reflect the growth and the challenges of the offshore industry. The noncommercial, public-interest program will parallel the Conference itself, interpreting into layman's terms the significant and fascinating achievements of industry and academia.

The public broadcast of OTC-TV will be one hour on Sunday evening, May 4 (time unspecified), and from 6:30 to 8:30 a.m. each day of the Conference.

During Conference hours, OTC-TV will broadcast closed-circuit in the Astrodomain complex information on technical sessions and other items of interest to Conference registrants.

Transportation

Complimentary express bus service will operate regular intervals between the Astrodomain complex and all hotels and motels listed with the OTC Housing Bureau and the official OTC travel agents during the Conference, May 5-8. Bus schedules will be available in the registration areas at the participating hotels and motels.

Accommodations

Excellent housing accommodations are available for OTC registrants in the city of Houston and nearby Galveston, a popular beach resort. All rooms have telephones, televisions, private baths with tub and/or shower. Most have two double beds.

Room requests are filled by the OTC Housing Bureau, 1522 Main Street, Houston, Texas 77002.

Registration

Registration fees for the 1980 OTC are based on two registration alternatives: (1) Four-day registration allowing access to both conference and exhibition for the duration of '80 OTC, and (2) Daily registration allowing access to the conference and exhibition for a single, specified day. Registration for college or university students with valid registration cards from their respective schools is complimentary. Spouses and students (other then college students) may register at four-day or daily member rates.

There are three basic options for the individual registering for OTC, namely: advance registration by mail, advance registration on site prior to OTC, and registration during OTC. Advance registration will be handled by OTC, 6200 North Central Expressway, Dallas, Texas 75206.

NASA Tours

The Lyndon B. Johnson Space Center, a $202-million complex, is one of the newest and largest research and development facilities of the National Aeronautics and Space Administration. Serving as the focal point for the U.S. manned space flight program, the Center develops technology required for the design and operation of manned spacecraft, selects astronauts, and controls NASA space flights from launch to landing.

Visitors to the LBJ Space Center may view films and participate in a walking tour of the facilities. Tours are scheduled for Tuesday, May 6, and Wednesday, May 7, departing from the Astrohall. Reservations may be made at the NASA tour desk in the International Center in the Astrohall.

OTC Publications

If you are unable to attend the 1980 Conference and would like to order copies of either the 1980 Proceedings (four-volume set), Proceedings Index, and/or Registration List, contact OTC at 6200 North Central Expressway, Dallas, Texas 75206 for an order form.

Sets of Proceedings from previous Conferences and past editions of the Indexes—listing subjects and authors for papers presented at the 1969-1979 Conferences — can be obtained at the same address.

Food Service

The Astrodomain provides the OTC registrant with many choices of food at one of the many snack stands, or at a sit-down meal in one of four restaurants. Houston restaurant guides will be available at all registration areas in each of the three buildings.

(A floor plan of the Astrodomain appears on page 15. Exhibitors and their booth numbers appear on page 16 and following)

TIMETABLE
TECHNICAL SESSION

All technical sessions will be held in the Astrohall

Monday Morning—9:30 a.m. to 12 noon
- Submersibles I
- Seafloor Surveying and Mapping
- Ocean Energy
- Design and Construction Criteria for Offshore Structures
- Fatigue Analysis of Welded Tubular Connections
- Field Development
- Oceanography

Monday Afternoon—2:30 p.m. to 5:00 p.m.
- Special Session: Blowout Control Management

Tuesday Morning—9:30 a.m. to 12 noon
- Submersibles II
- Physical Properties of Marine Sediments
- Drilling and Subsea Production
- Pipelines I
- Material Performance in Offshore Pipelines and Platforms
- Capacity of Pile and Mat Foundations
- Acoustics and Control Systems
- Wind and Wave Forces

Tuesday Afternoon—2:30 p.m. to 5:00 p.m.
- Submersibles III
- Geotechnical Properties of Marine Sediments
- Marine Risers
- Pipelines II
- Structural Connections
- Environment and Pollution Considerations
- Offshore Platform Crane Dynamics
- Response of Structures to Wave Forces

Wednesday Morning—9:30 a.m. to 12 noon
- SPM Ocean Terminals
- Geophysical Research/3D Seismic Exploration
- Mooring and Anchoring
- Seismicity and Platform Response to Earthquakes
- Piles and Piledriving
- Deep Ocean Mining
- Platform Loadout and Transport

Wednesday Afternoon—2:30 p.m. to 5:00 p.m.
- Oil Loading and LNG Transfer Offshore
- Geophysical Operations
- Ropes and Chains for Offshore
- Cathodic Protection and Control of Marine Growth
- Measurement of Platform Dynamic Response
- Pile Capacity and Load Tests
- Marine Mining and Dredging
- Offshore Platform Concepts

Thursday Morning—9:30 a.m. to 12 noon
- Ice/Arctic Activities
- Corrosion Control in Offshore Operations
- Vessel Motion and Station Keeping
- Structural Analysis and Design
- Safety and Fire Prevention in Offshore Processing
- Marine Geology and Geophysics

1980 OTC Program Committee

The Program Committee for the Twelfth Annual Technology Conference consisted of a representative from each of the 11 sponsoring technical societies. These representatives are listed below together with the technical society they represent and their business affiliation.

Jere A. Noerager, Program chairman, Exxon Production Research Co.
Arthur O. Beall Jr., (AAPG), Conoco Inc.
Gale L. Hubred, (AIChE), Chevron Research Co.
Daniel G. Godfrey, (ASCE), Shell Development Co.
William P. Dixon, (ASME), Esso Exploration, Inc.
Glen N. Williams, (IEEE), Texas A&M U.
James H. Osborn, (MTS), Naval Facilities Engineering Command
A.M. Olander, (SEG), Exxon Co., U.S.A.
John W. Padan, (SME), NOAA, Office of Marine Minerals
James M. Magill, (SNAME), Atwood Oceanics, Inc.
Paul J. Durning, (SPE), Union Oil Co. of California
John A. Straatmann, (TMS), Climax Molybdenum Co.

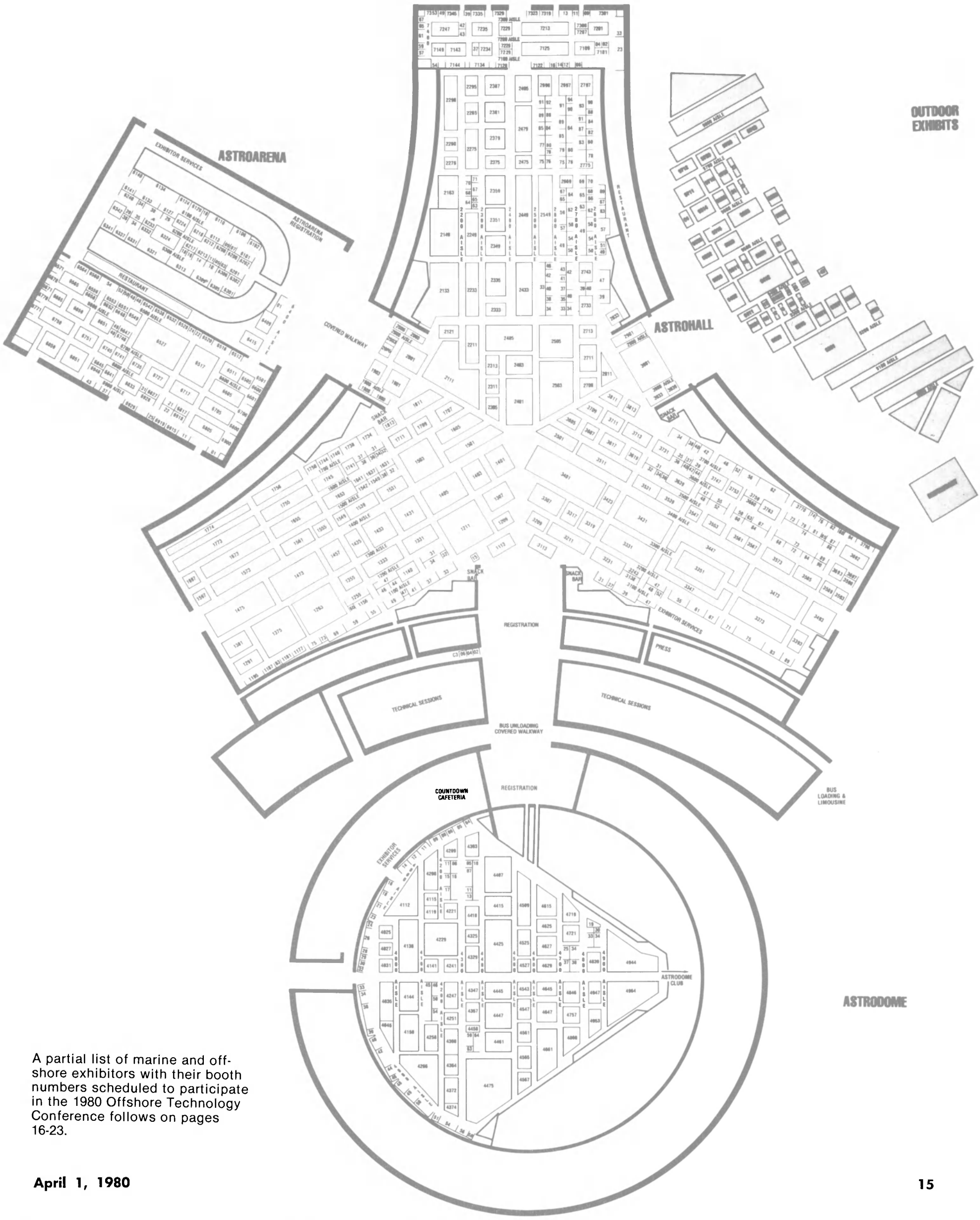
CONFERENCE SCHEDULE

Monday, May 5
Registration
7:30 a.m. — 6:00 p.m.
Exhibition
8:30 a.m. — 6:00 p.m.
Technical Programming
9:30 a.m. — 12 noon
2:30 p.m. — 5:00 p.m.

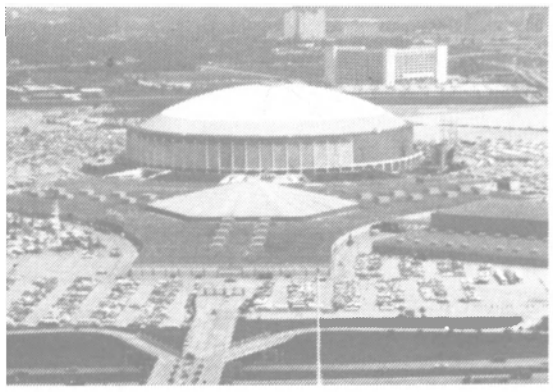
Tuesday, May 6
Registration
8:00 a.m. — 6:00 p.m.
Exhibition
8:30 a.m. — 6:00 p.m.
Technical Programming
9:30 a.m. — 12 noon
2:30 p.m. — 5:00 p.m.
Awards Luncheon
12:15 p.m. — 2:00 p.m.

Wednesday, May 7
Registration
8:00 a.m. — 6:00 p.m.
Exhibition
8:30 a.m. — 6:00 p.m.
Technical Programming
9:30 a.m. — 12 noon
2:30 p.m. — 5:00 p.m.

Thursday, May 8
Registration
8:00 a.m. — 3:00 p.m.
Exhibition
8:30 a.m. — 3:00 p.m.
Technical Programming
9:30 a.m. — 12 noon



A partial list of marine and offshore exhibitors with their booth numbers scheduled to participate in the 1980 Offshore Technology Conference follows on pages 16-23.



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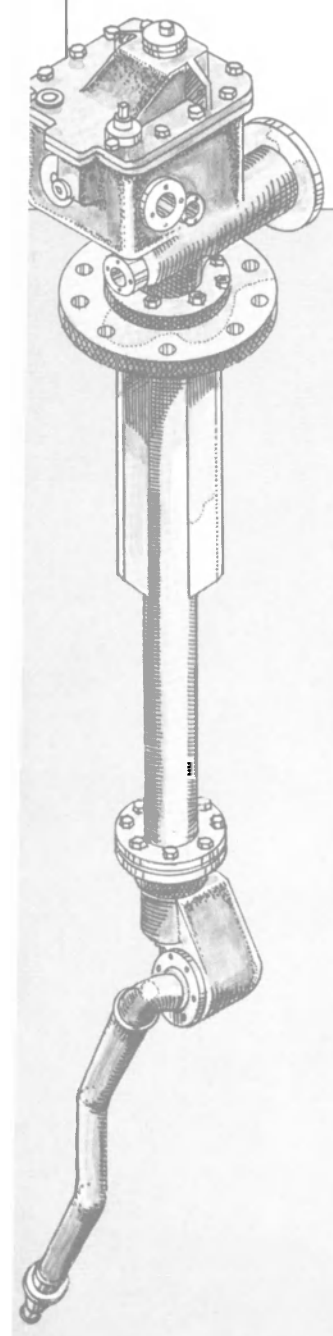
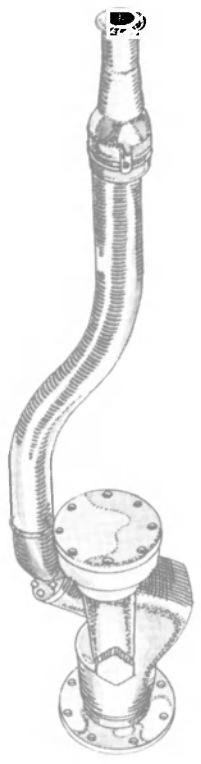
(continued from page 15)

3.

The BUTTERWORTH® MP Machine. Cleans Hard-to-reach Areas From Any Angle.

The multi-position, very high-capacity BUTTERWORTH® MP machine is designed to clean hard-to-reach areas in complex tank structures. Self-powered

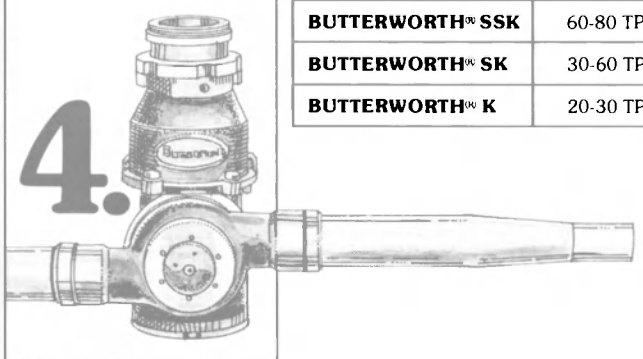




and featuring simple design, the MP provides the very high reliability required for within-tank mounting. This single nozzle tank cleaning machine weighs 178 lbs and can be fixed-in-place in any location, at any angle, and is specifically designed to allow installation on tank bottoms under the cargo.

The MP advantage: cleans large areas which cannot be reached by conventional deck-mounted equipment and provides unbeatable Butterworth Systems performance.

4.



The BUTTERWORTH® SSK Machine. For Small Areas or Medium Size Tanks.

The BUTTERWORTH® SSK two-nozzle machine combines throughput and range to clean medium sized tanks or hidden areas in large tanks. The SSK machine can be fixed-in-place at any angle, weighs 55 lbs and has a throughput capacity of 80 tons per hour and an effective cleaning range of approximately 100 feet.

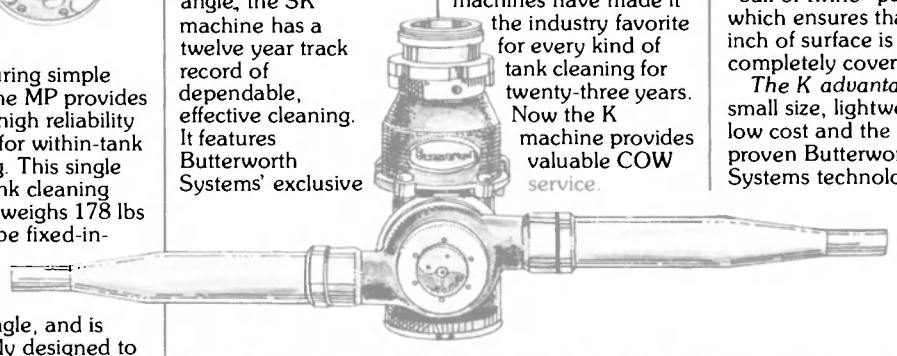
The SSK advantage: low cost cleaning of moderate size tanks with famous Butterworth Systems technology.

5.

The BUTTERWORTH® SK Machine. Cleans Hidden Areas or Smaller Tanks.

Fixed-in-place at any angle, the SK machine has a twelve year track record of dependable, effective cleaning. It features Butterworth Systems' exclusive "ball of twine" spray pattern that crisscrosses and overlaps for thorough cleaning. The SK machine weighs 55 pounds and has a throughput of 30-60 tons per hour and a range of 70 feet.

The Super K advantage: low cost cleaning of hard-to-reach areas plus Butterworth Systems reliability.

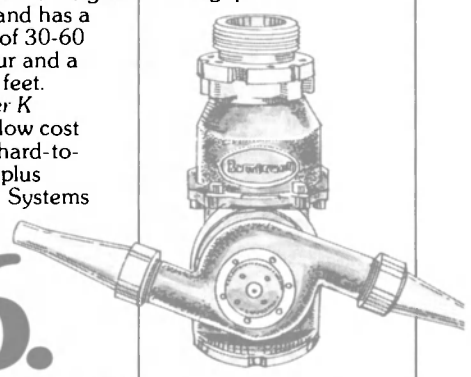


6.

The BUTTERWORTH® K Machine For Small Tanks, Fixed-in-place at Any Location.

Over 20,000 BUTTERWORTH® K machines have made it the industry favorite for every kind of tank cleaning for twenty-three years. Now the K machine provides valuable COW service.

It weighs less than fifty pounds, has a cleaning range of 30 feet and up to 30 tons per hour throughput.



Fixed-in-place, the K machine is ideal for cleaning smaller tanks or small hard-to-clean areas in large tanks. Its twin nozzles rotate while the entire unit revolves, thereby producing Butterworth Systems' "ball of twine" pattern which ensures that every inch of surface is completely covered.

The K advantage: small size, lightweight, low cost and the most proven Butterworth Systems technology.

For any capacity range or tank location Butterworth Systems has proven equipment to meet your needs.

Unit	Capacity Tons Per Hour	Weight	Location	Attitude
LAVOMATIC® SA	90-150 TPH	820 lbs	Deck Mounted	Vertical
BUTTERWORTH® P-60	90-150 TPH	690 lbs.	Deck Mounted	Vertical
BUTTERWORTH® MP	70-150 TPH	178 lbs.	Any	Any
BUTTERWORTH® SSK	60-80 TPH	55 lbs.	Any	Any
BUTTERWORTH® SK	30-60 TPH	55 lbs	Any	Any
BUTTERWORTH® K	20-30 TPH	48 lbs	Any	Any

BUTTERWORTH 1930-1980

Butterworth Systems

For more information contact **Butterworth Systems Inc.**
224 Park Avenue, Box 352, Florham Park, N.J. 07932 USA
Telephone: (201) 765-1549 Telex: 136434

Butterworth Systems (UK) Ltd.
445 Brighton Road, South Croydon, Surrey CR2 6EU, England
Telephone: 01-668-6211 Telex: 946524

(continued on page 19)

Simrad. A trusted name at sea.

The Navigation Computer that started it all... from Simrad, naturally.

Simrad's CC-2 Navigation Computer gives complete position, steering and piloting information in an easy-to-use system. It is still the only separately packaged Loran C navigation computer, and can accept input data from any Simrad Loran C receiver.

The CC-2 can repeat Loran C time difference numbers, convert Loran C position to latitude longitude, and will store up to nine "waypoints" or destinations. It continuously computes distance, time to destination and bearing from your present position to any of the nine selected destinations or waypoints. It also computes speed over the ground, course made good and off-course "cross track error" for steering adjustments. Lat Long position is read out to tenths of seconds (0.6 nautical mile) and off-track deviations can be read out in hundredths of a nautical mile. The computer is so flexible, you can even use it to solve separate time course distance problems while it continues to update actual navigation data internally.

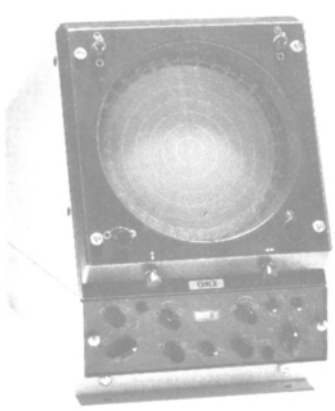
New digital recording sounders meet IMCO requirements.

Simrad now offers two economical navigation recording echosounders that meet IMCO recommendations for merchant vessels. In addition to showing a well-defined bottom on recording paper, the systems have independent digital depth indicators and depth alarms. The Simrad ED-161 has four recording ranges from 0-25 to 550 fathoms. The ED-162 has 0-30, 0-75, and 0-150 foot recording ranges for navigating in shallower waters, plus a 0-1500 foot deep range. The optional IR 201 Remote Digital Analog Indicator displays depth in feet, meters and fathoms.

These systems are also designed as replacements for existing older systems. Due to Simrad's special engineering, some vessels can be retrofitted from *inside* the hull without having to dry dock.

Ship's radar from Simrad.

Ten and twenty KW radar models from Simrad are building a reputation for extra fine resolution that you can count on. It is natural to think about long range use, and they do have six ranges from ¼n.m. to 48 n.m., with an additional 30 to 78 n.m. setting on the 20 KW model. However, they really outperform competition at extremely close distances. At the ¼ n.m. range, they provide the unusual resolution you need to pick out small boats and channel markers in a dense fog. And that's the most critical test for any radar. Choice of four or six foot antenna. Variable range marker (VRM) with digital readout, and early warning target alarm options are available. For smaller vessels, Simrad's ONX-6 (5KW) with choice of 3 or 4 foot slotted array antenna, and all electronic scope sweep, is recommended.



Loran C means Simrad.

Throughout the world, skippers have learned to trust Simrad's Loran C reliability and accuracy...and to rely on Simrad's sales, installation and service network in more than 450 ports throughout the world.

Our "New Generation" LC-123 now has many more advanced features, including signal integration that sets a new standard in readout accuracy. With its "touch pad" keyboard, our new LC-112 provides high performance at an economical price. Both models have been designed and manufactured to meet or exceed all Minimum Performance Standards (MPS) of the Radio Technical Commission for Marine Services (RTCM), adopted 12/20/77, including Addendum #1 dated 7/19/79, as endorsed by the U.S. Coast Guard for use aboard vessels over 1600 gross tons when calling at ports in the Continental U.S. This is a legal requirement for ship operation in U.S. waters.

Simrad's Loran was recently tested against eleven other receivers by an independent testing laboratory under contract to the Canadian Department of Fisheries and Oceans. Since the LC-112 had not been introduced yet, it couldn't be included in the test. However, in long range tracking tests, three units were judged superior... Simrad's LC-123, Simrad's older LC-204 and another manufacturer's receiver that costs over $2,000 more than an LC-123. Several competitors complimented Simrad by copying our LC-123, but evidently they still couldn't match Simrad's performance and reliability. Our ten years of experience in developing Loran C technology is important to you. A cheap loran could be costly.

SIMRAD

Simrad Inc., One Labriola Court,
Armonk, NY 10504 (914) 273-9410

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(continued from page 17)

Exhibitor	Booth
GH-PROGRESSIVE METALS	2359,9625
GH-STABIL DRILL	2359,9625
GHS-GROSSROHRKONTOR HOESCH SALZGITTER GMBH	4415
GIESSELBACH ELECTRO ENGINEERING	1475
GLOBAL MARINE INC	3531
GOODALL RUBBER COMPANY	4246
THE GORMAN-RUPP COMPANY	3770
GOTAVERKEN ARENDAL	1375
GOTCO INTERNATIONAL, INC	2000
GRANDMET INTERNATIONAL SITE SERVICES LTD	3347,3351
GRANT OIL TOOL COMPANY	4357
GRAY TOOL COMPANY, A DIVISION OF COMBUSTION ENGINEERING, INC.	4944
GREER HYDRAULICS	2642,9628
GRIPHOIST, INC	6831
GRUNDY ENVIRONMENTAL SYSTEMS INC.	2880
GUELPH ENGINEERING CO. LTD	1211,1291
GULF ELECTROQUIP INC	9605
GULF RADIOTELEPHONE & ELECTRONICS, INC.	3655
GULFCO DIVISION OF CHROMALLOY	4138
GULFCO INDUSTRIES, INC	6727
GULFPORT SHIPBUILDING CO	1709
HAGGLUNDS	2275
HALLIBURTON COMPANIES	3401
HALTER MARINE, INC	6401
HAMBLIN & GLOVER LTD	6549
HARCO CORPORATION	2688
HARRIS CORPORATION R.F. COMMUNICATIONS DIVISION	3689
HARRISBURG, INC.	4475
HARVEY OFFSHORE SERVICES	6605
HAWAIIAN DREDGING & CONSTRUCTION	7154
HAWKINS & TIPSON ROPEMAKERS LTD.	3347,3351
HBL INDUSTRIES	1137
H.C.G. B.V. OFFSHORE DIVISION	1473
HEEREMA ENGINEERING SERVICE	1473
HELLE ENGINEERING INC	3647
HEMPEL'S MARINE PAINTS, INC	4347
HENDRIK VEDER B.V.	1473
HERMES ELECTRONICS LTD	1211,1291
HEWLETT-PACKARD	4145
HILLGRAHAM CONTROLS LIMITED	4661
HILL HAYES COMPANIES	4661
HILLER INTERNATIONAL CORP	4254
HILMAN EQUIPMENT CO., INC	2591
HITACHI ZOSEN	1573,1673
HOESCH ESTEL	4415
HOLLAND REPAIR & SERVICE	1473
HOLLANDIA-KLOOS	1473
HOMCO INTERNATIONAL, INC	3756
HONEYWELL	2333
HOUSTON ENGINEERS, INC	9831
HOUSTON SYSTEMS MANUFACTURING CO	2669
HOWALDTSWERKE-DEUTSCHE WERFT AG	1655
HOWE-BAKER ENGINEERS, INC	4050
HUGHES TOOL COMPANY BJ-HUGHES MACHINERY DIVISION	4407
HUGHES TOOL COMPANY	2305
HUMPHREY, INC	1542
HUMPHREYS & GLASGOW LIMITED	3347,3351
THE HUNT COMPANY	9320
HUTCHISON-HAYES INTERNATIONAL	4447
HYDRANAUTICS	1741
HYDRIL	3901
HYDRIL	9502
HYDRO MANUFACTURING & SALES	6554
HYDRO PRODUCTS, INC	3561
HYDRO-TRON INDUSTRIAL MARKETING CORPORATION	7349
HYDRODYNAMICS CORPORATION	6845
HYDRONAUTICS, INCORPORATED	2635
HYDROTECH INTERNATIONAL, INC	1333
HYUNDAI HEAVY INDUSTRIES CO LTD/HYUNDAI CORPORATION	6735
I.F.P.	2133,2233
ICI OFFSHORE	3347,3351
ICO INC	4833
I.H.C. VERSCHURE/ORANJEWERF	1475
IMCO SERVICES	3401
IMCO SERVICES, A DIVISION OF HALLIBURTON COMPANY	3811
IMLAC CORPORATION	1908
IMODCO, A UNIT OF AMCA INTERNATIONAL CORPORATION	4268
IMPALLOY LTD	3347,3351
IMS INGENIEURGEMEINSCHAFT MEERESTECHNIK & SEEBAU GMBH	1756
INGERSOLL RAND COMPANY	2375,9615
INSTITUTO MEXICANO DEL PITROLEO	6717
INSTRUMENTATION SERVICES DIV DANIEL INDUSTRIES, INC.	2479
INTERCONTINENTAL ROPES, INC	4030
INTERNATIONAL GRATING, INC	9624
INTERNATIONAL HI-PRES AIR CONDITIONING A/S	1381
INTERNATIONAL PAINT COMPANY, INC	2676
INTERNATIONAL PETROLEUM ENGINEERING CORPORATION (IPEC)	2679
INTERNATIONAL PETROLEUM SERVICES, INC.	9842
INTERNATIONAL SALES COMPANY	6542
INTERNATIONAL SUBMARINE ENGINEERING LTD.	1211,1291
INTERNATIONAL TOOL & SUPPLY CO	9523
INTERNATIONAL TOOL COMPANY, INC	2678
INTEROCEAN SYSTEMS, INC	1555
INTERSTATE ELECTRONICS CORPORATION	2869
INTERSUB	2133,2233
ISHIKAWAJIMA DO BRASIL ESTALEIROS S.A. ISHIBRAS	7128
ISHIKAWAJIMA-HARIMA HEAVY INDUSTRIES CO., LTD.	1573,1673
ITALA STEEL	7213
ITALCANTIERI	7213
ITT HEADQUARTERS	3673,3674
IUC INTERNATIONAL INC	2285
IVY ELECTRONICS	6651
JACKSON MARINE CORP	3401
JAMES SCOTT ENGINEERING GROUP LIMITED	3431
JAPAN OCEAN INDUSTRIES ASSOCIATION	1573,1673
JMR INSTRUMENTS, INC	7323
JOHN WOOD GROUP (ABERDEEN) LTD	3347,3351
JOHNSON OIL & GAS WELL SCREENS	2878
JOHNSON RUBBER COMPANY	2758
JOHNSTON DIV. SCHLUMBERGER	1405
JORDAN VALVE	7242
JOTUN MARINE COATINGS	2433,2449
KAWASAKI HEAVY INDUSTRIES, LTD	1573,1673
KAWASAKI HEAVY INDUSTRIES, LTD	9632
KAWASAKI STEEL CORPORATION	1573,1673
KAWECKI BERYLCO INDUSTRIES INC	6800
KELCO OIL FIELD PRODUCSTS	1169
KEMLON PRODUCTS AFFILIATE KEYSTONE ENGINEERING	6102
KEN COOK CO	7342
KENDAVIS INDUSTRIES	4475
KEPPEL SHIPYARD LTD	2854
J.C. KINLEY CO	3532
KINTEC INC	6228
KOBE, INC	1113
KOBELT J. MANUFACTURING CO. LTD	3584
KOCKUMS	1375
KOOMEY, INC	6517
KRUPP ATLAS ELEKTRONIK	4250
KTM INDUSTRIES, INC	1195
KUSTER COMPANY	2750
KVAERNER GROUP	2433,2449
KYB CORPORATION OF AMERICA	6337
LAMARCHE MFG. COMPANY	2657
LANGDON CORP	7457,9435
LANTANA BOATYARD, INC	2685
LANZAGORTA INTERNATIONAL, INC	4360
LAVACO	9320
TRW LAWRENCE CABLE	2335
LEBUS INTERNATIONAL, INC	3742
FRIEDRICH LEUTERT GMBH & CO	1773
LEVINGSTON SHIPBUILDING COMPANY	1709
LINCOLN ST. LOUIS DIVISION OF MCNEIL CORPORATION	6341
LINNENBANK INTERNATIONAL, INC	3589
LIPS ITALIANA	7213
LISTER DIESELS INC	6302
LITTON SYSTEMS INC	4464
LJUSNE CHAIN COMPANY	3261
LOCKHEED CORPORATION	1711
LOCKHEED PETROLEUM SERVICES LTD.	1211,1291
LOCKHEED PETROLEUM SERVICES LTD	1247
LORD KINEMATICS/BRIDGESTONE	3762
LUCKER DIVISION	4316
LUFKIN INDUSTRIES, INC	4366
LYNN INTERNATIONAL, INC	1597
M & J VALVE DIV DANIEL INDUSTRIES, INC.	2479
MAGNAVOX GOVERNMENT & INDUSTRIAL ELECTRONICS CO.	1738
MALTA DRYDOCKS	2854
MAMMOET TRANSPORT B.V.	1475
M.A.N. MASCHINENFABRIK	1773
MANITOWOC ENGINEERING CO	3423
MANNESMANN-ANLAGENBAU AG	1773
MANNESMANN-HANDEL AG	1773
MARATHON LETOURNEAU OFFSHORE COMPANY	2403
MARCO DRILLING	1231
THE MARCONI INTERNATIONAL MARINE CO. LTD	3347,3351
MARINAV CORPORATION	1211,1291

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Exhibitor	Booth
MARINE AND INDUSTRIAL ELECTRIC CO.	3138
MARINE CONCRETE STRUCTURES, INC.	2762
MARINE ENGINEERING, INC. (MAMPAEY)	2749
MARINE MOISTURE CONTROL CO., INC.	2890
MARINE SAFE ELECTRONICS	7461
MARINE SERVICES DIV.	4964,9711
MARINE TECHNOLOGY SOCIETY	C302
MARINE/ENERGY DIVISION	4316
MARKLOAD SYSTEMS, INC.	2866
MARSH INSTRUMENT COMPANY A UNIT OF GENERAL SIGNAL	3659
MARTECH INTERNATIONAL, INC.	9536
MARTIN-BLACK OFFSHORE, INC.	4032
MARTIN-DECKER COMPANY	1605
MARYSTOWN SHIPYARDS LIMITED	6605
MASSEY GRINDING SERVICE, INC.	3588
MATHERS CONTROLS INC.	1147
MATHEY MANUFACTURING COMPANY	3271
GH MATTCO	2359,9625
MATTHEW HALL ENGINEERING	3347,3351
MCAUTO/MCDONNELL DOUGLAS AUTOMATION CO	3746
J. RAY MCDERMOTT & CO., INC.	1811
MCEVOY OILFIELD EQUIPMENT CO	2901
MCMILLEN EQUIPMENT COMPANY	9443
MECHANICAL EQUIPMENT CO., INC (MEMCO)	2295
MELCO INTERNATIONAL	6821
J. H. MENGE & COMPANY, INC.	3734
MESOTECH SYSTEMS, LTD	1211,1291
METEX CORPORATION THERMAL & MECHANICAL GROUP	6750
METROL CORPORATION LIQUITECH DIVISION	4038
MICHIGAN WHEEL—DIV. OF DANA CORP.	1141
MICOPERI	7213
MID-CONTINENT SUPPLY CO	4475
MIDCO CONTROL SYSTEMS, INC.	4475
MIDLAND MARINE CORPORATION	2854
MIDLAND ROSS CORPORATION (ELECTRICAL PRODUCTS DIV.)	6564
MILCHEM INCORPORATED	3113
TRW MISSION MANUFACTURING CO	2335
MITSUBISHI HEAVY INDUSTRIES, LTD	1573,1673
MITSUI ENGINEERING & SHIPBUILDING CO., LTD.	1573,1673
MITSUI OCEAN DEVELOPMENT & ENGINEERING CO., LTD.	1573,1673
MOM (OFFSHORE) LTD	3347,3351
MONARCH DIVISION TRICO INDUSTRIES, INC.	4044
MONARK BOAT COMPANY	4625
LEE C. MOORE CORPORATION	2643
MORGAN BERKELEY CO. LTD	1231
MORRISON-KNUDSEN CO. INC	4042
MOTOROLA, INC.	1901
MTU OF NORTH AMERICA, INC.	6224
MUSTANG POWER PRODUCTS, INC.	9642
NANCE INDUSTRIES, INC.	3560
NAPKO CORPORATION	4027
NATIONAL MARINE SERVICE INCORPORATED, PRODUCTS DIVISION	3598
NATIONAL SUPPLY COMPANY DIV. OF ARMCO INC.	1503
THE NAVAL OCEAN SYSTEMS CENTER	7023
THE NAVAL OCEANOGRAPHIC OFFICE	7023
NAVITRONIC A/S	1381
NDT SYSTEMS, INC.	6542
NEDDRILL (NEDERLAND) B.V.	1473
NEDERLANDSCH BEVRACHTINGSKANTOOR B.V. (N.B.K.)	1475
NEDLLOYD GROUP	1473
NEIL BROWN INSTRUMENT SYSTEMS	2371
TRW NELSON DIVISION	2335
NELSON ELECTRIC A UNIT OF GENERAL SIGNAL	2888
NEOWELD CORPORATION	6759
NETHERLANDS SHIP MODEL BASIN	1475
NEW MAR OIL SERVICES LTD.	3347,3351
NEWFOUNDLAND OFFSHORE SERVICES LIMITED	6605
NEWPARK RESOURCES, INC.	4629
NEWPORT NEWS SHIPBUILDING	7147
NIFE INCORPORATED	6217
NIPPON KOKAN K.K.	1473,1673
NL PETROLEUM SERVICES	2111,3501
NOHAB DIESEL	1375
A/S NORCHEM	1231
NORDAN OFFSHORE A/S	1381
NORDCO LIMITED	6605
NORDCO LTD	1211,1291
NORDDEUTSCHE SEEKABELWERKE AG	1774
NORDDEUTSCHE SEEKABELWERKE	1573,1673
NORSEA	2433,2449
NORSK MARCONI AS	2433,2449
NORTH AMERICAN TURBINE CORP.	2298
K/S NORTH SEA EXPLORATION SERVICE	1231
NORTHERN RIG LITES LTD.	6527
NORWALK-TURBO, INC.	6234
THE EXPORT COUNCIL OF NORWAY	2433,2449
NORWEGIAN CONTRACTORS	2433,2449
NOVA SCOTIA RESEARCH FOUNDATION	1211,1291
NRP/HOSE PRODUCTS	2575
NYLANDS VERKSTED	2433,2449
D. G. O'BRIEN, INC.	4410
OCEAN DRILLING & EXPLORATION COMPANY	1355
OCEAN INCHCAPE LIMITED	6605
OCEAN RESEARCH EQUIPMENT, INC.	1631
OCEANO INSTRUMENTS	2133,2133
OCEANOGRAPHY INTERNATIONAL CORPORATION	2794
OCEANROUTES, INC. (A SWIRE GROUP COMPANY)	6213
ODENSE LINDO OFFSHORE DIVISION	1381
ODOM OFFSHORE SURVEYS, INC.	4410
THE OFFICE OF NAVAL RESEARCH	7023
OFFSHORE LOGISTICS, INC.	9238
OFFSHORE NAVIGATION, INC.	2839
OFFSHORE SAFETY/SURVIVAL DIV.	2749
OFFSHORE SUPPLY ASSOCIATION LIMITED	3553
OFFSHORE TECHNOLOGY CORP.	2870
OHIO RUBBER COMPANY	1160
OIL BASE, INC.	3739
THE OIL PATCH HUSTLER CORP.	9730
OMNIPURE	3589
ORBIT VALVE INTERNATIONAL INCORPORATED	1903
OTIS ENGINEERING CORP.	3401
THE OTTER GROUP	2433,2449
OY WARTSILA AB SHIPBUILDING DIVISION	7137
P & W OFFSHORE SERVICES LIMITED	3431
PARKER HANNIFIN CORPORATION SEAL GROUP	4006
PARKER INDUSTRY CORP.	4018
PAULUHN ELECTRIC MFG. CO., INC.	2633
PECK-O-MATIC, INC.	3740
PEERLESS MFG. CO.	4014
PENROD DRILLING COMPANY	2709
PERFORACIONES MARITIMAS MEXICNAS S.A.	2784
PERRY EQUIPMENT CORPORATION	6120
PERRY OCEANOGRAPHICS, INC.	4719
PETROLANE, INC.	3319
PETROLEUM EQUIPMENT GROUP JOY MANUFACTURING COMPANY	4509
PETROLEUM MACHINERY DIVISION GARDNER DENVER COOPER INDUSTRIES	1209
PETTIBONE HOUSTON	9733
PHILADELPHIA GEAR CORPORATION	6305
PHILADELPHIA RESINS CORPORATION	4725
PHILLIPS PRODUCTS CO., INC. SUB. OF PHILLIPS PETROLEUM CO.	3640
PHOENIX PRODUCTS COMPANY, INC.	2264
PLESSEY TELLUROMETER	4363
TRW PLEUGER	2335
POOL COMPANY, A SUBSIDIARY OF ENSERCH CORPORATION	9304
PORTA-KAMP MANUFACTURING CO.	4461
PORTA-TEST SYSTEMS, INC.	1538
POSI-SEAL INTERNATIONAL, INC.	3572
POWER IGNITION CO.	6745
POWER SYSTEMS DIV.	4964,9711
POWER SYSTEMS DIVISION UNITED TECHNOLOGIES	4112,9333
PRECISION URETHANE & MACHINE INC.	2763
PREMIUM THREADING SERVICE A DIVISION OF OTIS ENGINEERING	7124
PRINCE VALVE, INC.	3774
PRODUCTION SPECIALTIES DIV. DANIEL INDUSTRIES, INC.	2479
PRODUCTS RESEARCH & CHEMICAL CORPORATION	6124
PROGRESS EQUIPMENT COMPANY, INC.	4058
A/S PUSNES MARINE AND OFFSHORE SERVICES	2433,2449
PWA PACIFIC WESTERN HERCULES & RESUPPLY	6527
PYLE-NATIONAL CO.	2691
PYRAMID MANUFACTURING COMPANY	4258
QUALITY VALVE & MACHINE WORKS INC.	7308
RADAR DEVICES, INC.	3152
RAMNAS	1375
RAMTEK CORPORATION	6901
RATCLIFF HOIST COMPANY, INC.	6208
RAYMOND INTERNATIONAL INC.	3539
RAYTHEON COMPANY	3585
RCA AVOINICS	6670
READING & BATES	1331
READING AND BATES CONSTRUCTION	7302
REAMCO, INC.	4543
RED FOX INDUSTRIES, INC.	3933
RED FOX MACHINE AND SUPPLY CO.	3933
TRW REDA PUMP CO.	2335

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In over 40 years of shipbuilding, we've learned a lot about marine repair.

Keeping downtime to a minimum is one of the most important considerations when you're in need of marine repair services. Since no one knows towboats and barges like the craftsmen who build them, no one is better qualified to give you cost effective, fast service than Jeffboat.

Jeffboat does all major metal structural repairs, hull repairs, engine work and everything in between. With every conceivable discipline necessary for marine repair right on the premises.

But just because they're big doesn't mean you don't get personal service. That's something you can count on from Jeffboat, along with genuine concern for your individual needs.

A combination of pride, experience and superior craftsmanship has made Jeffboat America's largest inland shipbuilder. A sincere desire to make these special resources available to you—regardless of the size of the repair job—assures you dependable, highly economical service with a minimum of downtime.

For more information on marine repair call: Ken Wise or Kenny Howe, (812) 288-0425 or (812) 288-1044 (24 hours).

JEFFBOAT

America's largest inland shipbuilder.

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Exhibitor	Booth
REED AMERICAN	4359
REGAN OFFSHORE INTERNATIONAL INC.	2311
RENEAU INTERNATIONAL	9329
RICHARDS & WALLINGTON INDUSTRIES LTD.	3347,3351
C.A. RICHARDS & ASSOCIATES, INC	4410
RILEY-BEAIRD, INC	2811
ROCKWELL INTERNATIONAL FLOW CONTROL DIVISION	3593,9321
ROCKWELL INTERNATIONAL	3685
ROCKWELL INTERNATIONAL AUTONETICS MARINE SYSTEMS DIV.	3794
ROCKWELL INTERNATIONAL AUTONETICS MARINE SYSTEMS DIV.	7201
ROLLS ROYCE CANADA LTD	1211,1291
ROSS HILL CONTROLS CORPORATION	4661
ROWAN COMPANIES INC	3552
RSV GUSTO ENGINEERING	1475
RSV (RHINE-SCHELDE-VEROLME ENGINEERS AND SHIPBUILDERS	1475
RUSTON GAS TURBINES LTD	3347,3351
RUTH BERRY PUMP DIV DANIEL INDUSTRIES, INC.	2479
RYAN RAMP, INC	3734
S & N PUMP COMPANY, INC	2649
S.A.C.M.	2133,2233
S.H.B.M.	2133,2233
S.M.E.I.	2133,2233
SAIPEM (ENI GROUP)	7125
SALTECH CORP	6239
SALZGITTER STAHL GMBH	1655
SAMPSON OCEAN SYSTEMS	3589
SAMSON OCEAN SYSTEMS, INC	3660
SANDISLE STRUCTURES LTD	1211,1291
SANTA FE INTERNATIONAL CORP	3713
SATELLITE SERVICES	9447
SATELLITE TECHNOLOGY INC	1755
SCHLUMBERGER OFFSHORE SERVICES	1405
SCHOTTEL OF AMERICA, INC	4031
SCHRAMM, INC	9720
SCHUMACHER CO., INC	1737
SCIENTIFIC DRILLING CONTROLS	2743
SEA TANK CO	2133,2233
SEA-CON-SERVICES	2711
SEACOAST ELECTRIC	4049
SEAFORTH MARITIME LTD	3347,3351
SEAHORSE, INC	3319
SEAWARD INTERNATIONAL, INC	4221
SEDCO-HAMILTON PRODUCTION SERVICES	1401
SEDCO DRILLING DIVISION	1401
SEDCO ENERGY CORP	1401
SEDCO, INC	1401
SELBY, BATTERSBY & CO	2667
SEMBAWANG ENGINEERING (PTE.) LTD	2854
SEMBAWANG SHIPYARD LTD	2854
SEPCO INDUSTRIES	1731
SERCEL INCORPORATED	6929
SERVCO, DIV. OF SMITH INTERNATIONAL	2405
SES, INCORPORATED	2006
SHIBATA IND. CO., LTD	3589
SHIPCO INC	7116
SIGMA ENTERPRISES, INC	4021
THE SIMMONS GROUP OF COMPANIES	6527
SIMRAD A/S, OFFSHORE DIV	2433,2449
THE SIMTRAN CORPORATION	2765
SINGLE BUOY MOORINGS INC	3211
SIOUX STEAM CLEANER CORPORATION	6113
SKAGIT CORPORATION	4647
SKF STEEL	1375
SKINNER BROS. CO., INC	3642
SKYTOP/BREWSTER	4035
SLANZI OF NORTH AMERICA	7033
SLATTERY EQUIPMENT CO	6501
SMIT INTERNATIONAL MARINE SERVICES	1457
SMIT INTERNATIONAL (AMERICAS) INC.	3642
SMIT INTERNATIONAL BV	3642
SMIT INTERNATIONAL MARINE SERVICES B.V.	3642
SMIT INTERNATIONAL OCEAN TOWAGE AND SALVAGE CO.	1457
SMIT INTERNATIONAL TRANSPORT BV	3642
SMIT LLOYD B.V.	1457
SMIT TAK INTERNATIONAL SALVAGE	1457
SMITH INTERNATIONAL, INC	2405
SMITH TOOL DIV. OF SMITH INTERNATIONAL	2405
THE SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS	1115
SOFEC, INC	3267
SOLAR TURBINES INTERNATIONAL	1501
SOLUS OCEAN SYSTEMS, INC	3759
SOUND POWERED TELEPHONE CO. LTD	3347,3351
THE SOUTHAM ENERGY GROUP	6527
SOUTHERN BOLT & FASTENER CORP	4024
S.P. RADIO A/S HOBROVEJ	1381
SPAN INSTRUMENTS, INC.	4215
SPECIAL PRODUCTS DIVISION OF OTIS ENGINEERING CORPORATION	7122
SPECIALTIES COMPANY AND COPPER STATE RUBBER CO.	4005
SPECIFIC EQUIPMENT COMPANY	2754
SPERRY MARINE SYSTEMS	3693
SPERRY-SUN, INC	4525
SPRUNG INSTANT STRUCTURES LTD	6527
ST. LOUIS SHIP DIVISION OF POTT IND.	1175
STAL-LAVAL, INC	2275
STATE BOAT CORPORATION	3548
STEEL-FLO DIV. OF VADA INDUSTRIES	6527
STEVEN MOORING HOOK	3589
STEWART & STEVENSON SERVICES	3511
STRATOFLEX, INC	4475
SUB SEA OIL SERVICES	7213
SUB SEA SYSTEMS, INC	3782
SUBSALVE INDUSTRIES, INC	6561
TRW SUBSEA PETROLEUM SYSTEMS INC	2335
SULZER BROS., LIMITED	4565
SUMITOMO CORPORATION	1573,1673
SUMITOMO HEAVY INDUSTRIES, LTD	1573,1673
SUMITOMO METAL INDUSTRIES, LTD	1573,1673
SUMITOMO OCEAN DEVELOPMENT & ENGINEERING CO., LTD	1573,1673
SUN SHIP, INC	6751
SUPERIOR DIVISION TRICO INDUSTRIES, INC.	4044
SWAN HUNTER (TRINIDAD) LTD	2854
SWECO, INC	1653
SWEDISH CHAIN SALES CORP	3261
SWEDYARDS DEVELOPMENT	1375
SYLVESTER UNDERSEAS INSPECTION	4004
SYSTEM DEVELOPMENT CORPORATION	1532
SYSTEMS ENGINEERING DIV DANIEL INDUSTRIES, INC.	2479
SYSTEMS FABRICATION CORP	4475
T/DRILL INC	6770
TAYLOR DIVING & SALVAGE CO., INC	3401
TAYLOR OIL TOOLS	3534
TBW INDUSTRIES, INC	1435
TECHNIP GEOPRODUCTION	2133,2233
TELEDYNE	1307
TELLUROMETER U.S.A.	4363
TENVIG OFFSHORE A.S.	2433,2449
TETRA TECH, INC	3561
TEXAS ELECTRONICS CO	3247
TEXAS IRON WORKS, INC	1134
TEXAS REAMER CO	6538
THERMAL DYNAMICS	9328
THOMAS INSTRUMENT & MACHINE CO., INC.	3289
3M COMPANY ENVIRONMENTAL SPECIALTIES	2783
THYSSEN DRAHT AG	1755
THYSSEN GROUP COMPANIES	1755
THYSSEN INC./ DIVISION THYSSEN STEEL HOUSTON	1755
THYSSEN RHEINSTAHL TECHNIK	1755
THYSSEN STAHLUNION GMBH	1755
TIDELAND SIGNAL CORP	4547
TIDEWATER MARINE SERVICE, INC	4011
TK VALVE & MANUFACTURING, INC	2121
TOOKE ENGINEERING, INC	4026
THE TORRINGTON COMPANY	1159
TOTCO A DIVISION OF BAKER INT'L	3317
TRANS-TOW LIMITED	6505
TRANSAMERICA DELAVAL INC./ GEMS SENSORS DIVISION	4838
TRI OCEAN ENGINEERING LTD	1211,1291
TRI/FLO INDUSTRIES INTERNATIONAL	9727
TRW, INC	2335
GH-TTE	2359,9625
TWIN DISC, INCORPORATED	3147
THE UGLAND GROUP	2433,2449
UIE/GEM HERSENT/TECHNIGAZ	2133,2233
UNBRAKO DIVISION SPS TECHNOLOGIES	6133
UNIFLEX RIG COMPANY LTD	6527
UNION CARBIDE CORPORATION LINDE DIV., COATINGS SERVICE	4054
UNION WIRE ROPE	1503
UNIROYAL, INC	2857
UNIT CRANE & SHOVEL CORP	3148
UNITED STATES COAST GUARD	6202
THE UNITED STATES NAVY	7023
UNITED TECHNOLOGIES CORPORATION	4112,9333
UNITED TOWING LTD	3347,3351
UNITOR SHIPS SERVICE A/S	2433,2449
UNIVERSAL JOINT SERVICE, INC	3698
VAN LEEUWEN PIPE & TUBE	1473
VETCO INC., A SUBSIDIARY OF COMBUSTION ENGINEERING, INC.	4329,4425
VICINAY INTERNATIONAL COMPANY	2634
VICTORIA MACHINE WORKS	2863
VIDEO COMMUNICATIONS, INC	6409
J. M. VOITH GMBH	1774
VRIJHOF ANCHORS B.V.	1475
VULCAN IRON WORKS INC	1740

W-K-M DIVISION, ACF INDUSTRIES INCORPORATED	4208
W.B. ARNOLD CO., INC.	3261
WABCO— AMERICAN STANDARD	2379
WASHINGTON CHAIN & SUPPLY	2698
WATERCRAFT AMERICA, INC.	4846
WEATHERFORD INTERNATIONAL	1433
WEIR PUMPS LIMITED	3347,3351
WEST SIDE MARINE, INC.	6546
THE WESTERN COMPANY OF NORTH AMERICA	9811
WHITTAKER CORPORATION SURVIVAL SYSTEMS DIVISION	2211
WIDDER CORP.	6524
WIJSMULLER B.V.	1475
WILLIS OIL TOOL, DIV. OF SMITH INTERNATIONAL	2405
WILSON & HAYES, INC.	7204
WILLIAM B. WILSON MFG. CO	6338
WIRTH GMBH	6560
WITS AMSTERDAM B.V.	1475
WOMACK MACHINE SUPPLY COMPANY	2775
WOOLSEY MARINE INDUSTRIES, INC.	2749
THE YOKOHAMA RUBBER CO., LTD.	1573,1673
YORK DIVISION, BORG WARNER CORP.	4860
ZAPATA CORPORATION	3617
ZIEELE/ASSOCIATED FLOW CONTROLS	4374

Admiral C.R. Bryan To Head Webb Institute

Vice Adm. **C.R. Bryan,** USN, has been named as president of Webb Institute of Naval Architecture, it was announced recently by **Frank J. Graziano,** chairman of the board of trustees. Admiral **Bryan** will assume his duties on July 1, succeeding Rear Adm. **C.N. Payne**. Admiral **Bryan** is presently Commander, Naval Sea Systems Command, Washington, D.C.

Adm. C.R. Bryan

Admiral **Bryan** holds the Graduate Professional degree of naval engineer from Massachusetts Institute of Technology and the Bachelor of Science degree from the United States Naval Academy. During his career as an engineering duty officer in the U.S. Navy, he has had extensive experience in the repair, design and construction of Naval ships. He is presently the president of the American Society of Naval Engineers and a member of The Society of Naval Architects and Marine Engineers.

His engineering education services include the post of senior advisor to the Chief of Naval Personnel for the Education and Training of Engineering Duty Personnel of the Navy, and membership on the visiting committee for the Department of Ocean Engineering, Massachusetts Institute of Technology.

Webb Institute of Naval Architecture, founded in 1889 and located in Glen Cove, N.Y., is the only four-year college in the United States solely devoted to education in the field of naval architecture and marine engineering. It is a fully accredited private school which awards the degree of bachelor of science to its graduates.

PHB Receives Contract For Offshore Bulk Unloading Terminal In Argentina

PHB-Fordertechnik of West Germany has been awarded a contract for the construction of an import/export transshipment terminal for loading and unloading ores, coal, cereals, and fertilizer from one ship to another. A reconstructed bulk carrier is to be the basis of the new facility. It will include two ship-loader/unloaders for the handling of bulk cargo, each with a capacity of 1,000 tons per hour; bunkers, vibrating troughs, individually controlled belt conveyor systems for each loader, and facilities for dust-free loading of small oceangoing ships. The terminal will unload vessels of up to 200,000 dwt, and load, by means of a special transfer system, smaller ships and oceangoing barges up to 30,000 dwt. These small ships and barges will provide shuttle service for industrial plants at the harbor of Buenos Aires and the Rio de la Plata.

The contract is valued at approximately 11 million Deutschmarks, and consists of consultation, planning, construction and commissioning of the terminal.

PEMEX Signs Contract For IMODCO Terminal

Petroleos Mexicanos (PEMEX), the national oil company of Mexico, has signed a contract with IMODCO, Los Angeles, Calif., for supply of a Single Point Mooring Terminal System for operation in the Gulf of Mexico. Measuring 12.5 meters in diameter (about 41 feet), the standard CALM system has 2x24″ and 1x16″ diameter cargo piperuns and a two-grade MPDU. The already constructed terminal is scheduled to become operational this spring.

The contract continues IMODCO's close business relationship with PEMEX. Since 1972, IMODCO has supplied a total of eight SPM systems for operation off both the Pacific and Gulf of Mexico Coasts. These terminals have assisted Mexico in effectively exporting its sizeable oil reserves.

IMODCO, a pioneer in the development of Single Point Mooring Terminal Systems, is a unit of AMCA International Corporation, a major diversified group of heavy industrial, engineering, manufacturing and construction companies whose products and services are sold worldwide.

Emmett C. Lee Jr. Named Tampa Port Director

Emmett C. Lee Jr. was named port director by the Tampa, Fla., Port Authority board at their recent business meeting. Mr. **Lee** has served as deputy port director for the Authority since December 1978.

Mr. **Lee** is a graduate of the U.S. Military Academy at West Point, N.Y., and received his master's degree in civil engineering from the University of Illinois.

He succeeds **Joseph W. Gontarski,** who tendered his resignation to the Port Authority board February 12.

Danish C.G. To Use Seaward Fenders In Oil Pollution Control System

Seaward International's Sea Cushion® marine fenders are now a key part of the Danish Coast Guard's oil pollution control equipment. The three large 8 by 12-foot fenders will be in the North Sea, Baltic Sea, and other Danish coastal waters. They will be placed between the salvage vessel and stricken vessels, which have been damaged or have run aground. This will permit the transfer of fuel or oil cargo from the disabled vessel before the oil can spill into the sea.

Sea Cushion® marine fenders for the Danish Coast Guard.

These fenders are the same size as the Sea Cushions previously supplied to the United States Coast Guard Pollution Control Strike Team. They are designed to be transported in a C-130 aircraft, by helicopter, or on a single truck for good mobility.

Sea Cushion fenders are filled with resilient energy-absorbing foam and covered by an abrasion-resistant elastomer jacket reinforced by thousands of feet of continuous nylon cord. Additionally, these Sea Cushions are enclosed in an orange-colored elastomer coated, nylon web net which is designed for safety, high visibility and structural support. Sea Cushions are also available with other net styles, including a chain net with tires.

For further information on Seaward International's Sea Cushion fenders, contact **Sidney H. Shaw,** Seaward International, Inc., 6269 Leesburg Pike, Falls Church, Va. 22044.

Three Contracts For British Shipbuilders Total $112 Million

British Shipbuilders have reported receipt of contracts for work on five ships totaling about $112 million.

Goyan Shipbuilders has received a contract from Overseas Containers to convert two containerships from steam turbine to diesel power. Completion is scheduled for the spring of 1981.

The Sultanate of Oman has placed an order with the Porchester, Hampshire, shipyard of Vosper Thorneycroft UK to build a 56-meter (about 184 feet) patrol craft.

Smiths Dock Co., Middlesbrough, has signed a contract with Geest Industries, Ltd., Spalding, Lincolnshire, to build two refrigerated cargo vessels for delivery in 1981.

T.J. Farrell Heads Ottawa Office Of Newport News Shipbuilding

Terence J. Farrell has been named director of marketing-Canada for Newport News Shipbuilding with headquarters in Ottawa.

Terence J. Farrell

Mr. **Farrell** has an extensive background in the Canadian shipbuilding industry. Until recently, he was vice president, marketing of Marine Industrie Ltee., and director of the Canadian Shipbuilding and Ship Repairing Association. His experience also includes positions with Vickers Canada and Chase Nuclear Canada.

Mr. **Farrell** is a professional engineer registered in Quebec, Ontario, and the U.K., and is a director of the Canadian Nuclear Association. He holds a master's degree in engineering from Ecole Polytechnique, Montreal.

Newport News Shipbuilding, a Tenneco company, operates one of the largest shipyard facilities in the U.S., including complete foundry, machining and fabrication capabilities.

It has been a leader in constructing, refueling and servicing of nuclear-powered ships, and has extended this expertise to the service of the commercial nuclear power utility industry.

Newport News Shipbuilding now brings to Canadian industry more than 25 years of experience with nuclear powerplants; its participation in tests of crude oil carriers through Arctic waters; its experience in construction of large carriers for oil and liquefied natural gas; and the expertise of its subsidiaries, Newport News Industrial Corporation and Newport News Offshore Systems Corporation.

The Newport News Shipbuilding offices in Canada are located at 170 Laurier Avenue, West, Suite 1200, Ottawa, Ontario K1P-5V5.

William P. Patterson Joins Hoffert Marine, Inc.

William P. Patterson has joined the marine engineering division of Hoffert Marine, Inc., Jacksonville, Fla. Hoffert Marine is a leading supplier of deck and engine supplies and services for merchant and naval vessels.

Mr. **Patterson**, who has long experience in the field of marine engineering, served as port engineer for National Bulk Carriers in Yokohama, Japan, during the construction of the Universe class of tankers, and in Ireland for that company in the same capacity but concerned with the repair and maintenance of National Bulk Carriers ships. Mr. **Patterson** was also associated with Jacksonville Shipyards in production management, contract negotiating and estimating.

Mjellem & Karlsen Of Norway To Build Two Oceanographic Vessels

Two oceanographic research vessels, one for the University of Mexico, the other for the University of Bergen, Norway, will be built by the Norwegian firm A/S Mjellem & Karlsen, specialists in the design and construction of such vessels. Both universities will be carrying out similar investigations covering a wide range of activities in physical and chemical oceanography, geology, geophysics and biology.

The ships are based on the yards Nansen-class research vessels, of which four have been built so far. These flexible vessels have a very low hydroacoustic noise level, enabling the use of hydroacoustic instruments at near full speed. Various stern trawls are

Artist's drawing of the oceanographic research vessels to be built by Mjellem & Karlsen for the University of Bergen, Norway, and the University of Mexico.

employed for launching, towing, and retrieving oceanographic sampling equipment. Several cranes and winches, arranged for maximum flexibility, are mounted around the spacious aft deck so as not to obstruct it. The laboratories and instrumentation are designed for adaptability and easy expansion if the need arises.

The Norwegian vessel will have built-in seismic capability, while the Mexican vessel will use skid-mounted equipment when necessary. Main particulars for the Mexican vessel are as follows: length overall, 50.25 meters (165 feet); breadth, 10.30 meters (34 feet); depth to shelter-deck, 6.50 meters (21 feet); draft, 4.30 meters (14 feet); speed, approximately 13 knots, and duration of cruises, one month.

The A/S Mjellem & Karlsen yard, which employs approximately 500 people, was established in 1891, and is situated near the center of Bergen.

For further information, contact **Fredrik Sundbve**, The Export Council of Norway, 800 Third Avenue, New York, N.Y. 10022.

PASSING HISTORY — Outward bound for successful sea trials from Bath Iron Works, a Congoleum company, the U.S. Navy guided missile frigate Clark (FFG11) recently passed historic Fort Popham, Maine, built during the Civil War to guard entrance to the Kennebec River. Heading for sea six weeks ahead of schedule, the Clark is one of a new generation of versatile frigates described as "the most successful ship development and construction program in modern Navy history."

Finnish Yard Receives Contract For Chemical Product Carrier

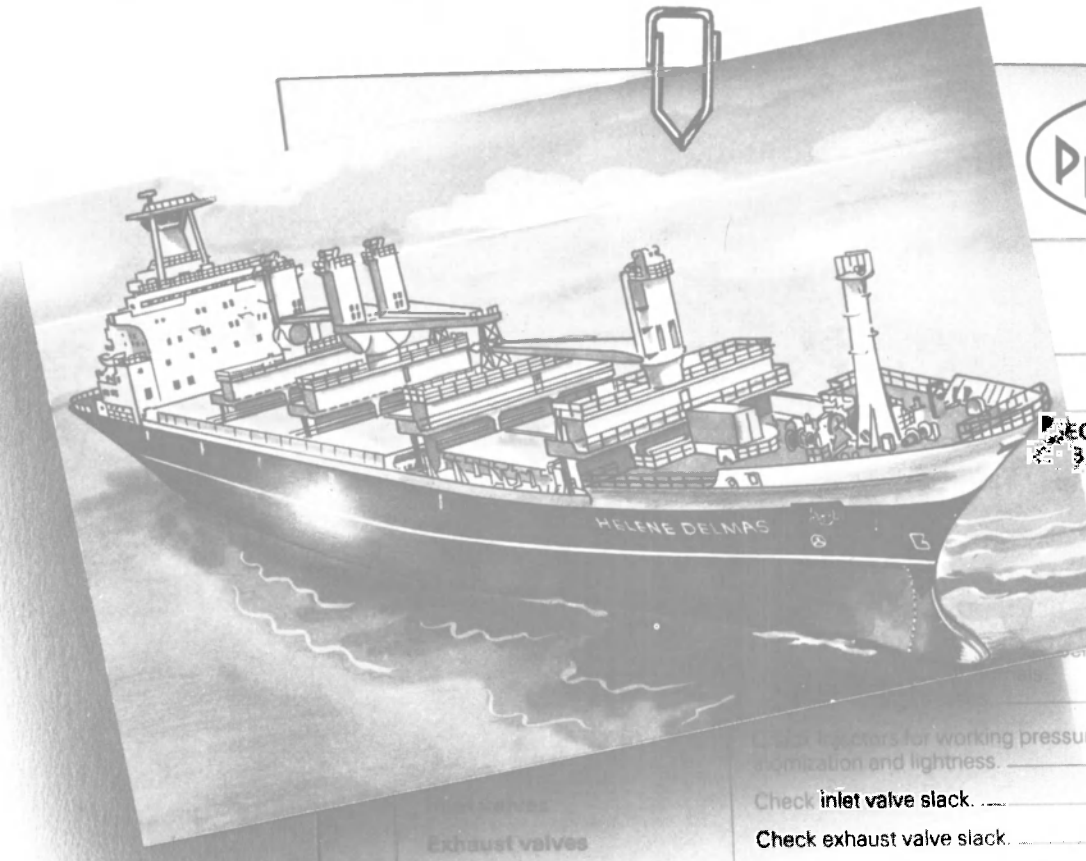
Profile drawing of the 3,500-ton chemical tanker to be built at Finland's NavireYard.

Polttoaine Osuuskunta (Aspo-group) of Helsinki, Finland, has ordered an ice-strengthened 3,500-dwt chemical tanker from the NavireYard in Naantali, Finland.

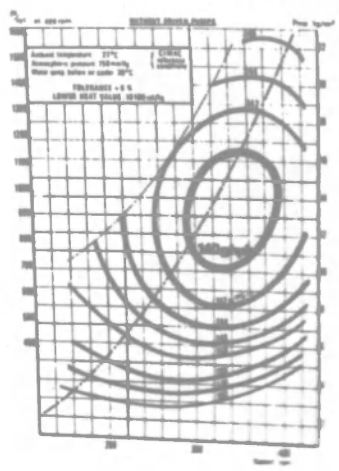
The six center tanks of the ship will be made of stainless steel, and the 10 wing tanks will be specially coated to withstand corrosive chemicals. Each tank will have its own cargo pump, enabling the vessel to transport several different kinds of cargo at the same time.

The length of the vessel is 87 meters, draft 6.2 meters, beam 14 meters (about 285 feet by 20 feet by 46 feet), and it will have a speed of 14 knots. The main engine, a 3,000-bhp medium-speed diesel, will be coupled to a controllable-pitch propeller through reduction gears.

The ship will be built at the NavireYard from sections made by Navire's factory in Parainen. The hull will be towed to Norway, and outfitted at Vaagen Verft Shipyard for delivery in the autumn of 1981.



Test results, confirmed in operation.



...n and power ...according to RPM and BMEP ...ven pumps).

Tolera...	+ 2 %
Le... alorific value (10...0 kcal/kg)	42,280 kJ/kg
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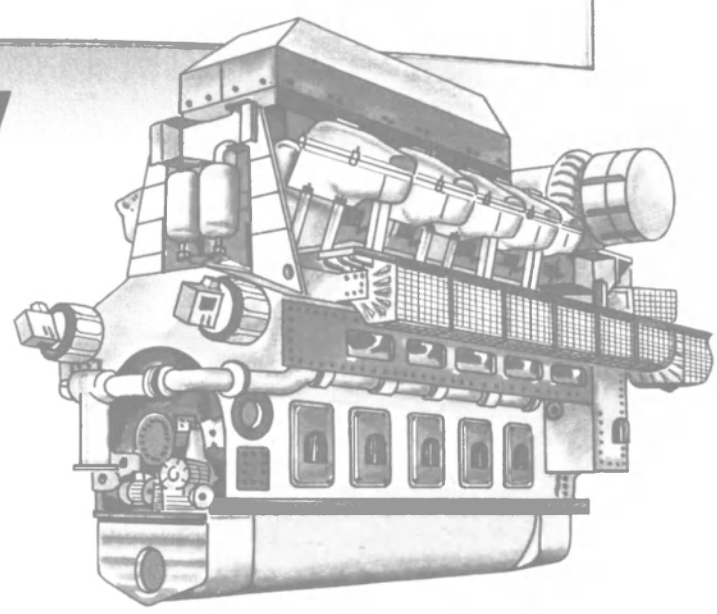
Air cooler inlet water temperature	30 °C

economy, reliability



Economy and reliability. Two main features verified on test bench and checked, afterwards, in operation.
Economy due to low consumption : 140 g/hph.
Consumption is decreasing, but power remains.
Reliability confirmed during maintenance checks : low wear and excellent pistons surface smoothness.
Economy and reliability of PC4 means a reduction of operation cost !

ALSTHOM-ATLANTIQUE

Groupe Diesel

2, quai de Seine - 93203 Saint-Denis - France - Telephone 820.61.91 - Telex 620 333 F Motla

USCG Cutter Contract Spurs $4-Million Expansion At Tacoma Boatbuilding

With construction underway on four newly designed W-MEC 270-foot cutters for the U.S. Coast Guard, Tacoma Boatbuilding Co. has expedited completion of a new 8.6-acre shipyard near its two other main yards on Puget Sound's Commencement Bay.

"We broke ground for the new yard in April 1978, and were burning steel for the first cutter in six months," reported **Robert M. Hill**, vice president, marketing, for the long-established Northwest firm. "A capital investment of over $4 million put us right on our production schedule — the first hull is almost complete, the second is 45 percent complete, and we've started cutting steel for the third."

The contract for the four medium endurance cutters started out at $110 million and has increased to $130 million through change orders, with a substantial additional increase due to escalation, Mr. **Hill** said.

Enclosed steel fabricating shops account for 50,400 square feet of the new facility, according to yard manager **Gus Lange**. An additional 3,000 square feet houses yard administration and engineering liaison. Two 35-ton whirleys flank the two 448-foot-long, 116-foot-wide launching ways. Way foundations are 12-foot-thick concrete poured over an existing bed and pilings from World War II ways on the old Todd-Pacific shipyard site.

Major new equipment includes a CM-100 numerically controlled plasma arc burning/cutting machine, a company-built 300-ton hydraulic press, a 750-ton Pacific hydraulic press brake, and an Erie pyramid plate bending roll. The plasma arc cutter works over two tables, each of which accommodates two 10-foot by 40-foot plates for the simultaneous cutting of left and right mirror-image shapes.

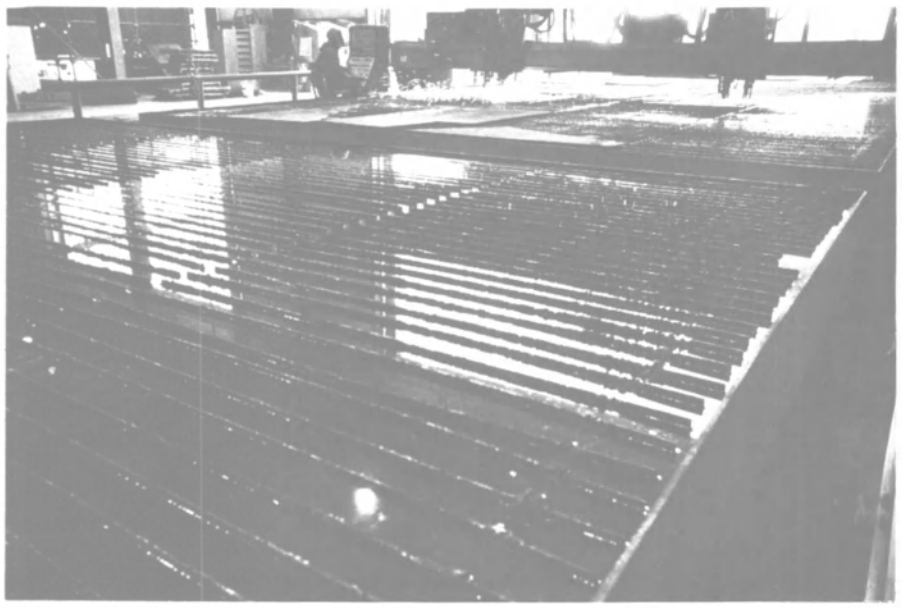
Additional facility revisions for company management and a 200-man engineering staff are currently underway.

At Tacoma Boat's other yards, work continues on several 245-foot gunboats for the U.S. Navy and 140-foot icebreaking tugs for the U.S. Coast Guard.

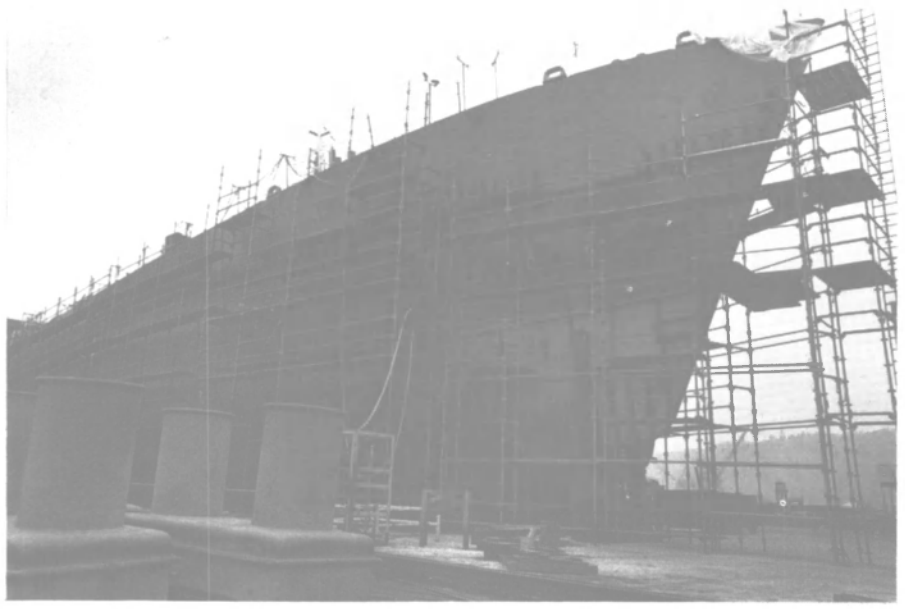
Although current emphasis is on military and marine transportation needs, Mr. **Hill** sees Tacoma Boat's expanded capabilities paying off for the fishing industry as well.

"Fishermen tell me that to be successful tomorrow, trawlers as large as 300 feet and boats with much more onboard processing equipment will be a necessity rather than a luxury," Mr. **Hill** said.

Tacoma Boat's half-century of experience actually started with salmon trollers in the 1930s. Since then, the firm has constructed vessels of all types—including the free world's largest (258-foot) tuna superseiner, ice-class tugboats, coastal tugs, a large semi-submersible offshore drilling rig, and patrol boats and combat vessels for allied navies around the globe.



CM-100 numerically controlled plasma arc burning/cutting machine. Shown here, is the cutting of the "chocks and brackets" for the CGC Tampa, the second of four cutters under contract. It is scheduled for delivery in March 1982.



A medium endurance cutter currently under construction at Tacoma Boat.

Alaska Shipping Co. Acquires Alaska Marine Shipping

Alaska Shipping Company, Seattle, Wash., a wholly owned subsidiary of The Aleut Corporation, has recently acquired Alaska Marine Shipping. While this acquisition changes the name of the firm from Alaska Marine Shipping to Alaska Shipping Company, the overall business of providing freight service between the Seattle and Alaska markets will remain the same. **Agafon Krukoff**, president of Alaska Shipping Company, stated that the acquisition will significantly improve both freight services and customer satisfaction through expanded managerial, customer relations and financial capabilities.

Alaska Shipping Company will provide monthly freight service for cargo consigned to fisheries and fishing vessels in the Aleutian Region, and to numerous ports of call, including Chignik, Sand Point, Squaw Harbor, King Cove, False Pass, Akutan, Dutch Harbor, St. Paul, St. George Captains Bay, and Kodiak Island.

Posidonia 80—International Shipping Exhibition To Be Held In Greece June 2-7

Posidonia 80, the international shipping exhibition, is expected to be the most representative show ever. Over 600 companies from 40 countries will exhibit their hardware and services in Piraeus, Greece, June 2-7.

Posidonia 80 is sponsored by the Greek Ministry of Mercantile Marine, the Union of Greek Shipowners, the Greek Chamber of Shipping, the Association of Shipowners of Greek Passenger Ships, and the Greek Shipping Co-operation Committee.

This will be the seventh biennial Posidonia Exhibition, and for the third time it will be held at the St. Nicholas Terminal Building on the Piraeus waterfront adjacent to Akti Miaouli, at the heart of the international Greek shipping market.

For further information, write **Peter Brierley**, Stratics Consultants Limited, 35 Craven Street, London WC2N 5NQ, England.

Petro-Marine Receives Production Platform Design Contract

Tenneco Oil Company has engaged Petro-Marine Engineering, Inc. to design the production platform for Ship Shoal Block 170 in the Gulf of Mexico.

The four-pile structure to be located in a water depth of 58 feet will be connected by a bridge to the drilling platform.

Petro-Marine Engineering is one of the nation's leading independent consulting engineering firms serving the oil industry. The company maintains offices in Gretna, La., near New Orleans, Houston, Texas, Lafayette, La., and London, England.

NABRICO Names 2 New Stocking Distributors

Brown Marine Service, Inc. of Pensacola, Fla., and Peltz Brothers, Inc. of Norfolk, Va., have been named stocking distributors for Nashville Bridge Company (NABRICO) products in their respective areas.

T. Ray Jackson, vice president of NABRICO, said Peltz Brothers would represent NABRICO in the "tidewater" area, and Brown Marine Service would represent the company in southern Alabama, southern Georgia, and the entire state of Florida.

Both companies will stock a wide variety of NABRICO products, including winches, hatches and other deck hardware items.

According to Mr. **Jackson**, NABRICO currently has seven stocking distributors located in major coastal cities throughout the United States, and a license agreement with De Biesbosch-Dordrecht of the Netherlands to manufacture and distribute NABRICO winches in Europe and Africa.

Founded in 1916, Peltz Brothers, Inc. is headed by **Arthur Rosenfeld**. **Alan** and **Jack Peltz** are in charge of the sale of deck fitting equipment for the company.

The Brown family, having been in the marine business for more than 100 years, founded Brown Marine Service, Inc. in the 1930s. The company is headed by **S.J. Brown**. **Ted Brown** is in charge of the sale of deck fitting equipment.

NABRICO is a wholly owned subsidiary of The American Ship Building Company, Cleveland, Ohio. Headquartered in Nashville, Tenn., NABRICO has been in the marine field for more than 60 years and is primarily concerned with the design, engineering and construction of grain and coal barges, deck barges, liquid tank barges, cement barges, drydocks and towboats. NABRICO is a major supplier to the entire marine industry of marine deck hardware. The company, which has plants in Nashville and Ashland City, Tenn., pioneered the design and building of much of the modern equipment used on rivers today.

Strater Promoted To Northeast Sales Manager At EPSCO Marine

Minshall G. Strater has been appointed Northeast sales manager, Commercial Products, of EPSCO Marine, Division of EPSCO, Inc. He succeeds **George E. Lariviere,** who now holds the position of general manager of EPSCO's new Gulf Coast office in New Orleans, La.

In his new position, Mr. **Strater** will be responsible for all sales activities in the New England, Mid-Atlantic, and Great Lakes region. EPSCO's commercial marine products include Loran-C receivers, track plotter, medium and heavy-duty radar, recorders, net monitor, autopilots, A.D.F., and the new color video sounders—all sold through a network of EPSCO Marine dealers.

Mr. **Strater's** prior experience with EPSCO as Mid-Atlantic sales representative has established him as very knowledgeable in the commercial fishing industry and a person well respected by the dealer network. Mr. **Strater** joined EPSCO with considerable sales experience, having held various sales responsibilities with ADT in Bridgeport, Conn., and GBC CCTV New England Corporation in Boston, Mass.

1977 Inland Waterborne Commerce Statistics Available From AWO

The 1977 edition of AWO's Inland Waterborne Commerce Statistics is now being mailed to all designated representatives, as well as other interested parties. Copies of the publication, which provides information on the industry's operating fleet as well as commodity movements on major rivers, are available from American Waterways Operators, Inc., 1600 Wilson Boulevard, Suite 1101, Arlington, Va. 22209.

E. Shaprut To Head Voith Schneider America

The Marine Division of J.M. Voith GmbH recently elected **E. Shaprut** to head their Voith Schneider America branch. The establishment of this branch is designed to further enhance and improve direct services to the American market.

E. Shaprut

Mr. **Shaprut** is a graduate naval architect and marine engineer from the shipbuilding faculty of the Technical University of Vienna, with an undergraduate degree in mechanical engineering. He is also a graduate of the Marine Academy, with seven years' sea time as deck officer and a license of first mate. His experience includes the development and construction of fiberglass craft, engineering, construction, construction supervision, contract management, operation, marketing, and service for VLCCs, LNG/LPG tankers, terminals, and diesel engines. He is a member of SNAME, ASME and The Propeller Club of the United States.

Mr. **Shaprut** believes that the Voith Schneider Propulsion system can contribute to the improvement of safety in harbors and waterways throughout the USA. The VSP enables a vessel to make precise and quick collision-preventing maneuvers under adverse conditions, and to exercise soft steepless berthing. The VSP tractor is a simple, safe and efficient tug, able to steer and stop a large vessel in distress with a greatly reduced risk of capsizing. Mr. **Shaprut** feels this increased safety factor can contribute to the prevention of accidents and resulting problems such as pollution, etc.

$5.7-Million Barge And Tug To Be Built— Title XI Requested

Morania Barge No. 470, Inc., 136 East 57th Street, New York, N.Y., has applied for a Title XI guarantee to aid in financing the construction of one bulk oil barge and one oceangoing twin-screw tugboat. The applicant is a subsidiary of Penn Industries of the same address.

Modern Marine Power, Inc., Houma, La., is the proposed builder of the 116-foot, 4,000-horsepower tug, with delivery scheduled for November 1980. S.B.A. Shipyards, Jennings, La., is the proposed builder for the 383-foot oil barge, scheduled for delivery in June 1980. The tug and barge would be used in coastwise and intercoastal trade.

The estimated actual cost of the tug is $2,646,818, and that of the barge, $3,119,578. The Title XI guarantee, if approved, would be for 87½ percent of the total cost, or $4,000,000.

Wager Offers Free 46 Page Equipment Catalog

A new 46-page Marine Catalog issued by the Robert H. Wager Co., Inc., provides current specifications and descriptive detail on the company's extensive line of Wager vent valves and smoke indicators, and on a variety of boiler accessories.

These Wager boiler accessories include viewports, boiler inspection lights, air-cooled stuffing boxes, and a normally open check valve that meets the requirements of the USN and the USCG on air scavenger lines to soot blower steam piping on water tube boilers.

Specifications cover Wager vent valves available from 1½ inches to 12 inches, in a range of materials, with or without covers; and smoke indicators supplied as visual, photoelectric, or visual/photoelectric units. Also detailed in this catalog is the Wager Combustion Optimizer, an electronic device designed to monitor and fine tune the air-fuel ratio of an automatic combustion control system.

For a free copy of the new Wager Marine Catalog, write to **Michael Wager,** Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928.

New Orleans Traffic & Transportation Bureau Elects Officers

William J. St. John Jr. has been reelected to a second term as president of the New Orleans Traffic and Transportation Bureau. Mr. **St. John,** senior vice president of W.R. Zanes & Co., was elected at the bureau's annual meeting at the New Orleans Board of Trade.

Other officers for 1980 are **Philip G. Kuehn,** president, New Orleans Cold Storage and Warehouse Co., Ltd., first vice president; **Chris S. Larsen,** vice president, Central Gulf Lines, Inc., second vice president, and **William A. Reeder,** retired, New Orleans Public Service Inc.

New members of the bureau's board of directors are **Charles R. Dixon,** president, Survey, Inc.; Lt. Gov. **James E. Fitzmorris; Andrew F. Flores,** director, Louisiana Department of Commerce and Industry; **John Meghrian,** Todd Shipyards Corp., and **Mrs. Paula L. Maher,** president for administration, Bergeron Industries, Inc.

The bureau is a nonprofit agency concerned with the improvement of all aspects of product shipping and distribution in the New Orleans, La., area. It operates as a supportive force of the port and area economy in the establishment of competitive pricing of transportation and service patterns, and assists members on the purchase of transportation services. The bureau makes presentations before federal and state agencies dealing with transportation and shipping.

General manager **Greg R. Perry** reported a marked increase in requests for the bureau's information and services. He said he anticipates continued brisk activity due to changes being discussed in government transport regulations.

$3.3-Million Bridge Demolition Contract Awarded XPLO Corp.

XPLO Corp., a New Orleans, La., firm specializing in underwater explosives technology and salvage operations, has been awarded a $3.3-million contract by the U.S. Coast Guard, which calls for the demolition and removal of the center span and piers of the Central New Jersey (CNJ) railroad bridge. The bridge crosses Newark Bay at Bayonne, N.J.

John Charpentier, XPLO president, said that work on the bridge is scheduled to begin this month, and will take approximately 90 days to complete.

The center span of the CNJ bridge consists of three steel sections, each approximately 150 feet long. Plans for removal call for the sections to be lowered by barge-mounted cranes. The barges will be towed away and the sections dismantled. An alternate plan is to demolish the three sections by explosives and then to salvage the remains from the riverbed. The piers supporting the bridge will be demolished by explosives. The CNJ bridge demolition represents the largest project of its kind ever undertaken by the firm.

XPLO Corp. is a subsidiary of Tidewater Contractor Services, Inc. Both companies are a part of the Contractor Services group of Tidewater Inc.

Thomas B. McCain Joins Savannah Machine And Shipyard As Treasurer

David H. Green, president, Savannah Machine and Shipyard Company of Savannah, Ga., recently announced that **Thomas B. McCain** has joined the shipyard as treasurer. As treasurer, he will be responsible for all financial, accounting and data processing functions.

Thomas B. McCain

Prior to joining Savannah Machine and Shipyard, Mr. **McCain** was a senior auditor with the firm of Touche Ross and Company for four years. During that time, he became a certified public accountant. He later joined Maurice P. Foly and Company as a controller.

He has 10 years' experience in the consulting, construction and real estate industries. His most recent assignment as controller was with Atlanta Center Limited.

Mr. **McCain** is a graduate of the University of Maryland, and is a member of the American Institute of Certified Public Accountants.

New Offshore Services Company Formed— Datadyne Associates

Bill Dalton and **Dave Porta**, formerly employed by Ocean Research Equipment, Inc., have formed Datadyne Associates.

The new company is available to provide special products and service to the offshore industry in the following areas: High Resolution Site Surveys; Environmental Engineering Studies; Underwater Acoustic Engineering for Subsea Completion and Other Sea Floor Engineering Tasks; Special Acoustic Product Design, Development, and Field Operation.

Both Datadyne founders have accumulated extensive experience through participation in a variety of offshore projects in the areas outlined above.

For more information, write to Datadyne Associates, Box A61, North Falmouth, Mass. 02556, or call (617) 563-2045.

Free Bulletin Describes Portable Cable Pull Tool

Columbus McKinnon Corporation recently published literature describing their Series 601 grip and pull cable tool. Up to 65 feet of cable increases the unit's operating potential. The portable unit has a ¾-ton capacity, and weighs 21 pounds. Under a full load, it requires only 75 pounds of handle pull. The Series 601 can be used for rigging, pulling, stretching or dragging.

For complete information on CM's Series 601, request Bulletin CMH-120 from **Walter Eising,** Dept. MR, Columbus McKinnon Corp., Fremont Street, Tonawanda, N.Y. 14150.

ABS Appointed Verification Agent In The U.S. For Offshore Fixed Structures

The American Bureau of Shipping (ABS) has been authorized to act as a "Certified Verification Agent" by the Geological Survey of the United States Department of the Interior to ensure that offshore fixed platforms and other structures meet federal standards. The standards apply to fixed structures designed, fabricated, and installed on the U.S. outer continental shelf as of January 1, 1980. They also apply to major modifications made after that date to existing structures.

"This appointment is significant to ABS as it recognizes our expertise with fixed offshore structures," **William N. Johnston,** chairman and president of ABS, stated. He noted that "The Bureau has more than 29 years of worldwide experience with the classing, surveying, inspection, and analysis of offshore structures."

The verification activities will be performed on behalf of the Geological Survey by ABS surveyors who are stationed in the Bureau's worldwide network of 174 exclusive offices, and by engineers in the Ocean Engineering Division based at the ABS International Headquarters in New York City.

The verification activities will be performed in accordance with the Geological Survey's Outer Continental Shelf (OCS) Platform Verification Program. The technical content of the program is based upon a document entitled "Requirements for Verifying the Structural Integrity of OCS Platforms," which was developed by ABS under a contract awarded to it in 1977 by the Geological Survey. The requirements were thoroughly reviewed during their development by personnel at ABS, the Geological Survey, and by specialists and consultants with experience in the offshore industry. The "Requirements" are almost totally performance oriented: they specify objectives that are to be satisfied in the design and construction of fixed platforms. This performance-oriented framework was adopted by the Geological Survey to provide the offshore industry with maximum flexibility in choosing design methods and procedures, as well as to ensure that the practices described in the regulations would be compatible with the present techniques used in the industry. The technology developed by the industry is incorporated in the design and construction of more than 3,000 fixed structures already installed off the West, Gulf, and Alaskan Coasts of the United States.

Two other documents were also prepared by ABS for the Geological Survey in conjunction with the "Requirements." The appendices present alternative engineering design procedures that may be utilized to conform to the "Requirements." The commentary describes the basic intent of the performance requirements and also discusses the current development of the state-of-practice for both the "Requirements" and appendices.

The American Bureau of Shipping is an 118-year-old international classification society that establishes standards, called "Rules," for the design, construction, and periodic surveys of a variety of marine structures.

SNAME Announces Committee Chairmen For 1980

Lester Rosenblatt, president of The Society of Naval Architects and Marine Engineers, recently announced the following committee chairmen for 1980:

Vice president—Advisory Public Service Committee—Donald P. Courtsal, vice president and general manager, Dravo Corporation, Engineering Works Division, Pittsburgh, Pa.

Applications Committee — Arnold Stein, assistant to the president, M. Rosenblatt & Son, New York, N.Y.

Awards Committee—Rear Adm. **Kenneth E. Wilson Jr.**, USN (ret.), Energy Venture Planning manager, Exxon Enterprises Inc., Florham Park, N.J.

Banquet Committee — Norman R. Farmer, manager, Systems Analysis Department, George G. Sharp, Inc., New York, N.Y.

Budget and Endowments Committee—William C. Freeman, consultant, Simsbury, Conn.

Dinner-Dance Committee — James G. Price, vice president, Norfolk Shipbuilding and Drydock Corp., Norfolk, Va.

Education Committee—William E. Zimmie, president, Zimmite Corporation, Cleveland, Ohio.

Fellows Committee — Prof. **Richard B. Couch**, Department of Naval Architecture and Marine Engineering, The University of Michigan, Ann Arbor, Mich. Honorary vice president of the Society.

Finance and Audit Committee—John A. Livingston, chairman emeritus, Webb Institute of Naval Architecture, Glen Cove, N.Y.

Journal of Ship Research Committee—Ralph D. Cooper, head, Fluid Dynamics Program, Office of Naval Research, Department of the Navy, Arlington, Va.

Marine Technology Committee —E. Scott Dillon, consultant, Silver Spring, Md. Honorary vice president of the Society.

Member Insurance Committee—Robert Axelrod, vice president-finance, J.J. Henry Co., Inc., New York, N.Y. Treasurer of the Society.

Membership Committee — William H. Hunley, Technical Director, Naval Sea Systems Command, Department of the Navy, Washington, D.C.

Nominating Committee—Monroe D. Macpherson, John J. McMullen Associates, Inc., New York, N.Y. Vice president of the Society.

Papers Committee—Capt. **Jack A. Obermeyer**, USN (ret.), manager, Marine Department, Texaco Inc., White Plains, N.Y.

Pension Committee — Douglas C. MacMillan, consultant, East Orleans, Mass. Honorary vice president of the Society.

Publications Committee — Roy L. Harrington, naval architect and technical manager, Newport News Shipbuilding, Newport News, Va.

Scholarships Committee—Capt. **Robert E. Stark**, USN (ret.), Gibbs & Cox, Inc., New York, N.Y.

Sections Committee — Monroe D. Macpherson, John J. McMullen Associates, Inc., New York, N.Y. Vice president of the Society.

Vice president-Technical and Research—Capt. **Richards T. Miller**, USN (ret.), (to whom the Technical and Research Advance Planning, the Technical and Research Finance and Administration and the Technical and Research Steering Committees report), naval architect and consulting engineer, Annapolis, Md.

Technical and Research Advance Planning Committee—Ronald K. Kiss, Director, Office of Ship Construction, Maritime Administration, Washington, D.C. Vice president of the Society.

Technical and Research Finance and Administration Committee—John T. Gilbride, chairman, Todd Shipyards Corporation, New York, N.Y. Honorary vice president of the Society.

Technical and Research Steering Committee—Rear Adm. **Randolph W. King**, USN (ret.), executive officer, National Academy of Engineering, Washington, D.C.

Hull Structure Committee—Norman Hammer, Assistant to the Director, Maritime Administration, Washington, D.C.

Hydrodynamics Committee—Prof. **Lawrence W. Ward**, profes-

sor of engineering, Webb Institute of Naval Architecture, Glen Cove, N.Y.

Marine Systems Committee — Capt. **William M. Nicholson,** USN (ret.), Associate Director, Office of Marine Technology, NOAA, Rockville, Md.

Ship Production Committee — **Ellsworth L. Peterson,** president, Peterson Builders, Inc., Sturgeon Bay, Wis.

Ship Technical Operations Committee — **Thomas J. Sartor Jr.,** vice president-Marine, Farrell Lines Incorporated, New York, N.Y.

Ships' Machinery Committee — **Robert P. Giblon,** president, George G. Sharp, Inc., New York, N.Y.

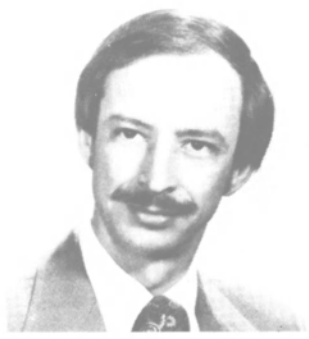
Keyes Offshore Asks Title XI For Two Rigs To Cost $64.1 Million

Keyes Offshore, Inc., 2425 Fountainview Drive, Houston, Texas, has applied for a Title XI guarantee to aid in financing the construction of two jackup drilling rigs. Designed to operate in water depths up to 250 feet, the units would be used in the Gulf of Mexico.

Ingalls Shipbuilding, Pascagoula, Miss., is the proposed builder, with deliveries scheduled for March and May 1981.

The total estimated actual cost of the two rigs is $64,142,000. The requested guarantee would be for $43,142,000.

J.M. Lewis Appointed VP Operations At International Paint



James M. Lewis

James M. Lewis has been appointed to the new position of vice president of operations of International Paint Company. The appointment was announced by **John P. Merrill Jr.,** executive vice president.

Mr. **Lewis** comes to International Paint after 10 years with the Coatings Division of Mobil Chemical Company. In his new position, Mr. **Lewis** has charge of all operating functions, and initially will be involved with improving the company's inventory management and production distribution systems. Mr. **Lewis** received his degree in chemical engineering from the University of Tennessee.

Compact 100-Watt SSB Offered By ITT Mackay —Literature Available

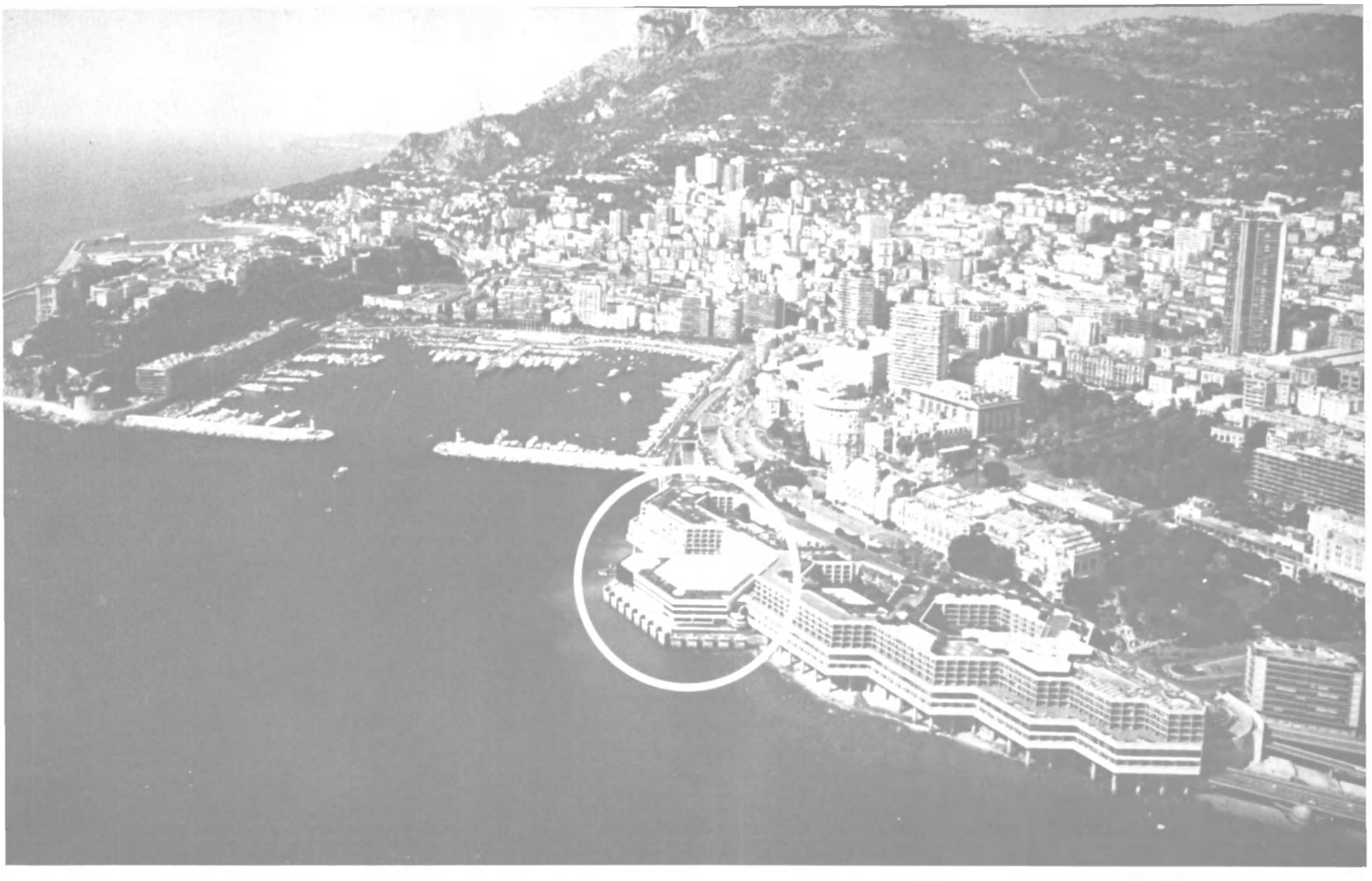
A new single-sideband radiotelephone designed for small commercial vessels, while meeting FCC requirements for use as a shore station, has been introduced by the ITT Mackay Marine Division of International Telephone and Telegraph Corporation.

Measuring less than 5 inches high, 14 inches wide, and 18 inches deep, the compact Mackay Marine 6100 is suited for use on vessels where space is critical and dependability and simplicity of operation are required.

The radiotelephone can be installed on any convenient flat surface, such as a tabletop, bulkhead, or overhead.

Operating features of the Mackay Marine 6100 include 100-watt PEP transmitter output, a 2 to 9 MHz frequency range, complete solid-state circuitry, field programmability, 24 frequency synthesized channels, and a choice of simplex or semi-duplex operation on all channels. It weighs 25 pounds.

For complete literature and specifications, write **Ed Engebretson,** ITT Mackay Marine Division, P.O. Box 25241, Raleigh, N.C. 27611.



The new convention center at Monte Carlo, where Ro-Ro '80 will be held.

The 4th International Conference And Exhibition

RO RO 80

The 4th International Conference and Exhibition on Roll-On/Roll-Off Transportation will be held from April 15-17, 1980 in Monte Carlo at the new Convention Centre. The Principality of Monaco is located midway between the French and Italian ro-ro ports of Marseilles-Fos and Genoa.

The Ro-Ro '80 meeting will provide an integration of Conference and Exhibition in the same manner as the previous gatherings—Ro-Ro '76 and Ro-Ro '77, held in London, England, and Ro-Ro '78, held in Hamburg, West Germany. Each of these conferences attracted more than 700 participants from the international community—shipowners, port operators, equipment suppliers, engineers, naval architects and others interested in this form of transportation. Ro-Ro '80 is expected to be even more successful. More than 40 international companies will be exhibiting the latest ro-ro technologies and services during the three days of the Conference.

For centuries man has used the roll-on/roll-off method of transporting wheeled vehicles across bodies of water. Originally rafts were used to move wagons and carts across rivers and enclosed bodies of water. As mankind progressed, local economies became national and national economies became worldwide, requiring increased water transportation. However, the roll-on/roll-off concept remained localized in the form of ferryboats, carfloats, etc. Economics indicated that the space consumed by the undercarriage of wheeled vehicles was not conducive to efficient use of ship cargo space. This concept held true when manufactured goods were being moved between industrialized countries. The world of trade has changed in the past 30-40 years and thus the roll-on/roll-off ship was developed to meet changing needs. The first major use of roll-on/roll-off ships was between the Scandinavian countries. These were basically glorified ferryboats. Now, such ships are a major factor in international trade.

Ro-Ro '80 will reflect the current concern for profitable and full employment of the new tonnage being built. The Conference in its ship operations and design sessions will emphasize a further factor — ship utilization — focus-

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RO/RO—80

(continued from page 38)

ing on possible new routes and trades.

The Conference will have five technical sessions, starting with Session 1 on April 15 dealing with Ro-Ro Operations and Trades. Speakers will develop the potential of the ro-ro vessels as a multipurpose carrier in general cargo trades between developed and lesser developed countries. The speakers will include **Bjorn Ervell**, a member of the Johansson Group management board, Sweden; **Gordon C. Miller**, vice president, Transamerica Realco Inc., Chicago, Ill.; **Rune Svensson**, transport director, AB Volvo, Sweden; **Peter S. Shaerf**, director, Common Brothers USA Ltd., New York, N.Y., and **Pekka Kandelin**, naval architect, Oy Wartsila, Finland.

Session 2 and Session 3 will be held consecutively during the morning of April 16. Session 2 will feature a paper by **George Spalatin**, naval architect, Inkobrod, Zagreb, Yugoslavia, dealing with seaborne rail transportation, and the planning of a ro-ro fleet for developing countries. Session 3 will deal with ship stability and SOLAS requirements. A paper prepared jointly by **P. Fagerlund**, technical director, Transatlantic Rederi A/B, Gothenburg; **P. Damkjaer-Nielsen**, naval architect, East Asiatic Co., Copenhagen, and **B. Berg**, assistant manager, Wilh. Wilhelmsen, Oslo, will deal with ro-ro damaged stability. Some notes on coping with the regulations and IMCO recommendations will be given by **Martin A.W.M. van Hees**, naval architect, Rhine-Schelde-Verolme, Netherlands, and **Patrick G. Martin**, naval architect, Verolme Cork Dockyard Ltd. (RSV Group), Ireland. Firefighting and water clearance on trailer decks will be discussed by **E.J.B. Pawsey**, director, Hart Fenton & Co. Ltd., consultant naval architects to the Sea Containers Group of Companies, London. **E. Vossnack**, chief naval architect, Nedlloyd Fleet Services, will contribute to this session.

Session 4, to be held in the afternoon of April 16, will deal with Mediterranean ro-ro operations. Speaking on the commercial and ecnomic aspects of these operations will be Capt. **Oktay Sonmez**, commercial director, DB Turkish Cargo Lines, Istanbul. A panel consisting of Dr. **Fabrizio Serena**, director general, Italia Navigazione SpA, Genoa; **J.P. Isoard**, managing director, SNCM (Societe Maritime Corse Mediterranee), Marseilles; Comm. **Spiro Magliveras**, managing director, Traghetti del Mediterraneo, Genoa, and **Eugenio Belloni**, director, Andrea Merzario SpA, Milan, will take part in this session.

On April 17, at the start of Session 5, a film will be shown on the operation of self-sustaining container ro-ro vessels. **Nigel J. Tatham**, director, Sea Containers Services Ltd., London, will introduce this film. The rest of Session 5 will deal with ports and terminals. **Geoffrey A. Stokoe**, managing director, MacGregor Ports and Terminals Ltd., London, will offer solutions to the ro-ro access problems. The instigator of the portable linkspan, **John Rose**, managing director, Marine Development (Glasgow) Ltd., UK, will talk about simple systems to be applied to the totally committed container port whose present economics he questions. **Douglas Ross**, president, CTEC Company, Bellevue, Wash., will present a paper on the application of articulated steering on terminal tractors. Aligning ro-ro equipment to handle specialized bulk and unitized loads will be discussed by **Warren S. Lister**, terminal handling consultant, managing director, Listavia Ltd., UK. The concluding paper will be presented by **S.D. Barber** and **J. Knapton**, Department of Civil Engineering, University of Newcastle upon Tyne, UK, on the pavement design for ro-ro port areas.

The social activities will include a reception to the delegates by the Principality of Monaco in the evening of April 15. A second reception for the delegates will be held on April 16.

The focus of the Ro-Ro '80 Conference will be truly international

(continued on page 43)

RAYCAS.
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The world's finest Collision Avoidance system is also the most economical.

Will you collide? RAYCAS (Raytheon Collision Avoidance System) provides the answer in seconds, and helps you select the best evasive action.

RAYCAS combines a compact computer module with a Mariners Pathfinder® 16-inch Bright Display radar. This provides three unique installation options:

1. add only the RAYCAS module to an existing Raytheon 16-inch Bright Display radar;
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The Raytheon Bright Display presentation helps make RAYCAS the most effective Collision Avoidance System in the world.

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RAYCAS uses basic radar system video as input for the computer. The computer-generated collision avoidance symbols are then electronically superimposed directly on the Bright Display radar picture. As a result, observers can use familiar radar procedures assisted by target vectors, points of potential collision and other anti-collision data.

RAYCAS features.

- *Relative-motion Display:* Centered or 70% off-centered with course-up or north-up.
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- *Target Acquisition:* Manual or automatic with fixed and adjustable guard zones.
- *Tracked Targets:* Up to the 20 most dangerous targets.
- *Target Vectors:* Indicate true or relative courses and speeds; adjustable time base helps predict future position.
- *Target Trails:* Indicate target's past position and course.
- *Dangerous Targets:* Automatically selected by pre-set CPA (Closest Point of Approach) and TCPA (Time to CPA).
- *Points of Potential Collision:* Automatically displayed.
- *Digitally Displayed Data:* CPA and TCPA; own ship's speed and course; target's range, bearing, speed, and true course; own vector length; vector time; BCR (Bow Crossing Range) and BCT (Bow Crossing Time).
- *Trial Maneuver:* Scope displays results of own ship's trial course and speed changes.
- *Visual and Audible Warnings:* Dangerous target, target in guard zone, equipment fault, trial maneuver, and target lost.
- *Automatic Drift Correction:* Computed by tracking on fixed navigation aid.
- *Navigation Lines:* Scope presentation of 8 lines for fairways.
- *Brightness Controls:* Separate adjustments for radar and computer video.
- *Performance Monitor:* Manual or automatic monitoring of radar performance.

Two-year warranty.

The American made RAYCAS, like the more than 5000 Raytheon Dual 3 and 10-cm Radars now in service, is already a proven performer. Installations have been made on all types of vessels from coastal ships to VLCC'S.

RAYCAS has a two year limited parts warranty. On board service is free for one year within a fifty-mile radius of any of our U.S. Dealers and worldwide service network in major ports everywhere.

For more detailed information contact the Raytheon Marine Company office nearest you.

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Telex: 94-34-59

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Telex: 31473 RAYCO DK

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3-12-1, Kaigan-Dori
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Telephone: (045) 212-3633

Raytheon Marine And Service Company
Millard House
5 Exchange Building
Cutler Street
London E1
Telephone: 01-623-4451/2
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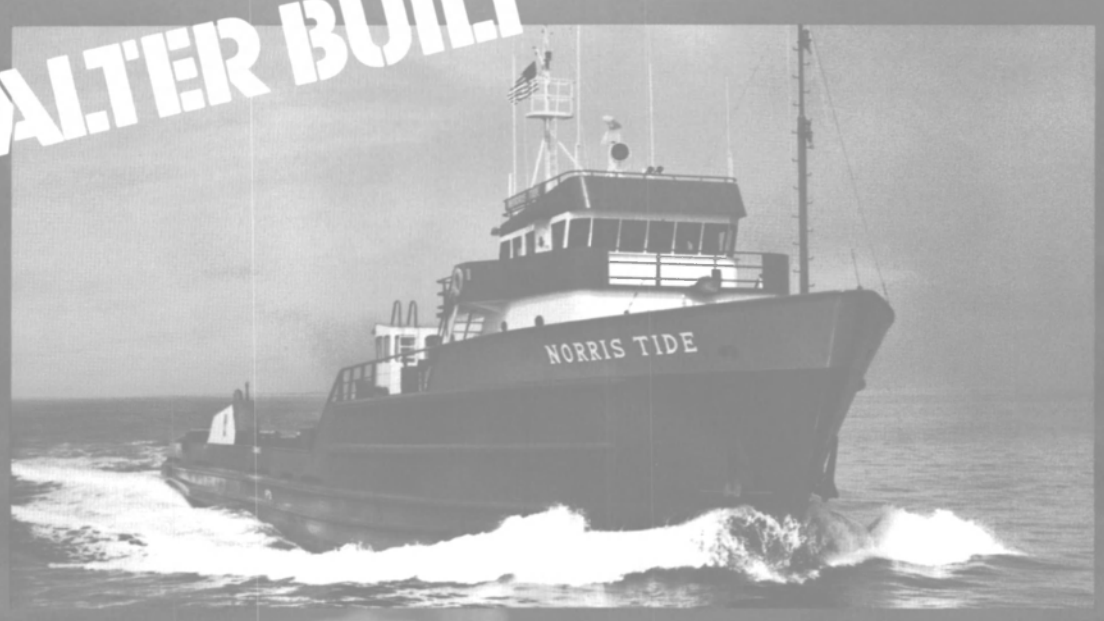


Halter Marine builds more supply vessels than anybody else in the world.

Because we build them better than anybody else. We build for some of the world's largest fleet operators and some of the smallest. In 1979 six of our ten shipyards delivered 52 supply boats alone.

Halter-built supply vessels are at work throughout the world in all sea conditions providing every kind of support the offshore oil and gas industry demands.

Whether you need a vessel to carry drilling muds, acids, drill pipe, position anchors, tow rigs, or whatever-we can build it for you. You can choose from stock designs from 110 feet to 217 feet with conventional or diesel electric power or, our in-house marine engineers and naval architects can design a vessel to suit special requirements.

And we don't stop there. Our interior design group provides interiors that keep crews comfortable in a home-like atmosphere for increased morale and efficiency.

We can build any boat you need. Ask us. Halter Marine, Inc., Dept. A-4, Box 29266 New Orleans, LA 70189 U.S.A., (504) 246-8900, Telex —58-4200, Cable HALMAR

HALTER MARINE INC.

The Total Shipbuilding Group

RO/RO—80

(continued from page 40)

—looking at many of the main traffic areas where new thinking and innovative use of the ro-ro mode have been applied. These range from the home waters of the venue, the Mediterranean, to as far afield as the Caribbean and other new ro-ro routes to developing countries.

Although ro-ro ship design has progressed considerably from the first North Sea applications, there are some major design problems still to be solved, especially in the light of ever increasing ship costs. These and some new systems will be debated at the meetings.

From the port viewpoint the progress in ro-ro berth design has been equally dramatic, but often costly where ports have specified rashly in both equipment and systems which have been incompatible with existing infra-structure and future planned developments. Previous Ro-Ro Conferences have brought the state-of-the-art forward a step and Ro-Ro '80 will be no exception.

In addition to the Conference and Exhibition, there also will be technical tours to ro-ro facilities and ships.

RO-RO 80
Exhibitor List*

Werft Nobiskrug	West Germany
International Lashing Systems	UK
Lancer Boss	UK
Spanset	UK
Volvo Penta	Sweden
Schichau Unterweser	West Germany
Ottawa Truck Division	UK
DAF Special Products	Netherlands
Velle System	West Germany
Mafi Transport Systeme	West Germany
Intering GmbH	West Germany
MacGregor International Organisation	UK
Peck & Hale (GB) Ltd.	UK
North Western Trailer Co.	UK
Svenska Flaktfabriken	Sweden
Valmet Oy	Finland
Hyster Europe	UK
Rolling Transport Systems	UK
Lansing Henley	UK
Wartsila Turku Shipyard	Finland
Conver Ingenieurtechnik	West Germany
Container Safe	Sweden
Mattsson Group	Sweden
Port Autonome de Marseilles	France
Plan Transport Equipment	Switzerland
Seasafe	Norway
F.L. Douglas Equipment	UK
Kalmar LMV	Sweden
Navire Cargo Gear Int.	Sweden
Inter Equipos Navales	Spain
Gotaverken Arendal	Sweden
Johansson Group	Sweden
Oskarhamns Shipyard	
Port of Wallhamn	
Roto Line	
Infis AB	Sweden
Thos. Storey (Engineers)	UK
A Jaernkonstruktioner	Sweden
Cargospeed Equipment	UK
Orsa Katting	Sweden
Mariterm	Sweden
Marine Development (Glasgow) Ltd.	UK
Ron Moore	UK
Kvaerner Brug	Norway
Suomen Autoteollisuus	Finland
Adriatica di Navigazione SpA Venice	UK
Clark Equipment Ind. Truck Division	West Germany
Kockums	Sweden
Consorzio Autonome del Porto Napoli	Italy
OT Africa Line	UK

*As available at press time.

Kawasaki Receives Order For $20.3-Million Floating Drydock

Kawasaki Heavy Industries, Ltd., has received an order from the Sembawang Shipyard of Singapore for a $20.3-million floating drydock.

The contract, which includes installation expense, calls for construction of the dock to begin in July, with completion scheduled for March next year. The drydock is to be towed to Singapore and delivered by May 1981.

An announcement by Kawasaki said the dock will be 290 meters long, 63 meters wide and 20 meters high (about 951 feet by 207 feet by 66 feet). The dock is to be capable of handling ships of up to 150,000 deadweight tons.

Theron C. Foote Appointed VP At Waterman Steamship

James Devine, vice president-sales and marketing for Waterman Steamship Corp., New York, N.Y., has recently announced the appointment of **Theron C. Foote** as vice president-pricing.

Mr. **Foote** was previously with Atlantic Container Line.

Halter Marine Delivers Supply Boat 'Tara Alyene' To Briley Marine

Halter Marine, Inc., New Orleans, La., has delivered the Tara Alyene, a new supply boat, to her owners, Briley Marine of Lafayette, La.

The new vessel, built with the cooperation of Stewart & Stevenson Services, Inc., is 180 feet long, with a 38-foot beam and 14-foot draft. She can carry 3,600 cubic feet of mud in her four bulk mud tanks and 1,700 barrels of liquid mud in four liquid mud tanks.

The Tara Alyene has a speed of approximately 12 knots, and is driven by two GM16V149NA engines developing 900 hp each at 1,800 rpm. She swings two stainless steel 74-inch four-bladed propellers turning through Twin Disc 540 reverse/reduction gears with a ratio of 6:1. Her station-keeping capability alongside offshore platforms is enhanced by a Murray Tregurtha 400 bowthruster driven by a GM8V71, 375-hp diesel engine.

Two 900-hp GM engines and a Murray & Tregurtha bowthruster enhance the Tara Alyene's station-keeping capability.

Two GM8V71, 125-kw generator sets provide electric power for auxiliary services. Bilge, ballast, and fuel transfer pumps are Aurora model 344; freshwater and sanitary water pressure sets are Barnes model 1400. The offship firefighting system is a Feecon DM 750 turret-mounted nozzle atop the pilothouse with a Berkley-type "C" pump driven by the bowthruster engine.

Some of the pilothouse electronics include Two Decca RM916A radars, an ITT Decca Marine STR-25 VHF/FM radiotelephone, a Simrad Loran C model LC123, and a Raytheon DE 726 depth sounder with a 7041 transducer.

She is outfitted with an HBL double wildcat anchor windlass working two 2,000-pound anchors with 1,800 feet of high-strength stud link chain.

The Tara Alyene is ABS classed A-1, Maltese Cross, AMS full ocean towing, U.S. Coast Guard Subchapter I, USCG NVC 1-78, and U.S. Public Health Approved. She was built at Halter's Moss Point (Miss.) Division, one of 10 shipyards owned and operated by the company in the Southeastern United States.

Halter is one of the world's largest builders of support vessels for the offshore oil and gas industry.

Brown & Root Announces Three Management Changes

Joseph G. Munisteri | William M. Rice | Thomas D. Murphy

Thomas J. Feehan, president and chief executive officer of Brown & Root, Inc., Houston, Texas, has announced three changes in the company's executive management. Brown & Root, one of the world's largest engineering-construction firms, is a Halliburton Company subsidiary.

Joseph G. Munisteri, group vice president, director, and member of the operating committee, has assumed responsibilities in corporate development and will report directly to the senior executive vice president, **W.B. Pieper.**

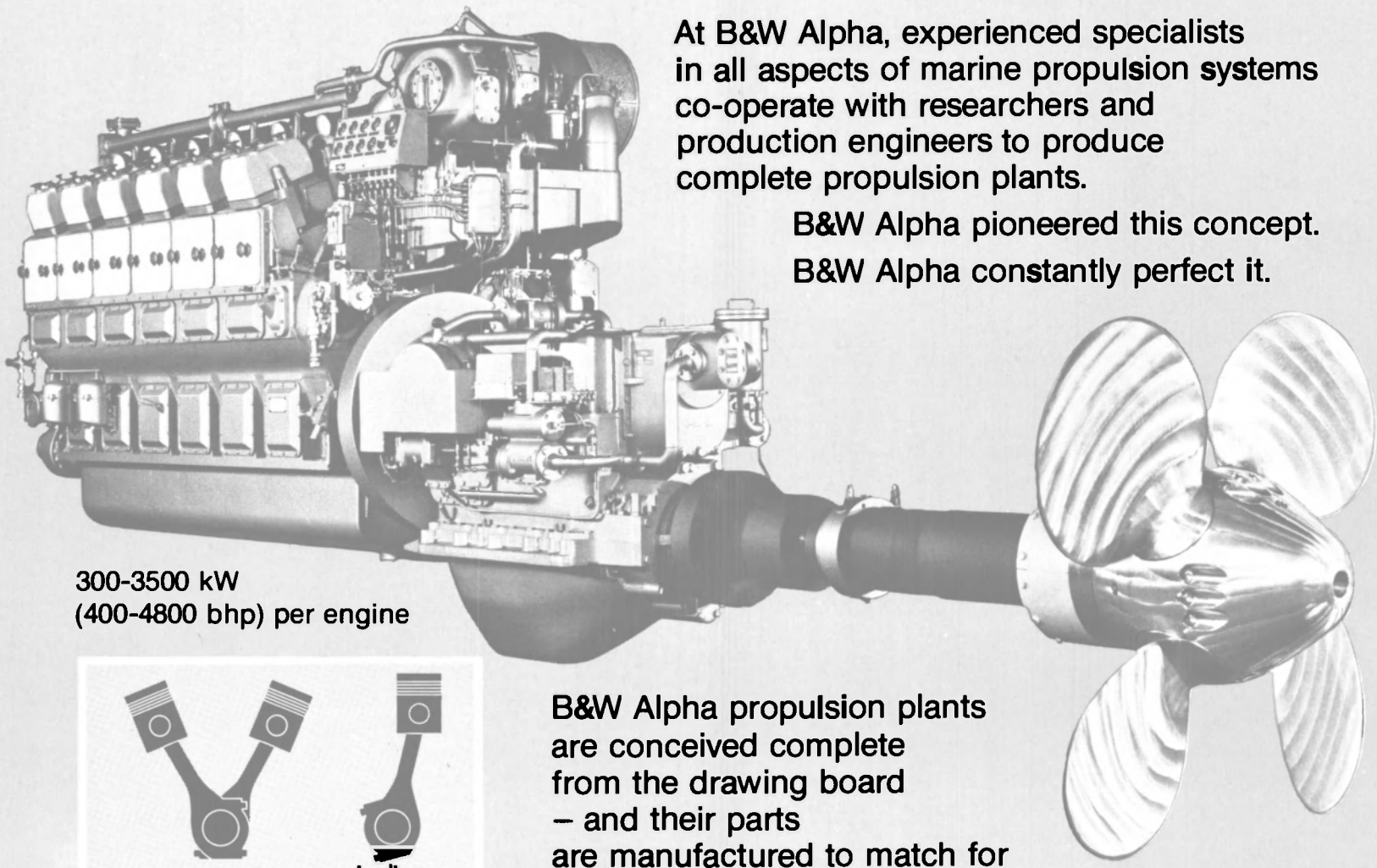
William M. Rice, group vice president, will be responsible for activities of the power group, and has been elected to the Brown & Root board of directors and the operating committee.

Thomas D. Murphy, vice president, assumes responsibility for management of the Western Hemisphere marine construction division's Greens Bayou and Harbor Island fabrication yards at Houston and Aransas Pass, Texas.

meet the experts under one roof

B&W Alpha

in marine diesel engines
transmission systems – propellers & nozzles
automatic control & monitoring



300-3500 kW
(400-4800 bhp) per engine

At B&W Alpha, experienced specialists in all aspects of marine propulsion systems co-operate with researchers and production engineers to produce complete propulsion plants.

B&W Alpha pioneered this concept.

B&W Alpha constantly perfect it.

B&W Alpha propulsion plants are conceived complete from the drawing board – and their parts are manufactured to match for harmonious, economical operation.

They are covered by a single warranty and, throughout their long service life, they are serviced by a single worldwide organisation.

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Post Oak Bank Building, Suite 620, 2200 S. Post Oak Road, Houston, Texas 77056 · Phone: (713) 960-1306 · Telex: 910 881-5005

American Hydromath Receives Contract For Cargo Planning Computers

American Hydromath Company, Germantown, N.Y., recently delivered three LOADOSCOPE Cargo Planning Computers to the American Heavy Lift Shipping Company, a division of Gulf Trading & Transportation Company; one each for the John Henry and Paul Bunyan, and one to be placed and used in the main office.

These vessels are capable of transporting and delivering cargoes having unit weights up to 1,000 tons to developed ports, and because of shallow draft, to remote and primitive areas.

LOADOSCOPE, a solid-state electronic special-purpose computer, automatically calculates and simultaneously displays draft fore and aft, GM required and available, including free surface and KG corrections, the angle of heel, deadweight, and the allowable bending stress or shear stress which a ship will have under any assumed load distribution. The selection of stress is made by positioning a toggle switch and of deadweight, ballast, fuel oil or cargo by keyboard switches. All three centers of gravity, the X, Y, and Z coordinates of the load are taken into account, as inputs. An alphanumeric printer gives the operator a hard copy of all inputs and outputs. LOADOSCOPE acts as a situation display board.

For free literature describing LOADOSCOPE Loading Computers, write **Robert M. Kristal**, American Hydromath Company, Box 299, Buckwheat Bridge Road, Germantown, N.Y. 12526.

Atlantic Container Line Opens Baltimore Office

Atlantic Container Line has opened a full-service office in Baltimore, Md., it was recently announced by **O.I.M. Porton,** president.

The new office occupies 4,100 square feet at 5 Light Street.

Staffing the new office are **Thomas W. Wojcio,** traffic manager; **Richard Amato,** documentation manager; and **Jeffrey J. Chokov,** booking and equipment control manager.

It was also announced that Motorships Inc., ACL's agent for handling car shipments between Europe and the United States, will open its own office at Baltimore's Dundalk Marine Terminal.

Port Houston Marine Offers Services And Facilities Brochure

A full-color brochure is available describing the facilities and services of Port Houston Marine, Inc., Houston, Texas.

Port Houston Marine, Inc. is located at the turning basin of Houston Ship Channel, and has a berth for vessels up to 600 feet long and 20-foot draft. Compressed air, water and electric power supplies are provided. Workshops totaling 25,000 square feet are available, equipped with overhead cranes, welding equipment, plate roller and a wide range of machine tools. Around-the-clock service is offered for both scheduled and emergency repairs; the company carries out all types of repair, including diesel engine repairs. Tank cleaning is also offered.

Port Houston Marine, Inc. was recently acquired by the Aker Group of Norway. Following the acquisition, Aker appointed **Bjorn A. Henriksen** president of the company. Prior to his appointment in Houston, Mr. **Henriksen** was manager of the Oslo office of Bergens Mek Verksted, another Aker Group company well-known for its Bergen diesel engines and Norwich hydraulic winches. Port Houston Marine, Inc. is now undertaking full service of these products.

For a copy of the brochure, write **Bjorn A. Henriksen,** Port Houston Marine, Inc., P.O. Box 5445, Houston, Texas 77012.

FIRST AGAIN.
Woolsey Marine introduces

FIRE RETARDANT COATINGS.

The only Marine Paints that live up to their name.

Built to take it.

With over 126 years of leadership in protective marine coatings technology, it should come as no surprise that Woolsey Marine introduce the "First" marine, intumescent fire-retardant coatings.

These unique, protective coatings can minimize risk onboard in areas where a potential fire hazard exists: galley, engine compartment, bilge, etc.

In case of fire, materials coated with Woolsey Fire-Retardant Coatings are less likely to ignite.

By reducing the spread of flames along a painted surface, these coatings can minimize property damage and provide that extra margin of safety for those onboard to affect an escape.

When properly applied, Woolsey Fire-Retardant Coatings can minimize fire loss and save lives.

A Unique Protective Foam Barrier.
With exposure to heat and open flames, a surface coated with a Woolsey Fire-Retardant Coating System will "intumesce"—swell into a layer of protective and insulative foam hundreds of times the thickness of the original paint film.

This protective foam shield expands rapidly to delay contact with the underlayment while impeding flamespread and smoke build-up.

If the fire hasn't been too extensive or burned too long, the substrate may still be serviceable. In many instances, the dry, charred foam can be scraped off and the surface repainted.

A Full Range of Colors and Finishes.
Like all Woolsey protective coating systems, these new, fire-retardant coatings come in a select range of colors and finishes to match your particular needs. Available in varnish and latex base.

Make Woolsey's new Fire-Retardant Coatings your first line of defense. The only marine paint that can handle a hot situation.

For further information, call or write us directly.

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"I'll meet you in any port with any or all of these services."

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Services are tailored to specific turnaround schedules, and backed by GE's worldwide manufacturing and repair facilities. They range from appraisals/inspections that pinpoint maintenance needs, to responsibility for a total program . . . including the complete supply of labor, job management, tools and equipment, parts procurement, and machine shop services. Contact the GE Marine Superintendent nearest you, or write:

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- Voyage Repairs/Emergency Repairs
- Surveys/Overhauls
- Modifications/Retrofits/Upgrades
- Complete Maintenance

Technical Training Programs

EQUIPMENT AND SYSTEMS

Electrical & Electronic
- Automated propulsion controls
- Central Operating Systems (COS)
- Cranes-shipboard & dockside
- Winches
- Diesel engines/diesel generators
- AC and DC motors and controls
- Shipboard power distribution

Mechanical
- Steam turbine & gear propulsion
- Ship's service turbine-generators
- Gas turbines
- Distillation units
- Pumps and Compressors
- Condensers
- Fans

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The only Marine Paints that live up to their name.

Built to take it.

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"I'll meet you in any port with any or all of these services."

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GENERAL ELECTRIC'S FULL RANGE OF MARINE SERVICES

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Maintenance
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- Troubleshooting
- Voyage Repairs/Emergency Repairs
- Surveys/Overhauls
- Modifications/Retrofits/Upgrades
- Complete Maintenance

Technical Training Programs

EQUIPMENT AND SYSTEMS

Electrical & Electronic
- Automated propulsion controls
- Central Operating Systems (COS)
- Cranes-shipboard & dockside
- Winches
- Diesel engines/diesel generators
- AC and DC motors and controls
- Shipboard power distribution

Mechanical
- Steam turbine & gear propulsion
- Ship's service turbine-generators
- Gas turbines
- Distillation units
- Pumps and Compressors
- Condensers
- Fans

SERVICE ANYTIME... ANYWHERE

Installation & Service Engineering Division

GENERAL ELECTRIC

Submarine Tender McKee (AS-41) Launched At Lockheed-Seattle

The 23,000-ton submarine tender McKee, last of three of the 644-foot auxiliary ships Lockheed Shipbuilding is constructing for the U.S. Navy, was recently launched at Seattle, Wash.

Mrs. Ingeborg von Finckh McKee, widow of Rear Adm. **Andrew Irwin McKee,** christened the ship before it slid down Lockheed's shipway on Harbor Island into the West Waterway of the Duwamish.

Tugs immediately moved in to tow the ship to Lockheed's Yard 2, in West Seattle, for outfitting. The McKee, expected to be delivered to the U.S. Navy in the summer of 1981, will join sisterships Emory S. Land (AS-39) and Frank Cable (AS-40), which were delivered in 1979.

Keel-laying ceremonies for the McKee followed the January 14, 1978, launch of the Frank Cable. The name of the ship honors Rear Adm. **Andrew Irwin McKee,** pioneer of modern submarine design and development.

Congressman **Joel Pritchard** was the principal speaker in the launch ceremonies that preceded the christening of the McKee. The matron of honor for the christening program was **Mrs. Jane Fryer,** sister of Admiral **McKee.**

Flower girl for the ceremony was **Miss Cacey Zimmer,** daughter of **C.M. Zimmer,** submarine tender welding superintendent.

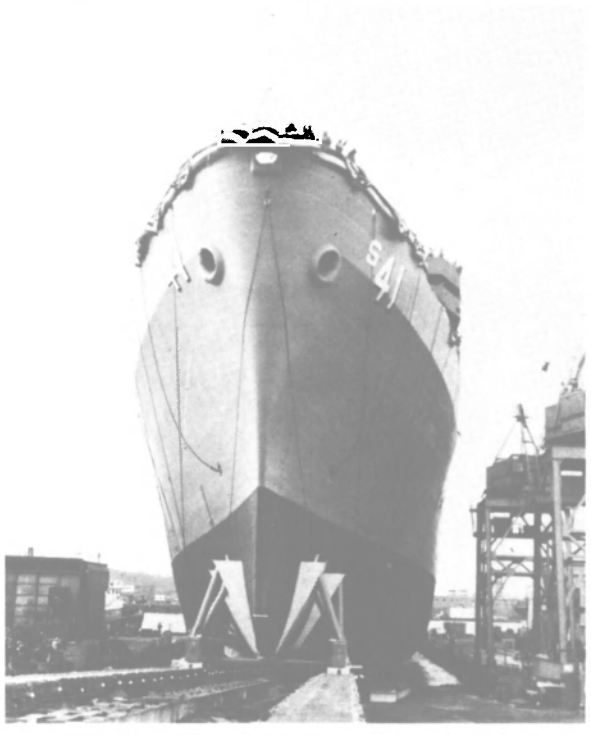
G. Graham Whipple, Group vice president-Lockheed Corporation, served as master of ceremonies, while **Roy A. Anderson,** chairman of the board of directors, Lockheed Corporation, introduced the principal speaker.

Stanley E. Jensen, general vice president, International Association of Machinists and Aerospace Workers, represented labor in the ceremonies. Rear Adm. **F.F. Manganaro,** Vice Commander, Naval Sea Systems Command, also addressed the crowd of employees, Navy people, and others that gathered for the ceremonies.

The 13th Naval District Color Guard Band provided music. The Naval Reserve Officers Training Corps, University of Washington, supplied the color guard. Capt. **Oliver Wetzel,** Chaplain, 13th Naval District, gave the invocation. Instructions to the sponsor were handled by Capt. **S.P. Passantino,** supervisor of shipbuilding, Seattle, and **John N. Watt,** director of marketing, Lockheed Shipbuilding.

The three submarine tenders rank among the largest Naval ships to be built in the Northwest. Together, the three ships represent approximately a half billion dollars in shipbuilding contracts. Some 2,000 persons presently work at the Lockheed yards. While the company carries on active ship overhauls, repairs, and commercial steel businesses, the submarine tender work has represented the bulk of the company's activities.

Before the launching ceremonies, sponsor's party posed with their ship, left to right: sponsor **Mrs. Ingeborg von Finckh McKee,** flower girl **Cacey Zimmer,** and matron of honor **Mrs. Jane Fryer.**



Following the christening, the submarine tender McKee (AS-41) slides down Lockheed Shipbuilding and Construction Company's shipway on Harbor Island and enters the West Waterway of the Duwamish.

Martin Marietta To Build $17.5-Million Alumina Transfer Facility

Martin Marietta Aluminum has announced plans to spend $17.5 million to replace its existing alumina transfer facilities in Portland, Ore., with a larger and more efficient installation. The new facilities will be constructed at the same location on the Willamette River.

The site, known as Albina, is approximately eight acres, comprising a strip of land 1,600 feet long and 200 feet wide. It is served by a 40-foot ship channel, and has access to rail transportation. The existing equipment will continue to be used until the new project is completed.

Since 1958, Martin Marietta has used this site to transfer from ships to railcars the alumina required to operate its aluminum reduction plants at The Dalles, Ore., and Goldendale, Wash.

Swan Wooster Engineering Inc. will be responsible for engineering, design, procurement, and construction management of the project.

J.M. Donnelly Elected AWO Board Chairman

John M. Donnelly Jr., president of Ingram Barge Company, Nashville, Tenn., was elected chairman of the board of The American Waterways Operators, Inc., at the Association's annual board of directors meeting in Houston, Texas.

AWO is the national trade association of the barge and towing industry—inland and coastwise—and the shipyards engaged in the construction and repair of the fleet.

Mr. **Donnelly**, who has served as vice chairman of AWO for the last year, succeeds **William A. Creelman**, president of the Transport Division of National Marine Service, Inc., St. Louis, Mo. Mr. **Donnelly**'s previous AWO work has included the chairmanship of the Association's Region 3 and a number of committee assignments.

"Ever-increasing regulatory pressures from a variety of government sources, combined with unprecedented demand for surface transportation services, will put transportation productivity to an unparalleled test in the 1980s," Mr. **Donnelly** said. "Transportation equipment and technology will be called upon as never before to respond with efficiency and imagination.

"Despite these conditions, I can assure you that the barge and towing industry—with its inherent advantages of fuel efficiency, energy efficiency and cost efficiency—will continue to meet the country's industrial and agricultural shipping needs.

"The barge and towing industry has long demonstrated its ability to equal the challenge. I look forward to taking part in the leadership of the American Waterways Operators as our role in the country's distribution system is redefined."

John M. Donnelly Jr.

Mr. **Donnelly** joined Ingram Oil and Refining Co. (predecessor company of Ingram Industries) in 1955, and became active in the barge business in 1963. He has served as a board member of several waterway-oriented groups, and was a founding board member, and later chairman of the board, of the National River Academy in Helena, Ark.

He graduated from Vanderbilt University, where he now serves as a member of the executive committee and board of directors of the Alumni Association.

Contract Awarded For Oil Loading Column With Concrete Shaft And Base

A contract has been awarded by Phillips Petroleum Exploration U.K., Ltd. to Equipments Mecaniques et Hydrauliques (E.M.H.) for the design, supply and installation of an articulated loading column (ALC) for offshore tanker mooring and crude oil loading in the Maureen Field of the North Sea.

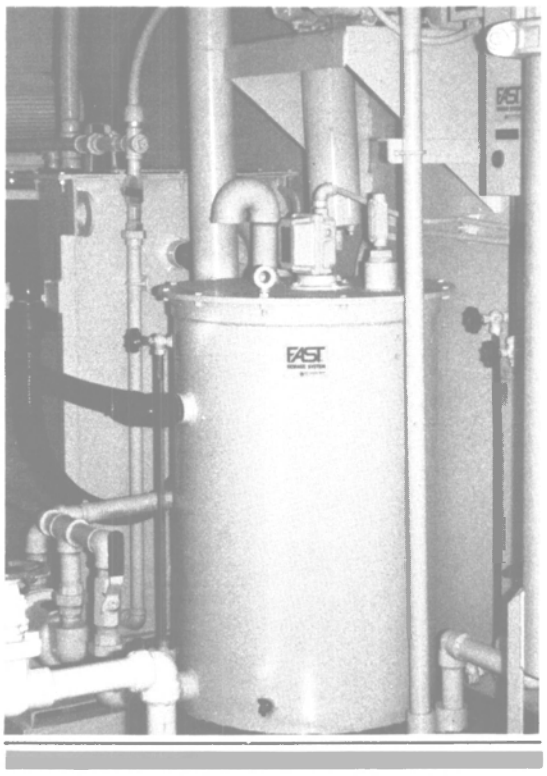
The ALC design features, as a world first, a pre-stressed concrete shaft and a concrete gravity base. E.M.H. has subcontracted the fabrication to Howard Doris Ltd., with the detailed concrete design being performed by **C.G. Doris**.

The ALC is scheduled for installation in 1981 in 95.6 meters of water (about 314 feet), and has been designed to load 85,000-dwt tankers at 20,000 bbls/hour in waves up to 10 meters (about 33 feet).

E.M.H., a Paris, France-based marine structures company, is the originator of the articulated column design. The Maureen column will be their fifth such structure in the North Sea.

Clean
Simple
Odorless
Clogproof
Minimum Maintenance
and
It Works.

FAST Marine Sewage Systems are built exclusively by St. Louis Ship, America's Largest Inland Shipbuilding and Repair Firm. FAST® stands for Fixed Activated Sludge Treatment, which is a patented biological process for removing impurities from sewage as required by law. FAST Systems are certified by the U.S. Coast Guard as Type II flow-through devices. They also meet U.S. Public Health Service and A.B.S. Requirements, and all known or anticipated marine standards worldwide. This unique system is extremely reliable and consistent in operation. It has been proven by continuous marine service since 1970. It cannot be clogged and operates without foul odors. Simple but



rugged in design, there are no adjustments. It operates with minimum maintenance, low operating costs and produces superior effluent quality. Available three ways: modular, completely assembled or built into vessel tankage. Accommodates 3 to 3000 persons. The FAST System is also convertible to Type III No Discharge operation if desired.

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Write or call today for your copy of "What Management Needs to Know About Marine Sewage Systems, & Compliance with U.S. Coast Guard Regulations." Telephone (314) 638-4000. Telex 44-7224 ST L SHIP STL.

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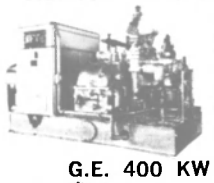
TURBO GENERATOR SETS

G.E. 1500 KW A.C. TURBO GENERATORS

1 

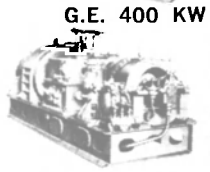
1500 KW — 450/3/1200 RPM —0.8 P.F.—2450 amps—525 PSI—850°TT—8145 RPM—11-stage geared 8145/1200—type FN4 — 3½" steam inlet. Unit will deliver full power at 440 lbs & 760°TT. OAL 16' 3-3/8"—OAW 6'6"—OAH 7'5¼"—wt. 36000 lbs. Almost equal to new. Very little use. With ABS or Lloyds.

G.E. 600 KW GEARED TURBO GENERATORS

2 

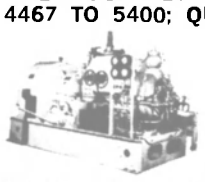
450/3/60/1200 RPM — 961 amps — type ATI — 0.8 PF. TURBINE: FSN-FN-20 6-stage—525 lbs/825°F — superheat 355°/371°F. GEAR: 10033/1200 — RPM 10033 — total — 6390 lbs. steam/hr. steam flow.

G.E. 400 KW TURBO GENERATORS

3 

450/3/60/1200—0.8 PF—641 amps. TURBINE: 6-stage — 10059 RPM—525 lbs/825°TT — type GE 618N. Steam rate 5100 lbs/hr. — OAL 10' 10½" — OAW 4' 10½" — OAH 5' 5¼" — wt. 14,855 lbs.

400 KW WESTINGHOUSE TURBO GENERATOR SETS FOR BETH-SPARROWS POINT HULLS 4467 TO 5400; QUINCY HULLS 1600 SERIES

4 

400 KW (500 KVA) — 0.8 PF — 1200 RPM — 450/3/60. TURBINE: 585 lbs — 840°TT — 28½" vacuum — 9018 RPM — serial 10A4462-3 & 10A4462-4. GEAR: 9018/1200 RPM. A.C. GENERATOR: 500 KVA — 400 KW — 450 volts — 641 amps — 0.8 PF — 3-phase 60-cycle — 1200 RPM — CR 40° — excitation amps 41 — excitation voltage 120. Instruction book 5442. Switchgear available.

UNUSED WESTINGHOUSE 60 KW 120 VDC M-20-EH

5 

120 VDC — 1800 RPM. TURBINE: M-20-EH — 20 lbs dry & saturated — 25" vacuum. 7283 RPM. GEAR: 7283/1800. GENERATOR: 60 KW — 120 VDC — 500 amps — SK — stab. shunt wound.

UNUSED 500 KW DELAVAL-WESTINGHOUSE GEARED TURBO GENERATOR

6 

GENERATOR: Westinghouse 500 KW — 120/240 volts DC — 2080 amps — 1200 RPM — stab. shunt. TURBINE: DeLaval — 730 HP — 440 PSI working pressure condensing. Temperature 740° — 9977 RPM. HELICAL GEAR: 9977/1200 RPM. Serial # of turbine 245204 — weight 22,000 lbs.

TURBINES & ROTORS

BETH-SPARROWS POINT, QUINCY HULLS

7
1 HP Turbine or rotor — Bethlehem
1 400 KW Stator only — Westinghouse
1 HP turbine casing only — Bethlehem
1 Complete Westinghouse 400 KW turbo generator set
1 Forced draft motor fan
1 Anchor windlass — 2 11/16"
Steering gear motors — 15 HP
Forced draft fan impeller

WESTINGHOUSE C-25 CARGO PUMP TURBINE ROTOR

VICTORY-AP2 MAIN PROPULSION

8 Westinghouse AP2 19-stage HP rotor for 6000 HP Victory — serial #4A-2079 — equal to new.
Unused surplus AP2 — Victory Ship complete HP & LP turbines
Aliis-Chalmers HP & LP
Westinghouse LP AP2 with throttle valve
G.E. HP & LP with throttle valve

VICTORY-AP3 MAIN PROPULSION NEW 8500 HP G.E. TURBINES

9 Large Victory or C-3
HP #72271 LP #72272
10 Boxes spare parts, tools & fittings. With maneuvering valves.

8500 HP G.E. — C-3 OR VICTORY

10 H.P. — 8-stage — 6159 RPM — serial 62043
L.P. — 8-stage — 3509 RPM — serial 62042
G.E.I. 16263

VICTORY SHIP AUXILIARY TURBO GENERATOR SET ROTORS

11 300 KW 5965 RPM JOSHUA HENDY

Turbine — 3H-69	Gear — 52269
Turbine — 3H-52	Gear — 52252
Turbine — 3H-62	Gear — 52262

ALSO WESTINGHOUSE 2A & 5A SERIES

— FOR T-2 VESSELS —

12 

TURBINE: DORV-325M — 525 KW — 5645 RPM — 435 PSIG — 28" exhaust. REDUCTION GEAR: S-162 — form D — 5641/1200. A.C. GENERATOR: 500 KVA — 400 KW — 440/3/60 — 1200 RPM — 0.8 PF. D.C. EXCITATION GENERATORS: 75/55 KW — form AL — 110 volts DC. With new type amplydines.

538 KW WESTINGHOUSE T-2 AUXILIARY GENERATOR — COMPLETE

13 TURBINE: 538 KW @ 5010 RPM — 438 PSIG — 750°TT — 28½" vacuum. GEAR: 5010/1200 RPM. A.C. GENERATOR: 400 KW — 450/3/60/1200 — 0.8 PF. DC EXCITER: 32.5 KW — 120 volts (variable voltage) — shunt — 4-pole — DC excitation 5 KW. ALWAYS WELL MAINTAINED BY MAJOR OIL CO.

T-2 UNUSED G.E. MAIN PROPULSION STEAM TURBINE WITH ROTOR

14 10-Stage — 435# — 720°TT — turbine complete with rotor — serial #109166 — 4925/5400 KW — 3600/3720 RPM — 28.5" vacuum.

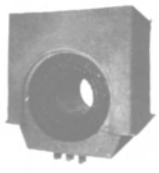
WESTINGHOUSE MAIN PROPULSION STEAM TURBINE WITH ROTOR EX-CHEVRON VESSEL "MACGAREGILL"

15 Shrouded—like-new condition. Will sell rotor separately.

WESTINGHOUSE MAIN PROPULSION TURBINE

Ex"Pecos" — unshrouded — serial 2A-7733-2 type A

UNUSED G.E. MAIN PROPULSION STATOR

16 

Type ATB-2—serial #6978272. 2300/2370 volts — 60/62 cycles — 3-phase — 3600/3720 RPM — armature amps 1237/1315 — 4925/5400 KW — 1.0 PF.
Westinghouse stator — from Ex "Pecos"

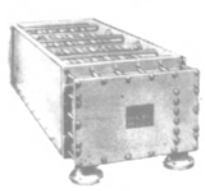
WESTINGHOUSE 538 KW AUX. GENERATOR EXCITER ARMATURE

17 

We have both types:
110 KW — 32 KW — 5.5 KW
110 KW — 28 KW — 5.5 KW

18 **538 KW WESTINGHOUSE AUXILIARY TURBINE ROTORS**

WESTINGHOUSE T-2 TANKER MAIN GENERATOR COOLERS & MAIN MOTOR COOLERS

19 

Reconditioned — with A.B.S. Units all ready to ship.
Also G.E. Main Generator Coolers

G.E. 525 KW AUX. GENERATOR EXCITER ARMATURE

20 

75-55 KW

NEW STYLE AMPLIDYNE

21 

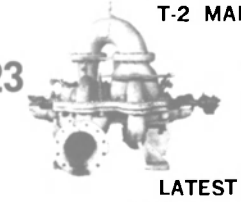
5LY148A2 — type A.M. — frame 605

AUXILIARY GENERATOR ROTORS

22 

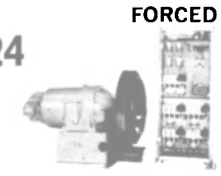
G.E. aux. generator rotors — DORV-325M — for 525 KW turbo generator sets

T-2 MAIN CARGO PUMPS

23 

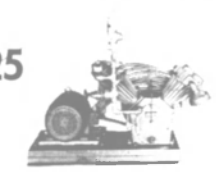
Ingersoll-Rand 6GT — 2-stage — bronze — 2000 GPM — 280' head

LATEST DESIGN 5-SPEED FORCED DRAFT FAN MOTORS

24 

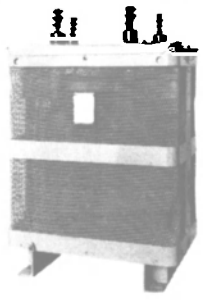
G.E. Model 5M505FE-1 — frame 5055—type M—440/3/60 — serial S.E.6731807. Controller available. (Complete with fan impeller)

T-2 SHIPS SERVICE AIR COMPRESSORS

25 

Worthington — 5½x3½x3½ — VA2 — 20 C.F.M. — 100 lbs. — 5 H.P. Motors — 440/3/60 — 1750 RPM.

WESTINGHOUSE DRY TYPE T-2 CARGO PUMP TRANSFORMERS

26 

200 KVA — single phase — 60 cycle 2300/450 volts — weight 3720 lbs. each. 4 available.

G.E. PYRONOL OIL COOLED TRANSFORMERS

27 200 KVA — single phase — 60 cycles — 2300/450 volts — 3 available.

MISCELLANEOUS DRY-TYPE TRANSFORMERS

28 Lighting Transformers—15 KW— 450/120 volts
Galley Power Transformers—15 KW—450/220 volts

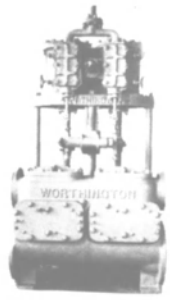
INGERSOLL-RAND 14,000 GPM MAIN CIRCULATOR

29 

14,000 GPM @ 25' head — model 24UCM — bronze — with 125 HP 440/3/60 580 RPM motor. 26" suction — 24" discharge. Can furnish with Westinghouse type CS frame B-876C or GE type KF vertical motors.

PUMPS

BRONZE T-2 TANKER STRIPPING PUMPS

30 

14x14x12 — 700 GPM at 100 lbs. Same pump available in steel for fuel oil transfer, etc.

31 **WESTINGHOUSE 200 H.P. CARGO PUMP MOTORS**
440/3/60 1750 RPM — 40°

MISSION TANKER T2SEA2 CIRCULATING PUMP MOTOR

32 150 HP — 440/3/60/590 RPM. Frame 6335 — type KF — 204 amps

T-2 MAIN ROTOR

33 

LARGE G.E. MAIN PROPULSION SCHENECTADY TURBINE ROTOR

Turbine serial 77418 — reconditioned with certificate. Just out of Beth shop 1970

T-2 MISCELLANEOUS, PUMPS ETC.

34 10 HP Labour Self-Priming Bilge Pumps • Rudder 13½" Rudder Stocks • Main Injection 3-Way Valve Main Condensate Pumps • Fuel Oil Service Pumps Magnablast Breaker • 1 Set New Bull Gear & Pinion for G.E. 525 K.W. Diesel Gen Model S-162 • 32", 24", 15" Rubber Expansion Joints • Mission Tanker Steering Gear Pumps

TURBINE FIRE PUMPS — BRONZE

35 Worthington turbine — 440# — 448° — 3500 RPM — 75 HP — 15# back pressure — 750 GPM @ 125 lbs — 6" suction — 4" discharge.

NEW BLACKMER FUEL OIL TRANSFER PUMP

36

Rotary — 50 GPM — 50 lbs. — 2″ — 5 HP — 440/3/60 — with starter & spares

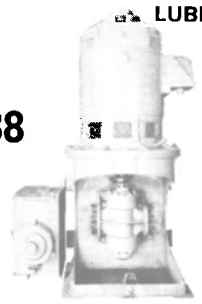
UNUSED BRONZE FEED-WATER BOOSTER PUMPS

37

220/237 GPM @ 144′ head — 2-stage — 1750 RPM with 30 HP 440/3/60 motor control & spares. Built for USN

LUBE OIL SERVICE PUMP

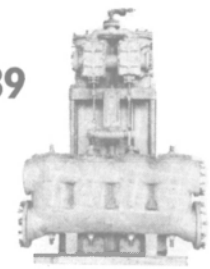
38



Quimby-Rotex — size 6D — 500 GPM @ 70 lbs — 6″x6″ flange — 720 RPM. MOTOR: Allis-Chalmers — 40 HP — 230 VDC — type EBV-147S — stab. shunt — 148 amps. Complete with starter and rheostat — designed originally for C-1MAV-1 vessels.

WORTHINGTON 16″x14″x18″ VERTICAL DUPLEX STRIPPING PUMP

39



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

NEW WORTHINGTON VERTICAL SUBMERSIBLE BILGE PUMP

40

For emergency use on passenger ships, etc. PUMP: JAS — 264 GPM — 171′ head — two 6″ inlets — one 5″ outlet. MOTOR: 40 HP — 230 VDC — 149 amps.

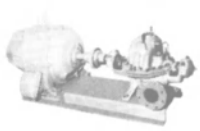
MOTOR-DRIVEN GARDNER-DENVER RECIPROCATING BILGE PUMP

41

50 GPM — 150 PSI — Model ALAXE — serial #106335. 3¾″ bore — 4″ stroke — 2½″ suction — 2″ discharge. 51″ long — 21″ wide — 21″ high — weight 750 lbs. MOTOR: Diehl — 2.5 HP — 440/3/60 — 1750 RPM — 3.53 amps.

GOULD FIRE AND BILGE PUMP

42



Ex-LST — horizontal centrifugal — bronze — 4″ suction — 3″ discharge — 250 GPM @ 100 PSI — 2200 RPM. MOTOR: 30 HP — 230 VDC with magnetic starter.

AURORA HEAVY DUTY BRONZE FIRE SERVICE PUMP

43

Single stage — 2½″ suction — 2″ discharge. 3000 RPM — 250 GPM. 100 lb. head. Impeller diameter 9½″. MOTOR: Air cooled heavy duty 25 HP Reliance T type ON-2S-2½ 230 VDC — 110 amps — stab. shunt.

DIESEL GENERATOR SETS

410 KW ENTERPRISE DIESEL GENERATOR SET

44

Enterprise DSG-6 6-cylinder diesel engine driving Westinghouse generator. 250 volts DC — 1640 amps — 650 RPM — shunt wound.

AUTOMATIC TENSIONING 12X14 STEAM WINCH

45

American Engineering. Drum diameter 24″. Will stow 1500 ft of 1½″ in 8 layers. Capacity 1st layer: 20,000 lbs/100 FPM — 16,000 lbs/50 FPM. Drum width 2′ 6¾″. Steam inlet 3″—exhaust 4″. 8′ 4½″ wide over cylinders. Base 6′ x 6′ 3½″.

46

16″ BRASS PORTLIGHTS

15″ and 16″ brass portlights. 16″ portlights are 3-dog type.

MISCELLANEOUS

47

Big Savings Claimed For Bruce Anchor Retrieval System

A chaser (anchor retrieval device) claimed to save rig operators between $100,000 and $300,000 a rig year has been developed by Bruce Anchor Ltd.

The features which make the patent-protected Bruce chaser of special significance as an anchor retrieval device are its ability to slide freely along chain or wire rope, whether the mooring line is on the seabed surface or deeply buried; to reach a deeply buried anchor by virtue of its own self-burying design; to slide easily on and off the shank of an anchor, and to negotiate chain-to-wire-rope connectors of the composite mooring lines which are becoming increasingly used as exploration moves to deeper waters.

It is claimed that the chaser provides safer working conditions for anchor handling personnel. It has been in service in the North Sea and in the Mediterranean for nearly four years, but the company says it has now established, in conjunction with the Bruce anchor, a chasing system with a proven trouble-free track record.

The Bruce chaser has also been used successfully with hinged fluke anchors, despite the inherent risk of a chaser jamming between the shank and fluke.

For complete information, contact Bruce Anchor Ltd., 82 Northfield Broadway, Edinburgh EH8 7RY, Scotland.

Robert Summerville To Head Electro-Nav Service Department

Electro-Nav president **Robert E. Negron** recently announced that **Robert Summerville** has been appointed manager of all the company's service operations in the United States.

Robert Summerville

"**Bob Summerville** has spent his entire working life servicing and repairing marine electronic communications and navigation equipment," said Mr. **Negron**.

Mr. **Summerville** began his marine electronics career in 1955, when he joined the Tropical Radio Division of United Fruit Company as repair technician. He was their senior field service engineer when he transferred to Decca in 1968.

At Decca, Mr. **Summerville** advanced to shop supervisor, then to manager of the New York Service Depot. In 1975, he was named national service manager. He comes from Decca to Electronav.

Fifteen Mini-Bulkers To Use Navire Hatch Covers

Navire Cargo Gear (NCG) of Gothenburg, Sweden, recently received a second contract from People's Republic of China.

Fifteen mini-bunkers now under construction in Yugoslavia will be fitted with NCG-designed UNI-PULL Hatch Covers manufactured by Inkobord, a member of the worldwide NCG group. Each vessel has four 9.1 by 8.4-meter (about 30-foot by 28-foot) hatch openings.

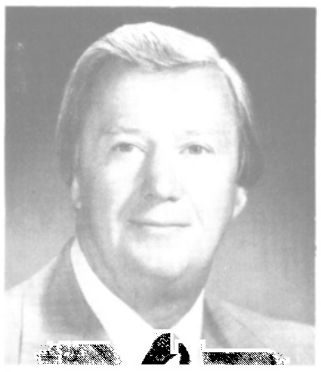
The new vessels will be operated by China Ocean Shipping Corporation of Peking.

Previously, Navire had received a large order for angled stern ramps from PRC for 11 new vessels building in Japan.

For more information on NCG UNI-PULL Hatch Covers and other cargo access equipment, contact Navire Cargo Gear, Box 8991, S-402 74, Gothenburg, Sweden.

Richard Jones Promoted To Sales Manager At Bethlehem Steel

The appointment of **Richard H. Jones** as manager, industrial products sales, in Bethlehem Steel Corporation's shipbuilding department, was announced recently by **David H. Klinges,** vice president in charge of shipbuilding.



Richard H. Jones

Mr. **Jones** is advancing from assistant manager, industrial products sales, and is succeeding **Robert W. Miller,** whose retirement has been announced.

Mr. **Jones** holds a bachelor's degree in industrial engineering and a master's degree in mechanical engineering from Lehigh University.

He joined Bethlehem Steel in 1950 as a member of the Loop management training program, and subsequently was assigned to the railroad products sales division. In 1952, he was transferred to the Baltimore sales district and became supervisor of railroad products there in 1959. Mr. **Jones** was promoted to assistant manager of railroad products sales in the home office in 1972, and was named assistant manager, industrial products sales, shipbuilding in November 1979.

ITT Jabsco Offers Free Booklet Detailing USCG Sanitation Regulations

An informative, 20-page booklet that details the current United States Coast Guard regulations concerning sanitation devices is now available free of charge from ITT Jabsco Products, a unit of International Telephone and Telegraph Corporation.

A manufacturer of accessories for type III waste systems, ITT Jabsco Products has developed the new booklet which explains current regulations and gives USCG timetables for compliance. The booklet also gives helpful installation information to allow an owner to choose the system that is right for his vessel.

For a free copy of the booklet on waste systems, as well as information on freshwater and bilge pumping systems, write **Peggy E. Conlon,** ITT Jabsco Products, 1485 Dale Way, Costa Mesa, Calif. 92626.

Robert H. Osmer Appointed Director Of Engineering For Bulkfleet Marine

Robert H. Osmer has been appointed director of engineering for Houston, Texas-based Bulkfleet Marine Corporation, according to a recent announcement.

In his new capacity, Mr. **Osmer** will have responsibility for design, construction, maintenance, repairs and engineering of the company's unique fleet of Dedicated Deep Notch Tug Barge Units.

Following graduation from the U.S. Merchant Marine Academy, he sailed as engineering officer aboard Texaco U.S.-flag vessels and was promoted ashore as port engineer in 1975. Prior to joining Bulkfleet, Mr. **Osmer** served as senior project engineer-Operations for Exxon Co. USA. He studied for a Master of Business Administration degree from Pepperdine University.

Bulkfleet Marine Corporation is engaged in the design, construction and operation of tug barge units which are under charter to oil and chemical companies for moving materials along the U.S. Gulf, East and West Coasts.

Solar To Design Advanced Cruise Propulsion System For U.S. Navy

Solar Turbines International has begun work on a fuel-saving cruise propulsion system for U.S. Navy ships. Entitled RACER (Rankine-Cycle Energy Recovery), the program calls for Solar to design a system that will capture heat energy from a ship's main gas turbine engines. The heat will produce steam that will provide additional power to the ship's propellers via steam turbines.

Such a system will enable the vessels to get more power without having to burn any additional fuel in the main engines. Through improved fuel economy and extended cruising range, the RACER system will provide important improvements in military characteristics of U.S. fighting ships.

"RACER basically is a seagoing version of our combined-cycle system, which enables users to save energy by extracting more work from a given amount of fuel," said Dr. **Robert G. Mills**, Solar's vice president of engineering, research and advanced development. "We expect to demonstrate the same benefit to the Navy."

"Upon completion of the design-study phase in late 1980, the Navy is expected to award a $15- to $20-million contract for RACER production," Dr. **Mills** said.

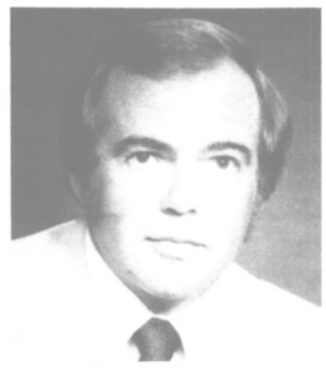
Solar Turbines International manufactures turbine engines in ratings up to 10,600 horsepower that are used in applications worldwide.

New APL Maintenance Facility At Kaohsiung

Jeffrey Theobald has been named Kaohsiung manager for American President Lines, according to **John J. Firman**, managing director, Far East.

It was also announced that **Howard Yurgevich** has been appointed equipment maintenance manager for the company's North Asia operations. He will assist in the start-up of APL's maintenance facility at Kaohsiung, Taiwan, Republic of China.

J.T. Johnson Elected President-Association Of Diving Contractors



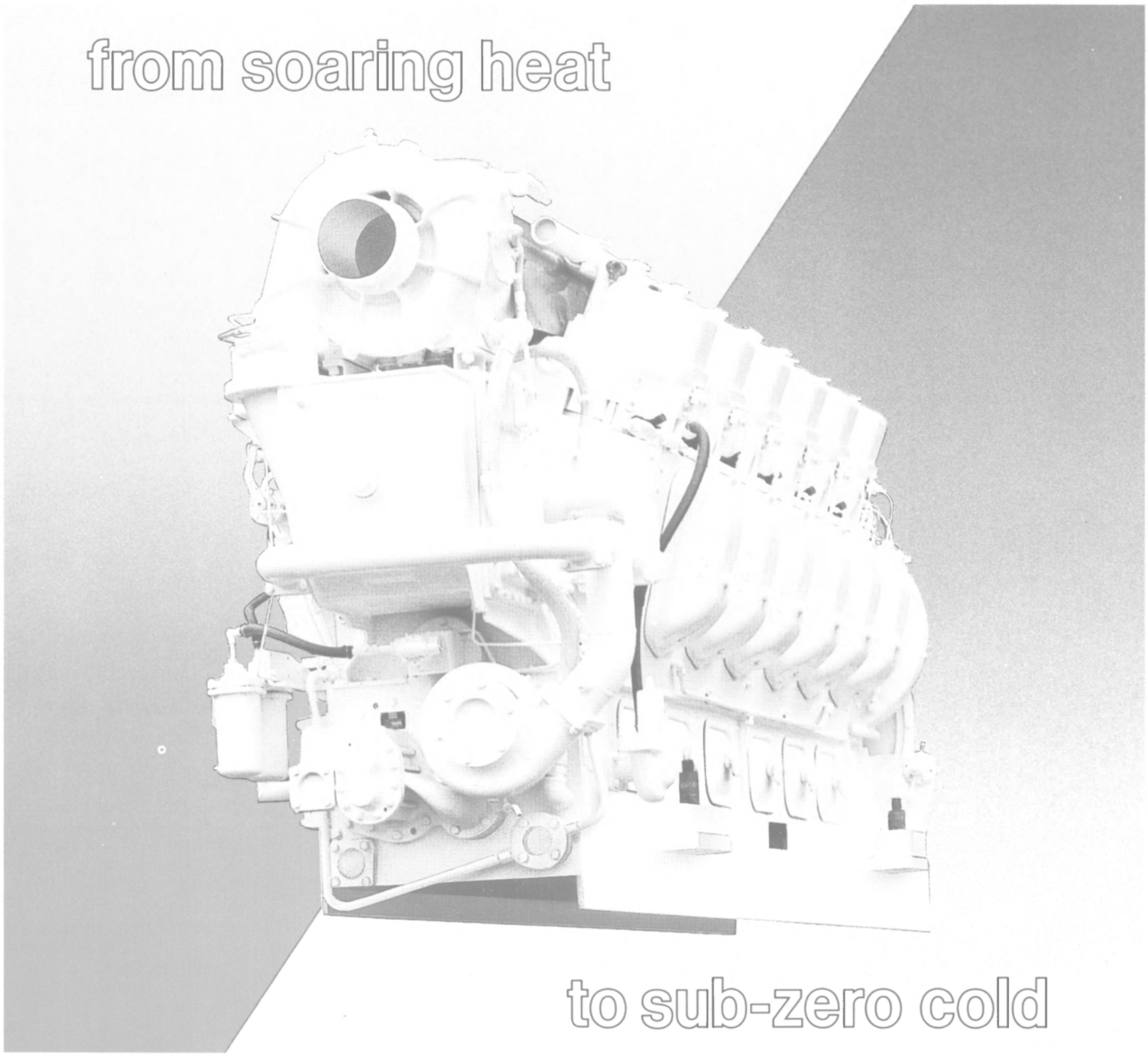
Johnny T. Johnson

Johnny T. Johnson, vice president and general manager for Oceaneering International's U.S. operations, has been elected president of the Association of Diving Contractors. The election took place at the recent annual ADC meeting in New Orleans, La. Mr. **Johnson** has been with Oceaneering since its beginning in the mid-1960s.

The annual meeting, International Diving Symposium '80 featured 126 exhibitors representing the latest developments in the field of diving and diving supplies. In addition, 35 technical papers were presented.

Mr. **Johnson** addressed the membership: "I look forward to our working as a team for the improvement of our valuable and important industry in a growing world of complicated and technical demands. Our group will dedicate a great deal of time and effort to the continual betterment of our technical skills to provide an even higher caliber of services to the industry resulting in high profits and benefits for our industry and employees."

Oceaneering International, one of the world's largest diving contractors, offers services and equipment in all phases of offshore activity.



From the soaring heat of the desert to the sub-zero cold of the arctic, ALCO POWER BOSS diesel engines are at work in hospitals, shopping centers, communication centers, municipal and industrial complexes, petroleum exploration, pumping, locomotive and marine application, and nuclear power plants around the world.

These 4-cycle diesel engines, ranging from an 800 HP in-line 6 cylinder through a 4500 BHP V-18, all have the same bore and stroke, and use the same operating principles. High horsepower to weight ratios, physically small, better scavenging, the turbocharger needs no auxiliary drive.

Design simplicity is the most significant characteristic of the ALCO POWER BOSS. It contributes to the engine's high reliability in service, low cost operation and ease of field maintenance.

Engine cylinder block and base, the main structural members of the engine, are made entirely of fabricated steel and steel forgings. In case of damage, they can be repaired at far less cost than purchase of a new structure.

Get the facts. Write ***Alco Power Inc.***
100 Orchard Street, Auburn, New York 13021
or phone 315/253-3241. Telex: 937-300

ALCO®
Diesel Engines

Privately Owned Deepsea Port Planned For Canada

Plans are being made for a privately owned deepsea port to be built on the lower St. Lawrence River to help handle anticipated increases in Canadian raw materials exports. The project, slated for Gros Cacouna, 175 kilometers east of Quebec City, has been under consideration since the early 1960s.

Federal and provincial ministers signed the relevant documents recently, along with representatives of the main developer, Misener Holdings Ltd. of Toronto. Misener Holdings is assembling a private investment group to finance the project.

The plan calls for construction of a grain elevator with a capacity of about 150,000 tons. This first stage is estimated to cost $60 million. If the project proceeds as planned, the grain elevator is scheduled to start operating in the second half of 1982, involving as many as 250 vessel calls annually.

Depending on demand, other phases would be undertaken to handle more grain and the transshipment of dry bulk materials such as coal, potash and iron ore.

PRC Guralnick Awarded Three-Year Contract

PRC Guralnick has been awarded a second three-year contract to provide design and engineering services to the Supervisor of Shipbuilding, Conversion and Repair, USN, San Diego, Calif., **John L. Torresen**, vice president and chief design engineer, has announced.

PRC Guralnick has a staff of over 100 engineers and designers in San Diego, providing complete naval architecture and marine engineering services to the West Coast marine community.

Planning Research Corporation (PRC) is one of the world's largest diversified professional services organizations serving government, business and industry, primarily in the areas of engineering, architecture, information sciences and services, management consulting, planning and economics. PRC has 280 offices around the world and serves clients in 62 countries.

Two Key Appointments At Kaiser International

Kaiser International Shipping Corp., Oakland, Calif., has recently announced the appointment of **Rob Handel** as manager, commercial planning and insurance. Mr. **Handel** was formerly manager of special projects.

At the same time, it was announced that **Oystein Mathisen,** formerly manager, chartering and commercial trading, has been appointed director of commercial operations.

Variable Output Power Echo-Sounder—Literature Available From Simrad

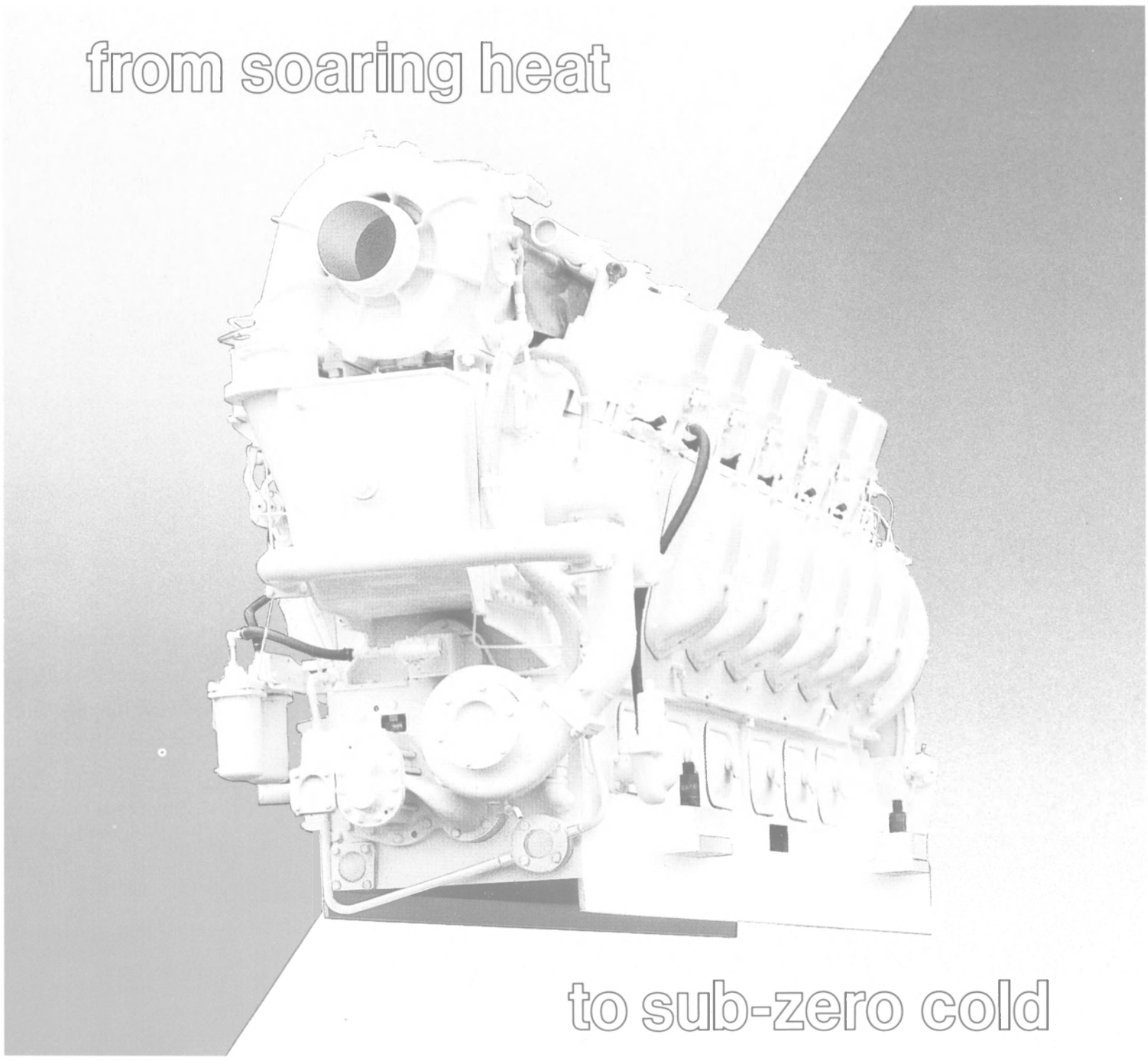
Simrad, Inc. is offering literature on its versatile Skipper 603 Echo-Sounder recorders.

The continuously variable output power option for the 50 Khz version of the Skipper 603 helps distinguish between "Hard and Soft" ground.

The new 200 Khz version Skipper 603 is especially useful for fishermen operating in shallower water since it gives excellent definition of all types of fish that are found in depths of 300-400 feet. The 200 Khz version 603 is recommended for most transom mounts since it usually gives better performance than the 50 Khz model when placed close to the propeller.

For further information, write **Riva Schwartz,** Simrad, Inc., One Labriola Court, Armonk, N.Y. 10504.

from soaring heat



to sub-zero cold

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American Tankships — An Ingram Affiliate Now Constructing Five 37,000 DWT Product Tankers.

Just as Ingram Tankships' integrated Tug-Barge units merited international acclaim for economy, efficiency and profitability, its affiliate American Tankships Inc.'s new building program represents another major Ingram contribution to modern marine transportation.

The five 37,500 DWT tankers represent a new class of ship with a LOA of 658 feet, a beam of 90 feet, and a fully loaded draft of 36 feet. These ships, to be built by NASSCO in San Diego, are among the first U. S. flag coastwise product tankers to be powered with slow-speed diesel engines. American Tankships' new vessels offer further proof of Ingram's dedication to providing the marine industry with innovative technology.

A subsidiary of
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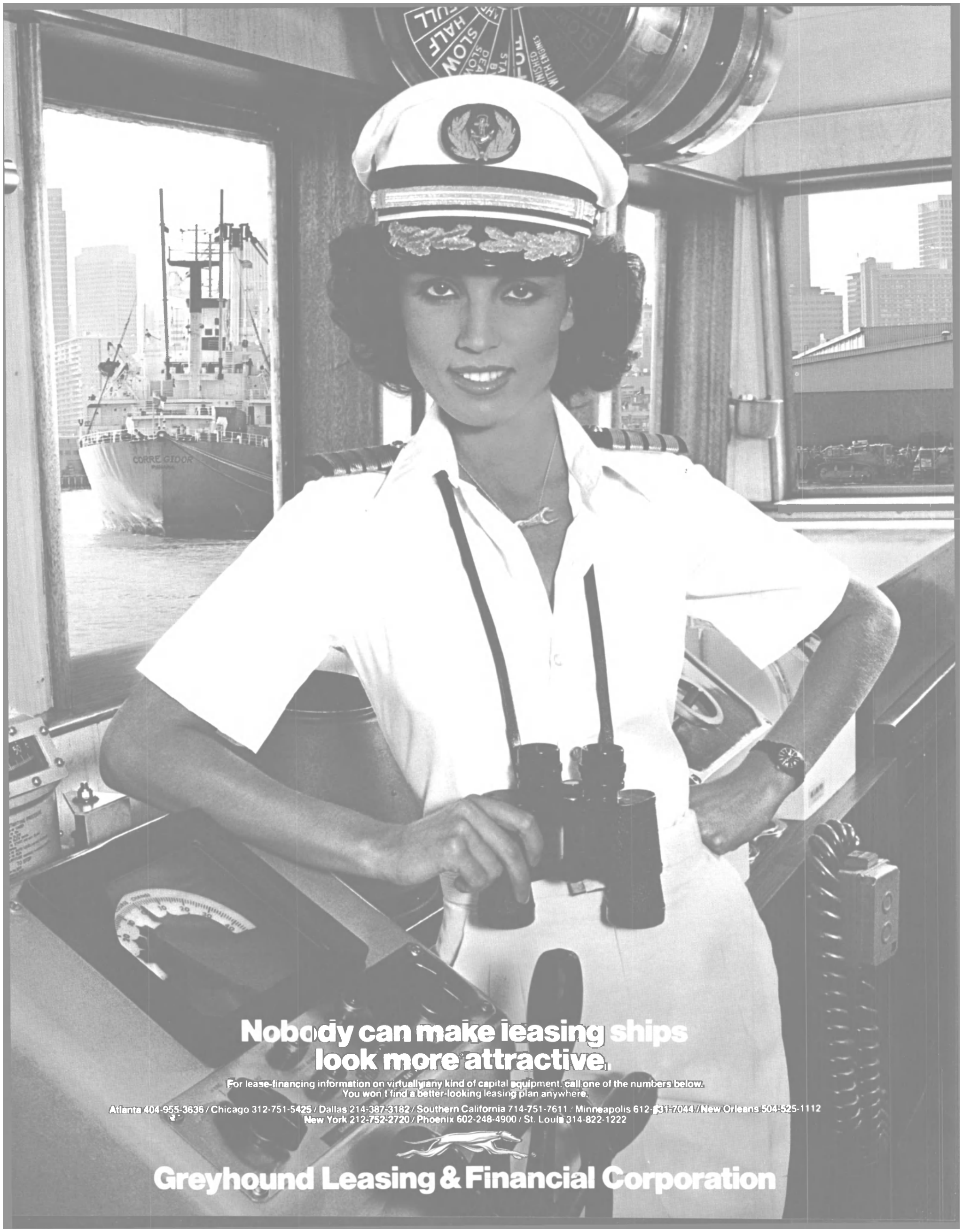
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Greyhound Leasing & Financial Corporation

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¼-Mile Range Scale Featured On SI-TEX Radar —Literature Available

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The display has front panel controls for range selection, picture brightness, anti-rain and anti-sea clutter, electronic range rings plus independent N-S and E-W centering controls.

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For complete information on the SI-TEX/KODEN Model 3, write **David Church**, SI-TEX Marine Electronics, P.O. Box 6700, Clearwater Fla. 33518.

Water Resources Congress Reports Annual Meeting

At its recent annual meeting held in New Orleans, La., the Water Resources Congress elected **Maurice C. Stout**, vice president, Indianapolis Water Company, Indianapolis, Ind., chairman of the board; **Ival Goslin**, consultant, Western Engineers, Inc., Grand Junction, Colo., vice chairman; **B. Joseph Tofani**, Washington, D.C., president; **Samuel F. Collins**, executive vice president and general manager, Sabine River Authority of Texas, Orange, Texas, treasurer; **Lloyd Skinner**, chairman of the board, Skinner Macaroni, Omaha, Neb., secretary; and **William Bricen Miller**, William Bricen Miller & Associates, Chicago, Ill., special counsel. **Vernon Behrhorst**, Office of Water Policy, Office of the Governor, Lafayette, La., and **Charles L. Thomson**, general manager, S.E. Colorado Water Conservancy District, Pueblo, Colo., are past chairmen of WRC.

Attendees at the three-day meeting heard **Charles R. Ford**, Executive Assistant to the Administrator of the U.S. Environmental Protection Agency, call for the exercise of "environmental foresight" in overcoming the damaging effects of toxic substances in water supply systems, degradation of lakes and rivers and contamination of the air.

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The versatile Cat-powered 122-foot by 31-foot by 14-foot Columbia, shown above, has 8,700 cubic feet of space in three holds for salmon, herring or crab.

New MARCO Combination Boat Columbia To Fish The North Pacific

Columbia, the latest 122-foot combination fishing vessel built by MARCO Seattle, was christened in Seattle, Wash., recently by **Kristine Fuller**, daughter of one of the owners.

The all-steel vessel is outfitted for crabbing and for packing salmon and herring. Owners of the vessel include **Charles Bundrant, Philip Fuller, William Howell, Don Leuthold, Kaare Ness, George Schmidt,** and **Don Tucker.**

Dave Kopra, experienced North Pacific fisherman and skipper of the Columbia, is fishing the new boat in the current Alaska tanner crab season. Later, the Columbia will pack herring and salmon before participating in the 1980 Alaska king crab season.

The Columbia is powered by a Caterpillar D399 turbocharged and aftercooled diesel engine that develops 1,125 bhp and is coupled to a Caterpillar 7271 hydraulic reverse reduction gear. The vessel has a Coolidge 90-inch, four-blade stainless-steel propeller.

Auxiliary power is provided by three diesel engines, including a Caterpillar D3408 TA coupled to a 250-kw generator with a MARCO hydraulic pump drive; a turbocharged Caterpillar D3306 TA with a 155-kw generator and a MARCO hydraulic pump drive; and a Caterpillar 3304 T with a 90-kw generator.

The Columbia has three insulated holds and an 80-ton chilled seawater system for salmon and herring packing. For crabbing, the holds provide space for 205,000 pounds of live crab.

Hydraulic deck machinery for crabbing includes a MARCO "KingHauler" for hauling crab pots, a MARCO "KingCoiler" for line handling, an articulated crab pot dumping rack, a bait chopper, and a 12-ton Slattery crane.

Galley, mess area, anteroom, bait and food freezer, stores, and seven-man crew quarters are located on the main deck; pilothouse and captain's stateroom are on the fo'c'sle deck above.

Pilothouse electronics include two radars, two Loran Cs, autopilot, echosounder, depth indicator, and two SSB radios.

The Columbia is the 11th combination fishing vessel for the North Pacific fisheries MARCO has delivered this year.

The Columbia

Length overall	122 feet
Beam (maximum)	31 feet 4 inches
Depth	14 feet
Draft (full load)	14 feet 6 inches
Gross tonnage	198
Speed	12 knots
Power	1,125 bhp continuous at 1.225 rpm
Fuel capacity (maximum)	50,000 gallons
Freshwater capacity	4,000 gallons
Fish holds (3)	8,700 cubic feet

Design: Marine Construction & Design Co. (MARCO), Bruce O. Whittemore, vice president of naval architecture.

Construction: MARCO steel (Hull 383, Seattle).

Deck Machinery: Slattery 12-ton crane with MARCO W3000 winch; (2) MARCO W3000 auxiliary winches; MARCO J0111 KingHauler; MARCO J2111 KingCoiler; Hanson articulating hydraulic crab pot dumping rack; MARCO A5031 anchor winch; Hanson bait chopper.

Main Engine: Caterpillar D399 turbocharged and aftercooled; coupled to Caterpillar 7271 hydraulic reverse/reduction gear.

Propeller: Coolidge 90-inch 4-blade stainless steel.

Steering: Wagner T-18 hydraulic steering with (2) jog stations.

Auxiliaries: Caterpillar 3304T with 90-kw generator; Caterpillar 3306 TA turbocharged with 155 kw generator coupled to a MARCO hydraulic pump drive; Caterpillar D3408 TA turbocharged with 250-kw generator coupled to a MARCO hydraulic pump drive.

Circulating Seawater System: (3) Deming 6M-4021 centrifugal pumps; (3) Lincoln 25-hp motors.

Refrigerated Seawater System: Puget Sound Engineering Refrigeration R-22 system with (2) chillers.

Pilothouse Electronics: (2) Raytheon radars; Simrad recording sounder; Raytheon depth sounder; (2) Raytheon Loran C; Raytheon VHF radio; Northern SSB radiotelephone; Sperry 8T autopilot; Raytheon loudhailer; Bendix wind speed indicator; Northern SSB radiotelephone; Cobra CB radio; Sperry gyrocompass.

Sun Ship Lays Keel For The First Of Three Specialized Vessels For Waterman Steamship

At a recent ceremony held at Sun Ship to commemorate the laying of the keel for the S/S John B. Waterman are, left to right: **John MacKenzie,** resident inspector for J.J. Henry Co., the owner's design agent; **Fred Heess,** project manager for J.J. Henry; **James Blankhorn,** vice president, Operations Support, Sun Ship; **Robert Campbell,** president, Sun Ship; Capt. **Frank Dierson,** Officer in Charge, Marine Inspection, United States Coast Guard, Philadelphia, Pa.; **Edward P. Walsh,** president, Waterman Steamship Corp.; **Joseph Kleschick,** vice president, Marketing, Sun Ship; **William Harrison,** Waterman marine superintendent; **Ron MacAleer,** naval architect for Waterman; **John Dempsey,** vice president, J.J. Henry; **George Thurbon,** Construction Representative, U.S. Maritime Administration; and **Bruce Murray,** Waterman program manager, Sun Ship.

The S/S John B. Waterman is the first of three combination roll-on/roll-off (ro/ro) container vessels being constructed by Sun Ship, Inc., Chester, Pa., for Waterman Steamship Corp. of New York. Delivery of the Waterman is scheduled for April 1981. Its design is very close in basic concept to a new class of ships being actively considered for U.S. military service.

Currently, the Navy and Marine Corps are developing new deployment plans for rapidly increasing the nation's capability to transport fully equipped combat forces overseas, quickly. Under the Rapid Deployment Force (RDF) concept, a fleet of specially designed roll-on/roll-off ships would be stocked with all of the heavy equipment, fuel, supplies and ammunition needed for one month's operations by a full Marine combat brigade. These ships would move to any trouble spot in the world at an instant's notice.

Flexibility of the Waterman design provides for transporting trailers, other wheeled vehicles and containers, as well as unitized and palletized cargoes. The ship is equipped with a full-slewing ramp on the stern and a side cargo port, plus a self-sustaining container crane, for ease of cargo loading and unloading. The Waterman is scheduled to service the North European trade route from Gulf and East Coast ports of the U.S.

The Waterman-class ship has an overall length of 692 feet, a beam of 105.5 feet, and a draft of 33 feet. The new vessels are powered by a steam turbine and can attain a speed of 22 knots at 30,000 maximum shaft horsepower. They have a cargo capacity of 762 forty-foot containers and will be operated by a crew of 35 officers and seamen.

Sun Ship is one of the world's most experienced builders of ro/ro ships, having delivered 10 of these vessels since 1968.

Brochure Available On J.J. Henry Co. Services

The naval architectural and marine engineering firm of J.J. Henry Co., Inc. has recently published a color brochure describing the firm's capabilities, facilities and services offered to shipowners and operators, shipbuilders, ship repair facilities, and industrial firms on both commercial and government programs.

For a free copy of the brochure, write **D.F. McMullen,** J.J. Henry Co., Inc., West Park Drive, Mt. Laurel Industrial Park, Moorestown, N.J. 08057.

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The all-steel vessel is outfitted for crabbing and for packing salmon and herring. Owners of the vessel include **Charles Bundrant, Philip Fuller, William Howell, Don Leuthold, Kaare Ness, George Schmidt,** and **Don Tucker.**

Dave Kopra, experienced North Pacific fisherman and skipper of the Columbia, is fishing the new boat in the current Alaska tanner crab season. Later, the Columbia will pack herring and salmon before participating in the 1980 Alaska king crab season.

The Columbia is powered by a Caterpillar D399 turbocharged and aftercooled diesel engine that develops 1,125 bhp and is coupled to a Caterpillar 7271 hydraulic reverse reduction gear. The vessel has a Coolidge 90-inch, four-blade stainless-steel propeller.

Auxiliary power is provided by three diesel engines, including a Caterpillar D3408 TA coupled to a 250-kw generator with a MARCO hydraulic pump drive; a turbocharged Caterpillar D3306 TA with a 155-kw generator and a MARCO hydraulic pump drive; and a Caterpillar 3304 T with a 90-kw generator.

The Columbia has three insulated holds and an 80-ton chilled seawater system for salmon and herring packing. For crabbing, the holds provide space for 205,000 pounds of live crab.

Hydraulic deck machinery for crabbing includes a MARCO "KingHauler" for hauling crab pots, a MARCO "KingCoiler" for line handling, an articulated crab pot dumping rack, a bait chopper, and a 12-ton Slattery crane.

Galley, mess area, anteroom, bait and food freezer, stores, and seven-man crew quarters are located on the main deck; pilothouse and captain's stateroom are on the fo'c'sle deck above.

Pilothouse electronics include two radars, two Loran Cs, autopilot, echosounder, depth indicator, and two SSB radios.

The Columbia is the 11th combination fishing vessel for the North Pacific fisheries MARCO has delivered this year.

The Columbia

Length overall	122 feet
Beam (maximum)	31 feet 4 inches
Depth	14 feet
Draft (full load)	14 feet 6 inches
Gross tonnage	198
Speed	12 knots
Power	1,125 bhp continuous at 1.225 rpm
Fuel capacity (maximum)	50,000 gallons
Freshwater capacity	4,000 gallons
Fish holds (3)	8,700 cubic feet

Design: Marine Construction & Design Co. (MARCO), Bruce O. Whittemore, vice president of naval architecture.

Construction: MARCO steel (Hull 383, Seattle).

Deck Machinery: Slattery 12-ton crane with MARCO W3000 winch; (2) MARCO W3000 auxiliary winches; MARCO J0111 KingHauler; MARCO J2111 KingCoiler; Hanson articulating hydraulic crab pot dumping rack; MARCO A5031 anchor winch; Hanson bait chopper.

Main Engine: Caterpillar D399 turbocharged and aftercooled; coupled to Caterpillar 7271 hydraulic reverse/reduction gear.

Propeller: Coolidge 90-inch 4-blade stainless steel.

Steering: Wagner T-18 hydraulic steering with (2) jog stations.

Auxiliaries: Caterpillar 3304T with 90-kw generator; Caterpillar 3306 TA turbocharged with 155 kw generator coupled to a MARCO hydraulic pump drive; Caterpillar D3408 TA turbocharged with 250-kw generator coupled to a MARCO hydraulic pump drive.

Circulating Seawater System: (3) Deming 6M-4021 centrifugal pumps; (3) Lincoln 25-hp motors.

Refrigerated Seawater System: Puget Sound Engineering Refrigeration R-22 system with (2) chillers.

Pilothouse Electronics: (2) Raytheon radars; Simrad recording sounder, Raytheon depth sounder; (2) Raytheon Loran C; Raytheon VHF radio; Northern SSB radiotelephone; Sperry 8T autopilot; Raytheon loudhailer; Bendix wind speed indicator; Northern SSB radiotelephone; Cobra CB radio; Sperry gyrocompass.

Sun Ship Lays Keel For The First Of Three Specialized Vessels For Waterman Steamship

At a recent ceremony held at Sun Ship to commemorate the laying of the keel for the S/S John B. Waterman are, left to right: **John MacKenzie,** resident inspector for J.J. Henry Co., the owner's design agent; **Fred Heess,** project manager for J.J. Henry; **James Blankhorn,** vice president, Operations Support, Sun Ship; **Robert Campbell,** president, Sun Ship; Capt. **Frank Dierson,** Officer in Charge, Marine Inspection, United States Coast Guard, Philadelphia, Pa.; **Edward P. Walsh,** president, Waterman Steamship Corp.; **Joseph Kleschick,** vice president, Marketing, Sun Ship; **William Harrison,** Waterman marine superintendent; **Ron MacAleer,** naval architect for Waterman; **John Dempsey,** vice president, J.J. Henry; **George Thurbon,** Construction Representative, U.S. Maritime Administration; and **Bruce Murray,** Waterman program manager, Sun Ship.

The S/S John B. Waterman is the first of three combination roll-on/roll-off (ro/ro) container vessels being constructed by Sun Ship, Inc., Chester, Pa., for Waterman Steamship Corp. of New York. Delivery of the Waterman is scheduled for April 1981. Its design is very close in basic concept to a new class of ships being actively considered for U.S. military service.

Currently, the Navy and Marine Corps are developing new deployment plans for rapidly increasing the nation's capability to transport fully equipped combat forces overseas, quickly. Under the Rapid Deployment Force (RDF) concept, a fleet of specially designed roll-on/roll-off ships would be stocked with all of the heavy equipment, fuel, supplies and ammunition needed for one month's operations by a full Marine combat brigade. These ships would move to any trouble spot in the world at an instant's notice.

Flexibility of the Waterman design provides for transporting trailers, other wheeled vehicles and containers, as well as unitized and palletized cargoes. The ship is equipped with a full-slewing ramp on the stern and a side cargo port, plus a self-sustaining container crane, for ease of cargo loading and unloading. The Waterman is scheduled to service the North European trade route from Gulf and East Coast ports of the U.S.

The Waterman-class ship has an overall length of 692 feet, a beam of 105.5 feet, and a draft of 33 feet. The new vessels are powered by a steam turbine and can attain a speed of 22 knots at 30,000 maximum shaft horsepower. They have a cargo capacity of 762 forty-foot containers and will be operated by a crew of 35 officers and seamen.

Sun Ship is one of the world's most experienced builders of ro/ro ships, having delivered 10 of these vessels since 1968.

Brochure Available On J.J. Henry Co. Services

The naval architectural and marine engineering firm of J.J. Henry Co., Inc. has recently published a color brochure describing the firm's capabilities, facilities and services offered to shipowners and operators, shipbuilders, ship repair facilities, and industrial firms on both commercial and government programs.

For a free copy of the brochure, write **D.F. McMullen,** J.J. Henry Co., Inc., West Park Drive, Mt. Laurel Industrial Park, Moorestown, N.J. 08057.

Bath Iron Works Launches Navy Frigate Ahead Of Schedule

The U.S. Navy guided missile frigate Clifton Sprague (FFG16) was recently launched 19 weeks ahead of schedule by Bath Iron Works.

With guests bundled against the first major snowstorm of the season to hit Maine, the U.S. Navy guided missile frigate Clifton Sprague (FFG16) was launched 19 weeks ahead of schedule by Bath Iron Works, a Congoleum company.

The ship honors the name and memory of the late Vice Adm. **Clifton Albert Frederick Sprague,** USN, World War II hero famed for his exploits with aircraft carriers in Pacific combat. His daughter **Mrs. Courtney Sprague Vaughan** of Monte Sereno, Calif., sponsored the vessel, with her sister, **Mrs. Patricia Sprague Reneau** of Chula Vista, Calif., serving as matron of honor.

John F. Sullivan Jr., president and chief executive officer of Bath Iron Works, welcomed the guests, including principal speaker Congresswoman **Beverly Barton Butcher Byron.** Daughter of Capt. **Harry C. Butcher,** World War II Naval aide to General **Dwight D. Eisenhower,** she represents the Sixth District of Maryland, and is a member of the House Armed Services Committee; and Rear Adm. **Dempster M. Jackson,** USN, Assistant Deputy Commander for ASW and Underwater Systems, Naval Sea Systems Command, who also addressed the gathering.

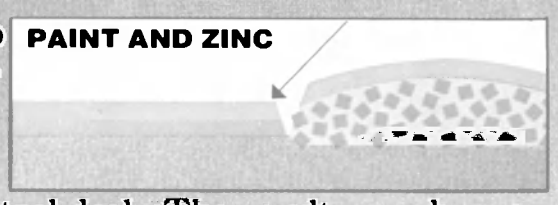
The 445-foot Clifton Sprague, powered by gas turbines similar to jet aircraft engines, is the sixth in a new class of guided missile frigates launched by Bath Iron Works. The new frigate class is designed for defense against submarines, surface ships and aircraft.

The Clifton Sprague will displace 3,600 tons fully loaded. It can be manned by a relatively small complement of 17 officers and enlisted men. Its gas turbines are geared to a single propeller to deliver 40,000 shaft horsepower for a sustained speed in excess of 28 knots.

The Bath, Maine, shipyard has already delivered the first two vessels of the class, the USS Oliver Hazard Perry (FFG7), and USS McInerney (FFG8). Three more of the class, Clark (FFG11), Samuel Eliot Morison (FFG13), and Estocin (FFG15), are currently undergoing final outfitting and testing at the shipyard.

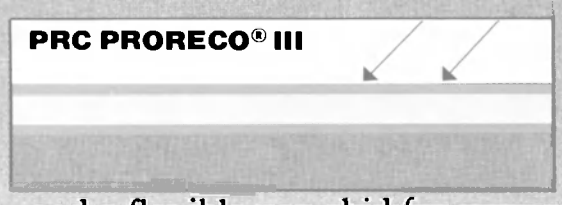
Before a coating can protect your deck, it has to protect itself.

Any damage to the surface of commonly used paint-type coatings will allow moisture to penetrate to your steel deck. The result: man-hours and materials must be invested in deck maintenance constantly, to control corrosion.



After rust has started to deteriorate the metal, you incur additional metal loss in sanding to remove the rust. The high costs of metal replacement become inevitable.

The PRC PRORECO® III system can virtually eliminate both on-going maintenance and major replacement costs. Unlike other coatings on the market, the resilient PRORECO® III system protects against abrasion and impact as well as corrosion. It does this with three layers: a corrosion inhibitive primer which does not sacrifice itself as do the zinc primer systems; an abrasion resistant base coat; and a flexible non-skid for crew safety.



PRC products have a proven track record in the most demanding high-wear conditions. Decks coated with PRORECO® III have seen years of heavy abuse with absolutely no repairs.

Whether you operate towboats, crew or supply boats, offshore drilling platforms, or the largest commercial vessels, you will find that PRC deck coatings pay for themselves many times over.

For information, call your nearest PRC representative or write to Rodney N. Morris, Marine Products Manager, PRC, 5454 San Fernando Road, Glendale, Calif. 91203.

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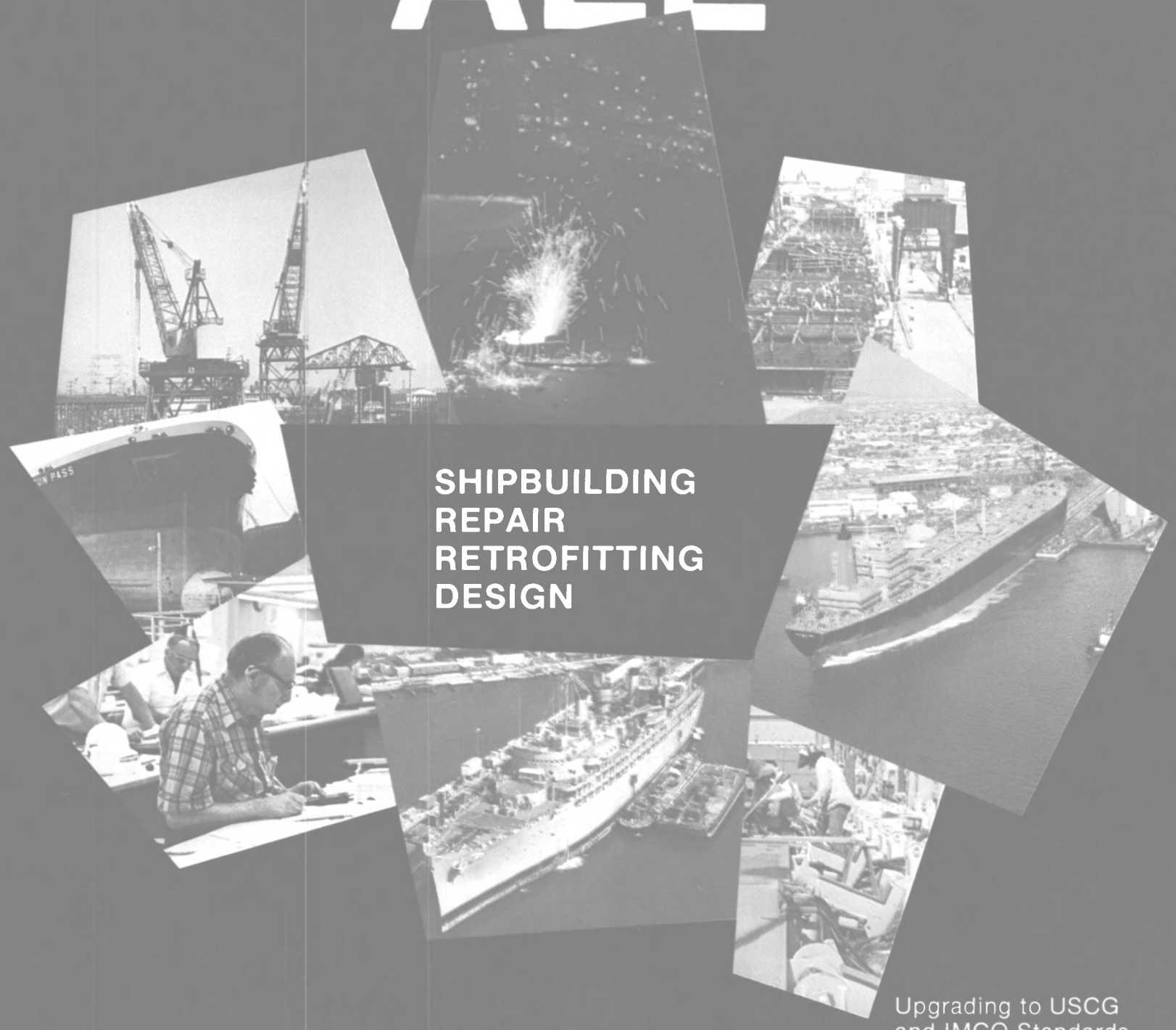

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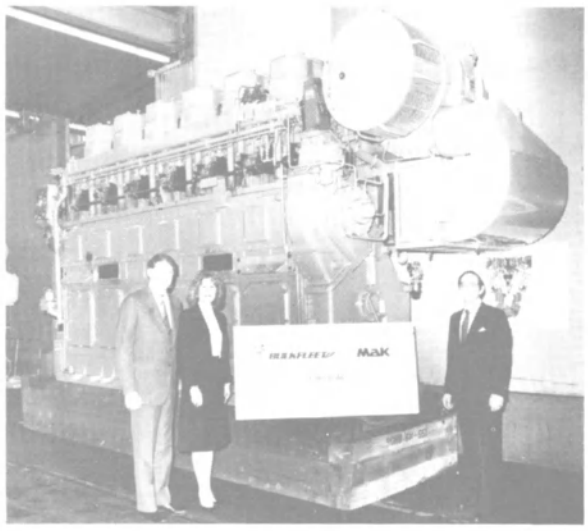
High-Speed Surface Craft Exhibition & Conference At Brighton, England

A High-Speed Surface Craft Exhibition and Conference will be held at the Brighton Metropole and Marina from June 24-27 this year. Organized by Hovering Craft and Hydrofoil Exhibitions Limited, the Exhibition and Conference will bring together the latest in international technology, and commercial and military representatives from all over the world.

For further information, contact Hovering Craft and Hydrofoil Exhibitions Ltd., 52 Welbeck Street, London, W1M 7HE, England.

First Of 4 MaK Diesels For Bulkfleet Marine



Above, **J. Barry Snyder**, president of Houston, Texas-based Bulkfleet Marine Corporation, and **Mrs. Snyder** stand proudly with **Gunther Kuehl**, director of North American sales for MaK engines at the MaK engine manufacturing plant in Kiel, West Germany, with the first of four specially built engines to be delivered to Bulkfleet.

Mr. **Snyder** said that four of these six-cylinder, 4,000-horsepower engines would power two of his company's Deep Notch Tug Barge Units now under construction. The tugs are being built by McDermott Shipyards in Bayou Boef, La., to propel barges which are being constructed by General Dynamics in Quincy, Mass. The two new tug/barge units, expected to be completed in November 1980, will be operated by Bulkfleet under charter to Gulf Oil Corporation. Bulkfleet Marine Corporation is engaged in the design, construction and operation of tug/barge units for charter oil and chemical companies to move materials along the U.S. Gulf and East and West Coasts.

George Cardew Appointed Commodore Of Matson Navigation Co. Fleet

Capt. **George B. Cardew** has been appointed commodore of the Matson Navigation Company fleet, it was announced by **J.P. Gray,** president.

Captain **Cardew,** a veteran Matson shipmaster, will be the sixth commodore in nearly 98 years of the company's U.S. West Coast-Hawaii ocean shipping service. He succeeds Commodore **Charles C. Wright,** who has retired.

Captain **Cardew,** who has been named master of the new containership S/S Kauai, nearing completion at Sun Ship, Inc., first went to sea in 1932 as a deck cadet on a Gulf Pacific Mail Line vessel. He joined Matson as a relief mate in 1936, and has sailed on Matson ships ever since.

The Vito C II leaving Cleveland, Ohio, on builders trials.

G & W Industries Builds The 'Vito C II' —First New Construction For 30-Year Repair Firm

G & W Industries, Cleveland, Ohio, recently completed construction of the fishing trawler Vito C II for **Vito Ciaramitaro** of Gloucester, Mass. The new 96-foot vessel will be used in the North Atlantic.

This vessel marks the first new construction from the Great Lakes for New England in over 10 years, and is the first ever for G & W Industries. The company, however, has been serving Great Lakes marine operators as a voyage repair and conversion facility for over 30 years.

The Vito C II was designed by **John W. Gilbert** of Boston, Mass.

Items of note include an all-stainless-steel lined fish hold, three 3-inch Marlowe bilge, ballast and wash-down pumps, Thermo-king fish hold freezer system, Foster galley refrigeration, Sperry autopilot and Wagner hydraulic steering. Rigging outfit is by Samsel Supply of Cleveland.

For complete information on new construction as well as repair and conversion facilities available at the Cleveland yard, contact **Jack L. Schmidt,** Assistant General Manager, G & W Industries, Inc., 1898 Carter Road, Cleveland, Ohio 44113, or telephone (216) 621-7246.

The Vito C II

Length overall	96'-0"
Beam	24'-9'
Depth	12'-8"
Fish hold capacity	4,300 cubic feet
Freshwater	3,200 gals.
Fuel oil	11,000 gals.

Main engine & generators (By Witt. Armstrong of Hopington, Mass.): Caterpillar 398 rated at 850 hp main engine; Caterpillar 3304 generators rated at 55 kw.

Trawl winches (By Hathaway Machine of Fairhaven, Mass.): 15 AITH's hydraulic with 520-fathom drum capacity.

Electronics (By Crawford Marine Electronics of Gloucester): Radar, Two Decca (one 926C and one 110); Radios, One Marconi CH150 SSB, Two VHF, Two SSB/CB; Depth Finders, Two Simrad EX/sounders; Navigation, Two each Simrad LC 204, Lorain CB, One Raytheon NA 105, Loran A.

Two Managers Appointed At Hellenic Lines, Ltd.

Joseph A. Modica has been appointed general manager of liner services of Hellenic Lines Ltd., the company has announced. Mr. **Modica** was formerly president of Seatrain Europa.

Hellenic also announced that **James F. Theoharides** has been named assistant general manager of the company. Mr. **Theoharides** was formerly vice president of Prudential Lines.

Ft. Schuyler Foundation Receives $2,000 Grant From Texaco Inc.

A $2,000 unrestricted contribution has been presented to the Maritime College at Fort Schuyler Foundation Inc., New York, N.Y., by the Marine Department of Texaco Inc., the college has announced.

The gift is the second unrestricted contribution made to the school by Texaco under a special $4,000 grant program.

Arthur G. Berndt Joins El Paso Marine As Vice President-Operations

The El Paso Company, Houston, Texas, announced that **Arthur G. Berndt** of New York, who has almost 30 years' experience in the shipping industry, has joined its LNG shipping subsidiary, El Paso Marine Company, as vice president operations.

El Paso Marine Company operates a fleet of six of the largest LNG ships afloat. Three more are still under construction. The vessels carry LNG from Algeria to the East Coast of the United States.

Mr. **Berndt** was manager of operations for Energy Transportation Corporation, where he was responsible for seven ships that move LNG from Indonesia to Japan. Prior to joining Energy Transportation Corporation, he was in marine operations with Exxon International and Exxon International Services, including manager of operations for Exxon's fleet of LNG carriers.

His experience also includes work as a senior naval architect and as an industrial/marine safety engineer. Mr. **Berndt** graduated from the United States Merchant Marine Academy in 1946 with a B.S. degree in marine engineering. He has held a license as a marine chief engineer since 1952.

He serves as an advisor to the State of New York Maritime Academy and to the Maine Maritime Academy, and is active in placement of graduates of the U.S. Merchant Marine Academy.

Memberships include Kings Point Alumni, the Port of New York Port Engineers, the U.S. Naval Institute, the American Society of Naval Engineers, and the American Society of Safety Engineers.

Chevron Transport Orders Four 35,000-Ton Tankers From Mitsubishi

Four new 35,000-deadweight-ton petroleum product tankers have been ordered by Chevron Transport Corporation, a subsidiary of Standard Oil Company of California, for service in the company's international trades. The diesel-powered vessels will be built by Mitsubishi Heavy Industries in its yard at Kobe, Japan. One tanker is scheduled for delivery in September 1981, two in mid-1982, and the last in early 1983. These product carriers will be sistership of the two which Chevron ordered in December 1979 for delivery in 1981.

All six of these vessels will meet the safety and environmental requirements of the U.S. Port and Tanker Safety Act of 1978, as well as those of various conventions which have been adopted by the Inter-Governmental Maritime Consultative Organization (IMCO), the maritime agency of the United Nations. They will be equipped with protectively located segregated ballast tanks and inert gas systems.

The addition of this new tonnage to the company's fleet will serve to replace older petroleum product tankers which the company has scrapped over the last five years.

$50-Million Order For World's Largest Ore Carrier

The Hong Kong Trade Development Council reports that the Wah-Kwong Shipping Group recently placed an order for a 260,000-dwt ore carrier, the largest of its kind ever built. The contract was awarded to the Japanese Hitachi Shipbuilding and Engineering Company, Ltd., with delivery expected to be made late next year. The cost has been put at $50 million.

It is estimated that this purchase could be the largest vessel ordered in the world during the past 18 months. In outlining the scope of this order, **Frank Chao,** the president of Wah Kwong noted that, although there are a number of existing oil-bulk-ore (OBO) and oil-ore (OO) combination carriers of more than 270,000 dwt, his company's order is for the largest pure dry cargo ship.

"In my opinion," **Mr. Chao** said, "a 260,000-tonner is ideal for loading and unloading and economical. Carriers in this range will gradually take over the transport of ore from the smaller ships." He predicted that, in the years ahead, smaller ships will concentrate on carrying grain or coal. The normal size of the present dry cargo fleet ranges from 90,000 to 140,000 tons, and the largest ore carrier in use at present is 170,000 tons.

The vessel will be 315 meters in length (about 1,034 feet), with a beam of 55 meters (180 feet), and a draft of 20.4 meters (67 feet). Powered by a 26,500-hp Hitachi B&W 8L90GFCA diesel engine, the vessel is designed for a speed of 14.3 knots.

Royal Viking Line Plans To Enlarge Cruise Ships

Warren S. Titus, president of Royal Viking Line has announced plans to enlarge the passenger carrying capacity of three of the company's cruise ships, the Royal Viking Star, Royal Viking Sky, and Royal Viking Sea.

The company is negotiating with European shipyards for the modifications which would increase the vessels' tonnage from 22,000 to approximately 24,000, and their passenger carrying capacity to 675.

New Line Blind Introduced By Marland Environmental Systems—Literature Offered

Literature is available on a new line blind recently introduced by Marland Environmental Systems, Inc., Walworth, Wis. Ideal for use on tankers, barges and associated applications, the device acts to prevent leakage in inert gas systems and pipelines for fluid cargoes, fuel oil and ballast.

"This isn't just another line blind," said **Bob Daniels,** Marland's vice president and marketing director. "This is an entirely new concept. The Marland Line Blind will virtually eliminate downtime with very little maintenance needed."

In the Marland Line Blind, a pair of steel discs are connected by a spreading mechanism and faced with compressed asbestos gaskets. Positive seating is achieved with no metal-to-metal contact to cause friction and wear. The flow in the piping is sealed tight on both sides with an open space in between.

"To inspect for leakage," explained Mr. **Daniels,** "you just take a quick glance into the open space between the disc. If you ever find a leak on one side, you can stop it before it becomes a problem. All you do is replace the gasket with standard asbestos packing that's available anywhere."

The new line blind is stocked in standard sizes from 2 inches to 18 inches, and can be fabricated to order in custom sizes as well. "Marland's worldwide locations can deliver it right off the shelf anywhere in the world," Mr. **Daniels** added.

For complete information, write **Bob Daniels** at Marland Environmental Systems, Inc., 311 East 83rd Street, New York, N.Y. 10028.

Western Shipbuilding Association Elects Officers

The annual membership meeting of Western Shipbuilding Association (WSA) was held recently in San Francisco, Calif. Rear Adm. **James K. Nunneley**, USN, Deputy Commander for Industrial and Facility Management, Naval Sea Systems Command, Washington, D.C., was the guest speaker.

Admiral **Nunneley** heads the expansive program of repair, alteration and overhaul of all U.S. Navy combatant and auxiliary vessels. He discussed relations between the Navy and private shipyards, the prospects for Navy ship repair and maintenance work in West Coast shipyards during the early 1980s, and some of the problems encountered in overhauling today's sophisticated ships.

Prior to the membership meeting, the WSA board of directors, representing shipyard management and labor, held its annual meeting to elect officers and formulate association policies and programs for 1980. The following officers were elected to serve during 1980:

Chairman of the board, **A.J. Maloney**, Bethlehem Steel Corp., Terminal Island, Calif.; president, **Walter A. Larsen**, Willamette Iron & Steel Co., Portland, Ore.; assistant to the president, **E.J. Glenn**, Willamette Iron & Steel Co., Portland; 1st vice president and director emeritus, **Arthur E. Farr**, Pacific Coast Shipbuilders Assn., Portland; and executive secretary-treasurer, **B.W. Evans**, Barney Evans Public Relations, San Francisco, Calif.

Area vice presidents:

Seattle-Puget Sound Area—James H. Francis, Lake Union Drydock Co.; **John T. Gilbride Jr.**, Todd Pacific Shipyards Corp., Seattle Division; **M.L. Ingwersen**, Lockheed Shipbuilding and Construction Co.; **Frank B. Lynott**, Tacoma Boatbuilding Co.; **Carl R. Meurk**, Todd Pacific Shipyards Corp., Seattle Division, and **John P. Swanson**, Boilermakers International, AFL-CIO.

Portland-Columbia River Area — Clair C. Anderson, Portland Metal Trades Council, AFL-CIO; **W.J. Butler**, Northwest Marine Iron Works; **Bruce D. Hobbs**, Dillingham Marine & Manufacturing Co., and **Larry Rafferty**, Boilermakers, Mount Hood Lodge No. 72, AFL-CIO.

San Francisco Bay Area—Robert K. Boyd, Guy F. Atkinson Co.; **Clarence E. Briggs**, Pacific Coast Metal Trades District Council, AFL-CIO; **Thomas B. Crowley**, Crowley Maritime Corporation; **John M. Lappin**, IBEW, Ninth District, AFL-CIO; **Clifford P. LeGette**, Triple "A" Shipyard, Hunters Point; **Gayne Y. Marriner**, Bethlehem Steel Corp., San Francisco Shipyard; **H.G. Rowe**, Todd Pacific Shipyards Corp., San Francisco Division, and **Walter E. Willard**, Willard Marine Decking, Inc.

Los Angeles-Long Beach Area — James E. Daniels, IUMSWA, AFL-CIO; **C.E. Frost**, Harbor Sandblasting Co.; **Stuart C. Jones**, Todd Pacific Shipyards Corp., Los Angeles Division; **John E. Marriner**, John E. Marriner & Associates; **Steve M. Roberts**, IUMSWA, Local No. 9, AFL-CIO, and **Hans Schaefer**, Todd Pacific Shipyards Corp., Los Angeles Division.

San Diego Area—P.W. Pepper, Pepper Industries, Inc.; **Paul I. Stevens**, Campbell Industries; **Gary Weisfeld**, Triple "A" South, and **W.F. Wild**, Atkinson Marine.

Western Pacific Area—Richard Kuwada, Pacific Container Service, Inc.; **Steven Loui**, Pacific Marine & Supply Co., Inc., and **J.V. Sterling Jr.**, Dillingham Shipyard.

Western Shipbuilding Association has served as spokesman for West Coast shipbuilding, ship repair and allied industries since its founding in 1959. The Association numbers over 175 member firms on the Pacific Coast, including Hawaii.

NABRICO Completes 3 Barges For Binion

Three 195-foot by 35-foot by 11-foot 11-inch double-skin tank barges have been constructed by Nashville Bridge Company (NABRICO), Nashville, Tenn., for Binion Marine Service of Houston, Texas.

The barges are certified by the United States Coast Guard for the carrying of Grade "A" and lower and certain Subchapter "O" products, which include a variety of chemicals and petrochemicals. Each barge is fitted with a cargo system capable of off-loading 10,650 barrels in five and one-half hours, and a steam cargo heating system. These barges have provisions for the future installation of special gauging and vent systems to enable them to carry more exotic chemicals.

The barges are classed by the American Bureau of Shipping with a limited loadline for voyages between St. Marks, Fla., and Carrabelle, Fla., and between Chicago, Ill., and Burns Harbor, Ind.

Cargo capacity for each barge is approximately 10,650 barrels. The cargo dwt at 9-foot draft is 1,475 tons, based on light ship weight of 319 tons.

Founded in 1976, Binion Marine Service today offers transportation on the Gulf Coast of liquid products, such as crude oil, #6 oil, feed stocks, lube oils, chemicals and refined products. The company also offers general towing of customers' barges along the Gulf Intracoastal Waterway, and limited express service between Houston and Chicago.

NABRICO is a wholly owned subsidiary of The American Ship Building Company, Cleveland, Ohio. Headquartered in Nashville, NABRICO has been in the marine field for more than 60 years and is primarily concerned with the design, engineering and construction of grain and coal barges, deck barges, liquid tank barges, cement barges, drydocks and towboats. NABRICO is also a major supplier to the entire marine industry of marine deck hardware.

Key Management Changes Announced By American President Lines

W.B. Seaton, president, American President Lines, Ltd. (APL), recently announced a series of management realignments which he said are designed to strengthen the company's general management capabilities and broaden the corporate experience of key executives. **Bengt I. Henriksen** was appointed vice president, North America; **Richard L. Hill,** vice president, Land Operations; **Timothy J. Rhein,** vice president, Traffic; and **Lorenz P. Robinson,** vice president, Sales.

Mr. **Henriksen** has served as a consultant to the company since May 1979, and was formerly general manager, West Coast, for Maersk Line. Mr. **Hill,** who joined the company in 1977, has served as vice president, Traffic, since October 1978. Mr. **Rhein** joined APL in 1967, and has served as vice president, North America, since January 1978. Mr. **Robinson** has served as vice president, Land Operations, since joining the company early in 1979.

ESCO Offers Brochure On Shellmold Casting

A new brochure on applications of shellmold casting is available from ESCO Corporation, Portland, Ore.

The four-page color folder explains how the Shellcast™ process produces intricate, precise, fine-surfaced castings to extremely close tolerances. Stable molds of Zircon sand and other features of the ESCO process result in smooth finish and dimensional accuracy that can eliminate the need for machining in many cases.

The booklet gives numerous examples of types of castings where Shellcast has been shown to produce superior results and/or lower costs. It gives casting size considerations and explains the technical support available from ESCO for casting design and metallurgical recommendations.

For a free copy of the ESCO Shellcast brochure, write to **Dale Williamson,** ESCO Corporation, Dept. MR, P.O. Box 10123, Portland, Ore. 97210.

A.P. Langlois To Head Management Information At Moore McCormack

Paul R. Tregurtha, president and chief operating officer of Moore McCormack Resources, Inc., Stamford, Conn., recently announced the appointment of **Andrew P. Langlois** to the position of director of Management Information Services. Mr. **Langlois** will plan, coordinate and direct the management information and data processing functions of the company, and provide consulting services to Moore McCormack Resources' subsidiaries on a continuing basis.

Mr. **Langlois** comes to Moore McCormack after holding several executive positions at General Dynamics Corporation, including manager of administration and finance, systems development and programming, and management planning and analysis.

Apelco Literature Describes Three New Depth Sounder Models

Literature is available on three new flasher-type depth sounders introduced by Apelco for the 1980 season.

The Ranger 120 is a dual-scale sounder calibrated for 0-60 and 0-120 feet and designed for small-boat use in lakes, rivers, and bays. For deeper use in coastal waters, the Ranger 360 sounds depths in ranges of 60 feet or 60 fathoms (360 feet). As an offshore fish-finder for any size boat, the Ranger 600 will sound depths in ranges of 100 feet or 100 fathoms (600 feet).

All three models feature a depth warning alarm adjustable from 3 to 50 feet, a bright LED flasher with a light-trap for easy reading, a weather-resistant case, and a sensitivity gain adjustment for fine tuning the bottom readings.

For free literature and complete specifications, write **Stanley Clark**, Apelco Marine Electronics, 676 Island Pond Road, Manchester, N.H. 03103.

Thorpe Named Committee Chairman By Shipbuilders Council Of America

Veteran shipbuilding executive **Richard W. Thorpe Jr.** of Bath Iron Works has been elected to a two-year term as chairman of the Commercial Shipbuilding Committee of the Shipbuilders Council of America, Washington, D.C.

Marine Marketing and Long Range Planning manager of the Bath, Maine, shipyard, he is the first elected head of the committee formed to analyze and implement methods of revitalizing the U.S. merchant marine and its shipbuilding base.

Mr. **Thorpe** describes the committee as a "think tank" to formulate policies and encourage legislation that will result in a practical national maritime policy.

Mr. **Thorpe**, who graduated from the Webb Institute of Naval Architecture as a marine engineer and naval architect, and the Harvard Business School, has been with Bath Iron Works since 1965 in jobs ranging from Navy ship contract administration to corporate long-range planning.

The members of his committee are **Richard C.M. Calvert III**, Newport News Shipbuilding; **Roland V. Danielson**, Bethlehem Steel Corporation, Shipbuilding Division; **Richard Orth**, Sun Shipbuilding and Dry Dock Company; **Gerald A. Livingston**, Avondale Shipyards, Inc.; **Edward L. Pickler Jr.**, Norfolk Shipbuilding and Drydock Corporation; **Stuart C. Jones**, Todd Shipyards Corporation; **Alfred W. Lutter Jr.**, National Steel and Shipbuilding Company; and **Richard Frost**, Maryland Shipbuilding and Dry Dock Company. Valuable staff support has been provided by **Frank R. Kesterman** of the Shipbuilders Council, and **James W. Charrier Jr.** of Charrier, McAteer & Fetting.

Until the recent election, the committee was chaired by **Edwin M. Hood**, chairman, Shipbuilders Council of America, which is comprised of major U.S. shipyards and related industries.

New Full-Color Catalog Features High-Capacity Waukesha Hosepump Line

Waukesha Division, Abex Corp. of Waukesha, Wis., has made available its new 12-page full-color catalog covering the high-capacity Bredel Hosepump line. This versatile new line is capable of handling a wide variety of abrasive or highly viscous fluids and slurries in a wide range of applications, from chemicals to wastewater sludges to food processing.

Included in the catalog are specifications, dimensions, performance charts and a chemical compatibility list.

For a copy of the catalog, contact **James Dahlke,** Waukesha Division, Abex Corp., 1300 Lincoln Avenue, Waukesha, Wis. 53186.

Japan's NKK Delivers World's Largest Class Chemical Carrier To Norwegian Owner

The 16.8-knot M/T Essi Gina, shown above, is equipped with a 10,200-hp, 115-rpm, Mitsui B&W 6L67GF engine.

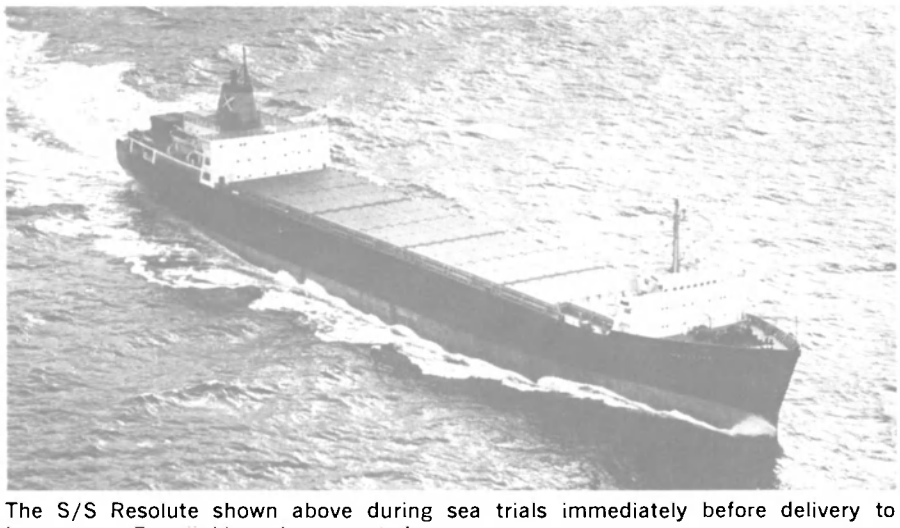
NKK (Nippon Kokan) has delivered a 16,500-dwt chemical product carrier, the M/T Essi Gina, to BJ. Ruud Pedersen A/S, a major Norwegian shipowner. **Masato Hiraki,** NKK New York general manager, said the ship was constructed at NKK's Tsu Works, and is the first large-size chemical product carrier constructed in Japan to fully conform to IMCO MARPOL 1978 regulations.

The M T Essi Gina is 156 meters long (about 512 feet), 21.26 meters wide (70 feet), and has a depth of 12.35 meters (41 feet).

The vessel has a center tank and two wing tanks that can be used to load different chemical products in the "dangerous article" category as defined by IMCO regulations. The wing tanks have 10 compartments each. The center tank has double bulkheads and is divided into eight compartments to reduce the possibility of cargo spill due to hull damage. The inside bulkheads of the center tank are specially coated to withstand corrosive chemicals.

The product loaded in the center tank is pumped to and from shore facilities through cargo pipelines by a hydraulically driven submerged pump. The operation of pipeline valves and cargo tank level monitoring is remotely controlled from the cargo control room, thus reducing crew contact with dangerous products.

S/S Resolute Delivered 13 Weeks Ahead Of Schedule



The S/S Resolute shown above during sea trials immediately before delivery to her owner, Farrell Lines Incorporated.

The $43-million highly automated merchant containership S/S Resolute was delivered to Farrell Lines Incorporated 13 weeks ahead of schedule by Bath Iron Works, a Congoleum Company.

The ship's condition was so excellent that it was delivered directly from sea trials, and a bot-

tom painting, instead of first returning to its Bath, Maine, shipyard for corrections commonly required in new vessels.

"Resolute is as vital to the nation's freedom today as every Liberty ship of World War II," said **John F. Sullivan Jr.**, president and chief executive officer of Bath Iron Works. "We must begin rebuilding our merchant fleet now, with modern ships like Resolute, or face the very real peril of surrendering our economic independence on the seas."

For early delivery of the Resolute, the shipbuilding executive credited his company's management practices and the dedication of its workers for consistently superior performance. He noted that his shipyard recently launched the U.S. Navy guided missile frigate Clifton Sprague (FFG16) 19 weeks ahead of schedule (see page 64 of this issue), and that last November it delivered a similar ship 11 weeks early and $5-million below target cost.

The Resolute is the eighth in a series of Lightning-class containerships of the same basic design produced by Bath Iron Works, and the second of two constructed under an $86-million contract for Farrell Lines Incorporated, New York City. The first, the S/S Argonaut, was completed four months early in June 1979.

The S/S Resolute is 610 feet overall in length, 78 feet in beam, and will displace 26,670 long tons fully loaded at the design draft of 27 feet.

The ship can carry 1,070 twenty-foot cargo containers below and above deck, general cargo on portable platforms, and features accommodations for 12 officers and 29 crew members in fully air-conditioned quarters.

Its General Electric double reduction geared steam turbine will produce 17,500 maximum continuous shaft horsepower to drive a single screw for a normal speed of 22.5 knots. (See MARITIME REPORTER/Engineering News, September 15, 1979 issue, page 12.)

National Supply Names Four Officials To Key Drilling Equipment Posts

National Supply Company, a major manufacturer of oilfield machinery headquartered in Houston, Texas, has named four men to key positions with its drilling equipment product line.

Phillip P. Musmeci was named general manager-subsidiary companies, with responsibility over Par Industries and Derrick Services International, recently acquired by the company to expand its range of drilling equipment. Mr. **Musmeci** brings more than 25 years of National Supply marketing and management experience to his new responsibilities. Par is a shipyard in New Iberia, La., which specializes in design and manufacture of production platforms, barge rigs and small jackups. Derrick Services is a maker of masts and substructures for drilling rigs with manufacturing facilities in Tomball, Texas, and Edmonton, Alberta, Canada.

Donald W. Vogelsang was promoted to area manager-Europe, Africa and the Middle East for National drilling equipment sales, succeeding Mr. **Musmeci**. He will continue to supervise the company's London office where he has been serving as managing director, National Supply Company (U.K.) Ltd., a British subsidiary.

James D. Shaver was named special projects manager. He is responsible for development of a third-generation, hydraulic, automated rig intended for 20,000-foot drilling operations. The new rig is presently under manufacture and is expected to be ready for drilling about mid-year.

Russ J. Wisecup succeeds Mr. **Shaver** as worldwide product manager for drilling equipment. He has his office in Houston, and is responsible for National drilling machinery products, including the administration of production schedules and orientation training of rig crews on operation and maintenance of equipment.

Geological Survey And USCG Plan Joint Study Of Offshore Issues

According to the American Waterways Operators, Inc., the Geological Survey and the Coast Guard have announced plans to begin a joint study of the adequacy of existing safety and health regulations, and of the technology available for exploration, drilling, development and production of oil and gas on the Outer Continental Shelf.

This study is mandated by the Outer Continental Shelf Lands Act Amendments of 1978 (P.L. 95-372).

All offshore activities, except diving, will be included in the study. The Coast Guard notes that it is particularly interested in occupational safety and health in maritime and industrial operations and in environmental protection in connection with transfer of oil or hazardous materials between vessels and facilities.

The Marine Board of the National Academy of Sciences has been asked by the Geological Survey to provide substantial input.

Comments should be submitted by April 28 to Chief, Conservation Division, U.S. Geological Survey, National Center, Mail Stop 640, Reston, Va. 22092.

Consult the February 28 Federal Register for a complete analysis. Copies of this notice may be obtained from American Waterways Operators, Inc., 1600 Wilson Boulevard, Suite 1101, Arlington, Va. 22209.

White Appointed VP Of Water Technologies Div, Aqua-Chem, Inc.

F. Marshall White has been appointed vice president, operations for the Water Technologies Division, Aqua-Chem, Inc., according to an announcement by **Lee J. Hartenstein,** division president.

F. Marshall White

Mr. **White** was formerly director of operations with responsibilities for manufacturing, inventory control, purchasing, labor relations, and manufacturing engineering. Prior to that, he was manager of manufacturing, and earlier was manager of production and inventory control. Mr. **White** joined the company in 1966 as PERT analyst.

The Water Technologies Division is headquartered in Milwaukee, Wis., and manufactures a variety of marine and land-based seawater desalters and water pollution control systems for use around the world.

Kvaerner Offers Literature On Ro/Ro Equipment Line

One of the leading manufacturers of hatch covers, Kvaerner Brug A/S, is now offering literature on their full range of ro/ro equipment, including bow and stern ramps, slewing and angled ramps, bulkhead doors, elevators, and hoistable cardecks with built-in ramps.

Kvaerner offers their standard version of the Flexible Slewing Ramp with a ramp length of 40 meters (about 131 feet), providing clear driveway width of 7 meters (23 feet), with a ramp/door weight of approximately 185 tons, and a maximum axle load of 60 tons.

Free literature on Kvaerner's Flexible Slewing Ramp and other ro/ro equipment can be obtained by writing **K. Mogedal,** Design Section Manager-Shipbuilding Group, Kvaerner Brug A/S, Kvaernerveien 10, Oslo 1, Norway.

Title XI Aid Asked For Five Cement Barges Costing $10.5 Million

Marquette Co., Nashville, Tenn., has applied for a Title XI guarantee to aid in financing the construction of five self-unloading cement barges costing $10.5 million.

The barges are being built by Nashville Bridge Co. and Ingalls Shipbuilding. Deliveries are expected by mid-year.

398,000-Ton Tanker Pacific Joins General Electric Credit Corp. Fleet

The 398,000-deadweight-ton tanker Pacific has been added to the fleet of General Electric Credit Corp., the Stamford, Conn.-based company recently announced. With the addition of the Pacific, GECC now owns 14 tankers.

The Pacific is the last of four tankers to be acquired through a leverage lease transaction and then chartered to the Shell Oil Co. The other vessels are the Alaska, the San Diego, and the Atlantic, the largest commercial vessel to be built in the Western Hemisphere, and a sistership of the Pacific. (See cover story, MARITIME REPORTER / Engineering News, April 15, 1979). The Pacific's builders, Newport News Shipbuilding, put the price of the vessel at $89 million.

GECC, a subsidiary of the General Electric Co., acquired its first vessel in 1973 and today owns 2,528,000 deadweight tons in U.S.-flag tankers.

The company has indicated plans to acquire this year three integrated tug-barges now under construction at the Avondale Yard, New Orleans, La.

Japan's NKK Designs Wave Energy Power Generation System

The technical staff of NKK's Tsu Research Laboratories has worked out the basic design of a dolphin type, wave energy absorption/power generation system permitting 100 percent absorption and effective use of ocean wave energy.

Masato Hiraki, NKK New York general manager, said the major components of the system are a dolphin, connecting rod (arm), floating body and two generators.

The floating body rolls and heaves due to wave-exciting forces, thereby generating relative revolving movements of the floating body and the connecting rod, and of the connecting rod and the dolphin. In this instance, revolutions are amplified by the use of gears.

The revolving movements are used as driving forces for power generators. In this manner, wave energy can be completely absorbed and concurrently used as driving forces for power generation.

Experiments using a scale model were conducted recently in public at Tsu Research Laboratories 60 m x 3 m x 1.5 m test basin. In the experiments, designed wave energy of 90 watts was applied to a floating body measuring 3 m x 1 m x 0.5 m. It was confirmed that wave energy was completely absorbed, resulting in the complete elimination of waves, and some 70 watts was recovered as electric energy. The margin of 20 watts was mechanical loss. Research will be continued on generation systems and structural analysis of the dolphin prior to offshore experiments.

In addition to power generation, the system can be utilized to provide pump driving power for desalination equipment and equipment for absorbing uranium in the sea. The system enables complete elimination of waves, thus providing suitable sites for fish farming, offshore recreation and port facilities.

Details of the experimental results will be announced at the 13th Symposium on Naval Hydrodynamics to be held in October in Tokyo.

NKK (Nippon Kokan) is Japan's second largest steelmaker and only integrated steelmaker/engineer-constructor/shipbuilder.

$23-Million Subcontract To Oceanic Contractors, Inc. For North Sea Modules

Oceanic Contractors, Inc., a subsidiary of J. Ray McDermott & Co., Inc., New Orleans, La., announced that its McDermott Scotland Division has been subcontracted by Taywood-Santa Fe Ltd. for a sum in excess of 10 million pounds sterling (approximately $23 million) to build three topside facilities modules for installation in the North Sea.

McDermott Scotland will fabricate the utility, power generation, and water treatment modules for the Shell/Esso North Cormorant development platform in Block 211/21 of the North Cormorant Field in the United Kingdom sector of the North Sea. The work will also involve pre-commissioning, pre-hookup, loadout and sea fastening of the modules.

The utility module will weigh 1,150 metric tons; the power generation module, 1,200 metric tons; and the water treatment module, 1,400 metric tons. Work on them is now underway at McDermott Scotland's Ardersier fabrication yard, and they are scheduled to be fastened for sea towing by late April of 1981.

McDermott is a leading international energy services company. The company and its subsidiaries provide engineering and construction services to the offshore oil and gas industry, and manufacture steam generating equipment, tubular products, refractories, and automated machine tools.

Title XI Granted For $3.1-Million To Rebuild Tender 'Seadrill II'

The Maritime Administration has approved a Title XI guarantee to Sea Drilling Corp., New Orleans, La., to rebuild the drilling tender Seadrill II. The work is to be done by American Marine Corporation, New Orleans, La. Completion is scheduled for June 1980. The 330-foot nonself-propelled tender will operate on Lake Maracaibo in Venezuela. The estimated cost is about $3.1 million.

Globtik Tankers Group Signs Contract For 80,000-Ton Tanker

Ravi N. Tikkoo, chairman of Globtik Tankers Group, has recently exercised his option with Ishikawajima-Harima Heavy Industries Co., Ltd (IHI), Japan, for construction of the third ship of a series of 80,000-dwt diesel tankers.

These tankers have a shallow draft of 40 feet and are equipped with fuel efficient IHI SEMT-Pielstick medium-speed diesel engines.

The vessel is to be registered under the U.K. flag and manned by a British crew. Delivery is scheduled for June 1981.

Navire Receives Order From Chinese Owners For Angled Stern Ramps

Navire Cargo Gear (NCG) has announced receipt of a large order for angled stern ramps from the People's Republic of China.

Involved are 11 new ro/ro vessels now under construction at several Japanese shipyards, with all ships scheduled for delivery during 1980. The contract, issued by China Merchants Steam Navigation, is for an NCG design based on the "PARALLA" type ramp.

Individual stern ramps vary with vessel class, but all range in length from 32 to 36 meters (about 105 feet to 118 feet) and will handle standard 40-foot MAFI road trailers. The largest ramp, 16 meters wide (about 52 feet), will accept heavy load vehicles to 200 tons total weight, while all ramp systems will handle an extremely wide variety of fork-lift trucks, LUF units and other typical cargo vehicles. Ramps will be supplied by Kayaba Industry Company, Ltd., NCG's Japanese licensee.

For complete information on NCG's extensive line of cargo access equipment, contact Navire Cargo Gear, Box 8991, S-402, 74 Gothenburg, Sweden.

Kockums Receives Order For 19.8-Knot Ro/Ro

Kockums AB, Malmo, Sweden, has recently received an order for a 20,000-dwt ro/ro vessel from the Johansson Group, Skarhamn, Sweden. The delivery date is late in 1981 and will follow two other ro/ro vessels which have been ordered by the Johansson Group.

The ship will be able to handle 1,040 containers (size, 20 feet), and will carry passenger cars but no passengers. The vessel will be 194 by 28 meters (about 637 feet by 92 feet), and will have twin diesel engines with a combined output of 21,200 hp and a contracted speed of 19.8 knots.

William A. Wood Joins Giannotti & Associates

William A. Wood has joined Giannotti & Associates, Inc. as chief naval architect. The announcement was made recently by Dr. **Paul Van Mater Jr.**, vice president of the Annapolis, Md., firm. Mr. **Wood** was formerly with the Central Technical Division of Bethlehem Steel Corporation where he also served as chief naval architect.

William A. Wood

Mr. **Wood** has 14 years of experience in the design of commercial vessels and offshore platforms. He holds B.S. and M.S. degrees in naval architecture and marine engineering from the University of Michigan. Mr. **Wood** is a member of the Hull Structure Committee of The Society of Naval Architects and Marine Engineers and is chairman of SNAME Panel HS-7 (Vibrations).

Joe Pertofsky Heads New Henschel/Nelson Div.

Henschel Corporation, a unit of General Signal, has announced the formation of a new division, Henschel/Nelson, located in Tulsa, Okla. Henschel/Nelson was formerly the Marine Products Group of Nelson Electric, another unit of General Signal.

The new Henschel/Nelson Division is under the direction of **Joe Pertofsky,** vice president and general manager. This organization will continue to supply shipboard electrical distribution and control equipment, including power and signal switchboards, as well as marine electrical hardware.

The executive offices of Henschel Corporation remain in Amesbury, Mass. As in the past, the Henschel staff and facilities in Amesbury will continue the design, development and production of ship control and interior communication equipment and systems for Naval and commercial ships.

All personnel formerly in Nelson Electric's Marine Products Group have transferred to Henschel/Nelson. The office and main plant of Henschel/Nelson will soon move to facilities now under construction in Tulsa. Marine hardware equipment will continue to be produced at a facility in Homer, La.

The increased capability resulting from the formation of the Henschel/Nelson Division will permit Henschel Corporation to better serve the needs of the Navy and marine industry.

For further information, write **John Landers,** Henschel Corporation, 14 Cedar Street, Amesbury, Mass. 01913.

Marathon Utilizes Computer Graphics For First Computer-Designed Offshore Rig

The Gulfwind, the first completely computer-designed offshore jackup drilling rig, is under construction for Chiles Drilling Company of Houston, Texas, at Marathon LeTourneau Company's Brownsville, Texas, yard, Marathon announced from its Houston headquarters.

The Marathon-class 150-44-C cantilever-type jackup drilling rig was designed by a new Computer Graphics Section at Marathon Marine Engineering Company, division of Marathon Manufacturing Company. The new drafting-design system was formed as a state-of-the-art way to more efficiently and economically improve engineering drafting procedures, a Marathon spokesman said.

In addition to being computer-designed, the Gulfwind is being engineered and constructed by Marathon LeTourneau to incorporate every practical feature for efficient offshore drilling operations, plus comfortable living quarters for at least a 40-man crew.

To be fully equipped for exploratory or development drilling up to 15,000-foot depths, the Gulfwind has an unusual cantilever design permitting drilling multiple wells without moving the rig.

In order to design the Gulfwind by computer, many of Marathon's engineering drafters have been retrained to extend their knowledge into the sophisticated computer-aided graphics area to become computer drafting specialists.

Five new computer graphics modules with fully trained drafters-operators can draft a rig design at least twice as fast as the tedious manual drafting procedure, it was said.

A computer drafter sits at the console of one of five computer graphics modules in the Computer Graphics Section at Marathon Marine Engineering Company, on which a drafter-operator can draft a design for an offshore jackup drilling rig twice as fast as by the manual procedure.

The computer design module works like a typewriter attached to a video screen and is used to create a visual design or layout of a rig. These units can project graphic illustrations such as structural shapes, connection details, welding symbols, and other engineering symbols onto the screen where required on the rig layout, and as many times as needed.

Complex engineering drawings are thus possible by programming the system to do extensive mathematical calculations that can be interacted with the graphics system, according to the spokesman.

The Chiles's Gulfwind rig order, described a "Hull 152" at Marathon, started on its way in Marathon Marine Engineering's General Arrangements Group, after receiving a set of rig specifications supplied by Chiles Drilling Company, Here, the general rig layout and owner-specified modifications are incorporated into the design via one of the computer design modules.

The general rig layout includes an overall view of the rig, general layout of machinery and main decks, crew quarters, and inter-bottom tanks. The layout is dispersed to four other computer-graphics drafting disciplines, a Structural Group, an Electrical Group, a Mechanical Group, and Piping Group, each with its own computer-graphics module.

Concentrating on the hull design of the rig, the Structural Group specifies the size and type of steel to be used in rig construction. Some 30 computer-aided drawings are

After a computer-drafted offshore jackup drilling rig design has been completed and approved, finished drawings are made on the Computer Plotter by a drafter, shown here at the Plotter console. The drawings can be stored for recall at any time from the computer's Central Processing Unit, shown at left. Finished and approved drawings are made on the Computer Plotter, shown here on the readout at right. The Computer Digitizer is also used to trace existing drawings, which can be stored in the Central Processing Unit for recall onto the Plotter for a finished drawing.

required to show plating and framing for the bottom, machinery and main decks, spud wells for the jackup legs, and bulkheads and structural frames.

The Electrical Group executes about 40 computer-graphics drawings for the lighting, telephone and general alarm systems for the rig. They also lay out drawings for the wiring systems for any specified cranes, winches, and skidders for the drill floor.

Approximately 15-20 computer-graphics drawings are required from the Mechanical Group, which develops the drawings for the heavy structural skid rails, pipe racks, gear boxes, generators, water towers, crane columns, and spud legs.

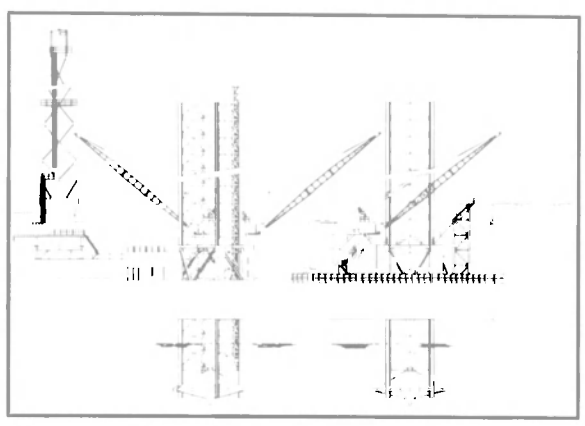
All industrial piping computer-graphics drawings for the drilling function of the rig is provided by the Piping Group, as well as all standard rig piping such as bilge, ballast, pre-load, potable water, and sanitary and fire systems, all requiring some 30 drawings.

After a rig design has been completed and approved, finished drawings are made on a Computer Plotter and stored for recall at any time in a Central Processing Unit. Finished (approved) drawings are made on the Computer Plotter. A Computer Digitizer is also used to trace existing drawings, which can be stored in the Central Processing Unit for recall onto the Plotter for a finished drawing.

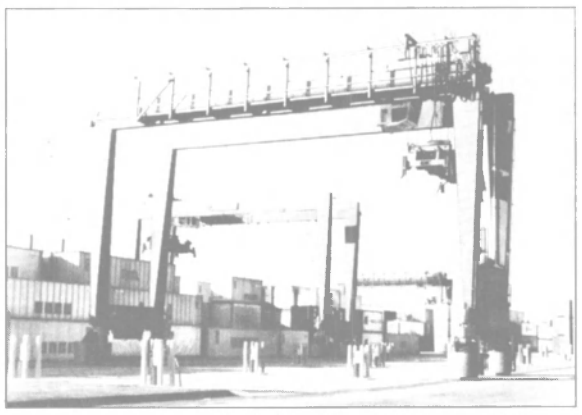
The Chiles's Gulfwind has been designed with a 153.5-foot by 160-foot hull to provide generous deck space for efficient drilling operations. The rig's 248-foot-long legs can be recessed into the hull for towing into waters as shallow as 15 feet. The rig elevating system will extend the legs at the rate of 90 feet per hour to position the rig on station in waters up to 150 feet deep.

According to Marathon engineers, the Gulfwind is designed to be ideally adapted for relatively shallow-water drilling operations. Though specially designed by Marathon for the Gulf of Mexico, it will perform just as efficiently off the West Coast of Africa, in the Caribbean or Indonesian waters, or wherever similar environments are found, it was said.

Marathon LeTourneau Company is a division of Marathon Manufacturing Company, Houston. In addition to being the leading manufacturer of mobile offshore jackup drilling rigs, the parent company is a multiproduct company manufacturing materials handling equipment, steel products, steel buildings, white oils, batteries, consumer goods, and providing civil engineering and construction services. It is a subsidiary of The Penn Central Corporation.



This computer-drafted drawing is part of the design for the first completely computer-designed offshore jackup drilling rig, the Gulfwind, now under construction for Chiles Drilling Company of Houston at Marathon LeTourneau Company's Brownsville, Texas, yard. The Marathon-class 150-44-C cantilever-type jackup drilling rig was designed by a new Computer Graphics Section at Marathon Marine Engineering Company.



PACECO TRANSTAINER® AT I.T.S., LONG BEACH—International Transportation Service, Inc. recently accepted delivery of its eighth Transtainer crane from Paceco, Inc. of Alameda, Calif., a subsidiary of Fruehauf Corporation, Detroit, Mich. The new 30-long-ton rubber-tired terminal crane has a 74-foot span for a stacking capacity of four containers high and six wide, plus a tractor roadway. The crane's cab is air-conditioned for operator comfort, and floodlights are provided for night work. Paceco's Gulfport, Miss., plant produced the new Transtainer crane, and Paceco's Alameda-based Field Operations Department supervised the erection of the crane on site.

Rain Associates Plan $6.3-Million Tank Barge —Title XI Guarantee Sought

Rain Associates, Bronx, N.Y., has applied for a Title XI guarantee to aid in financing the construction of a 106,000-barrel tank barge for operation along the U.S. Atlantic Coast. The builder is Todd Shipyards, Galveston, Texas. The barge is scheduled for completion in September. The estimated cost of the vessel is $6.3 million.

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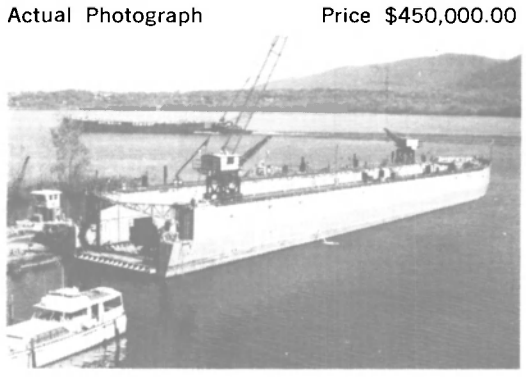

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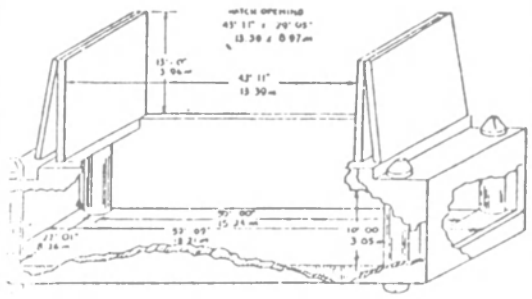

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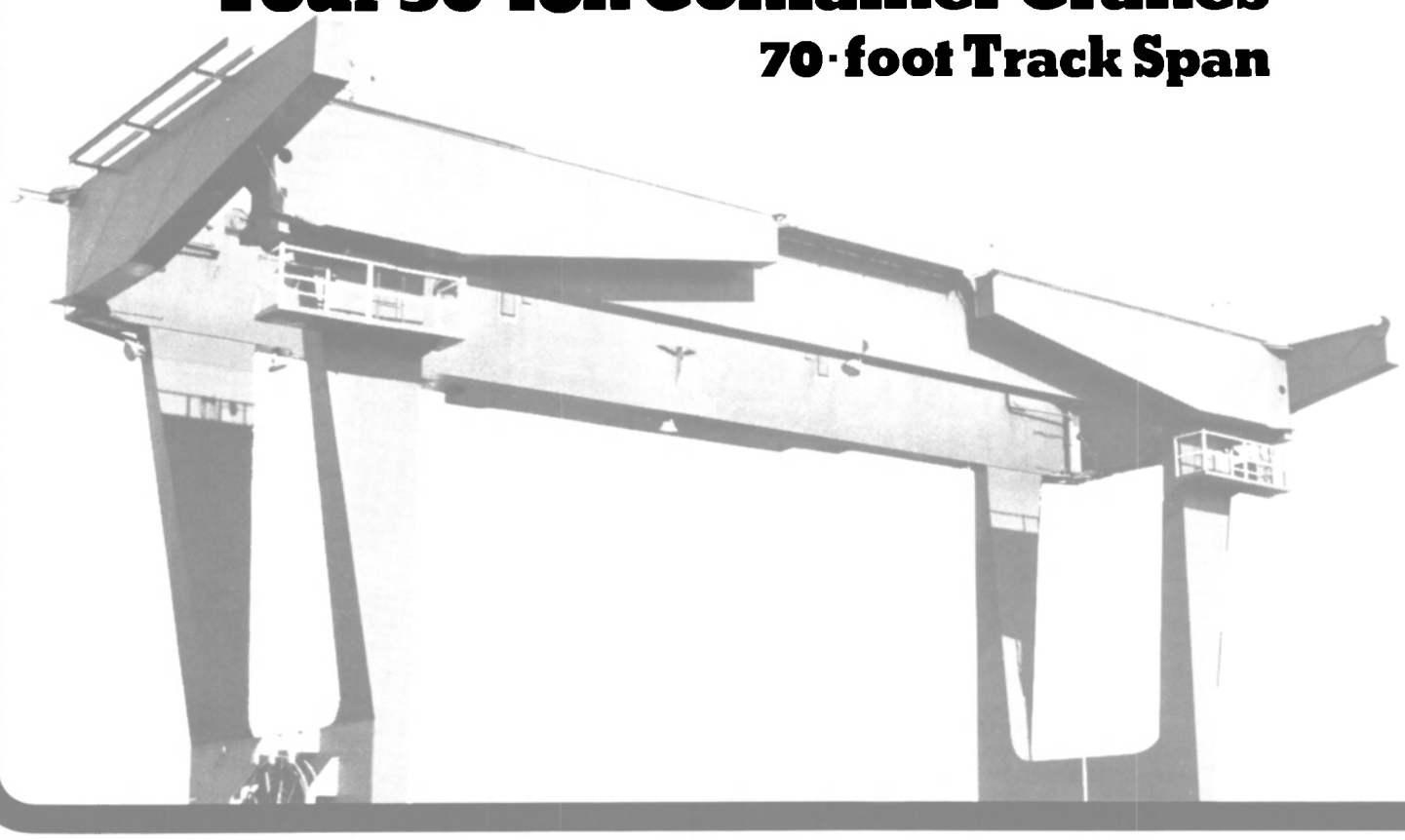

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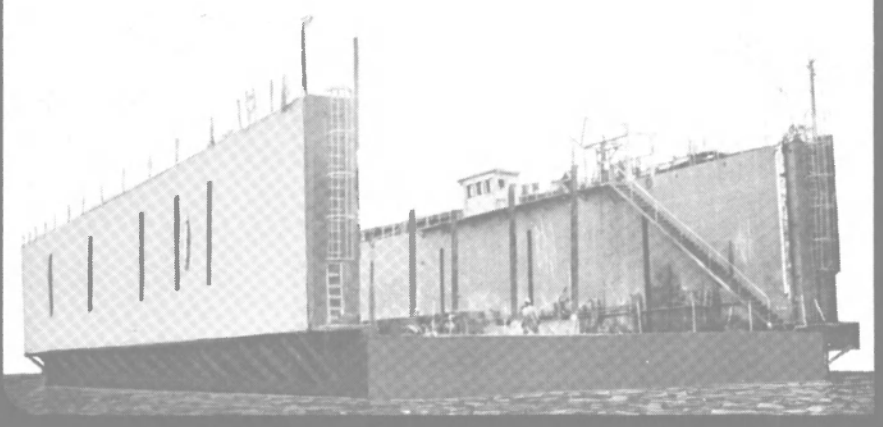

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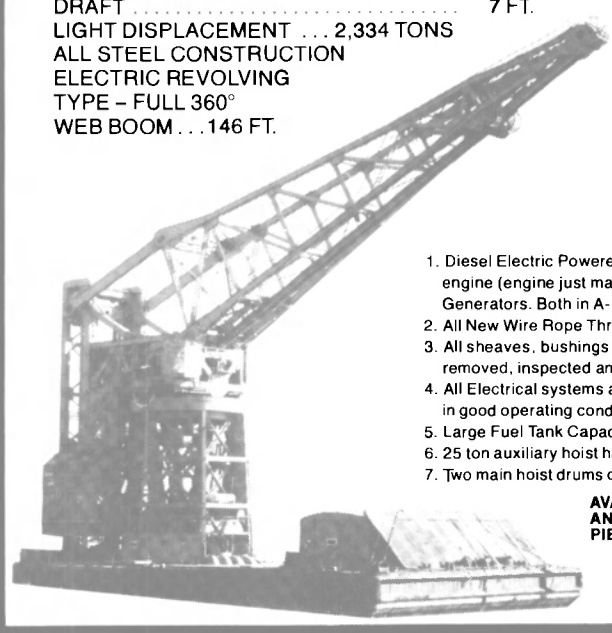

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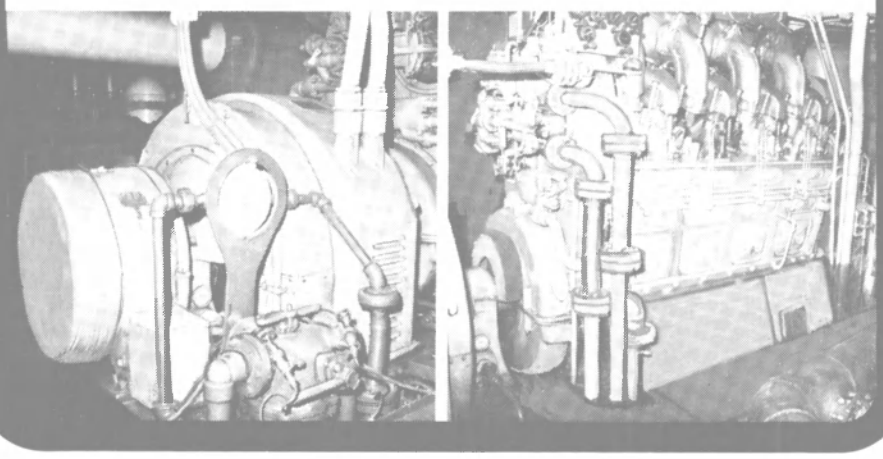

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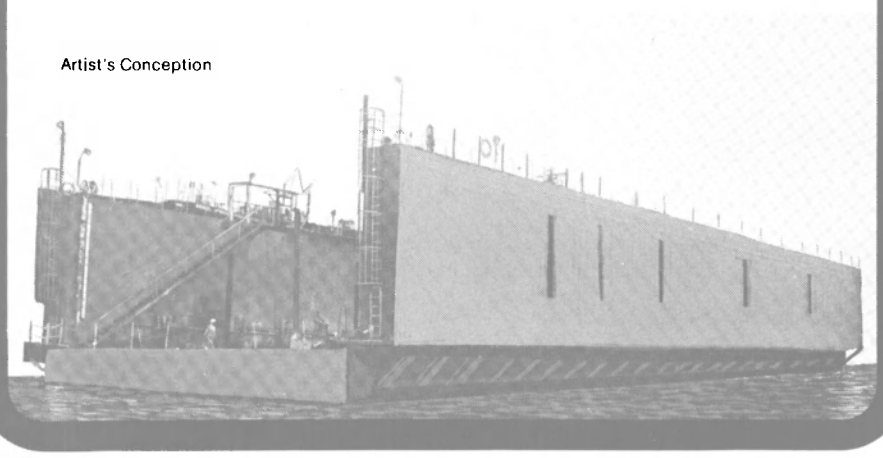

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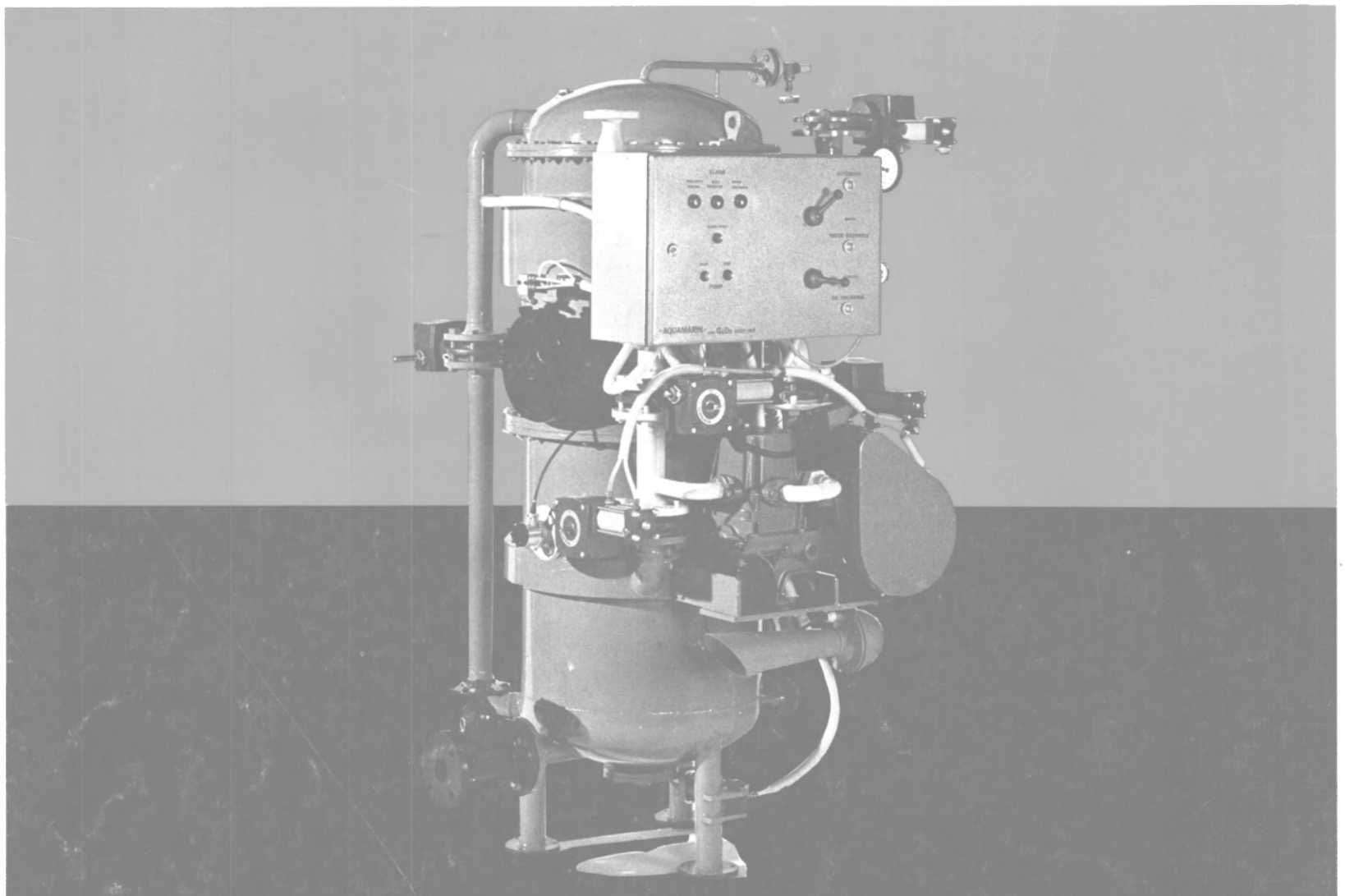

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