

MARITIME REPORTER

AND
ENGINEERING NEWS

DIESEL POWER REVIEW
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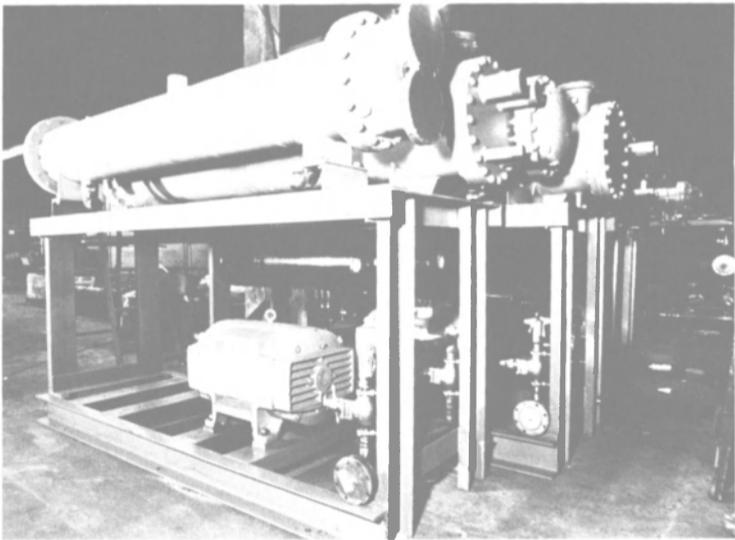
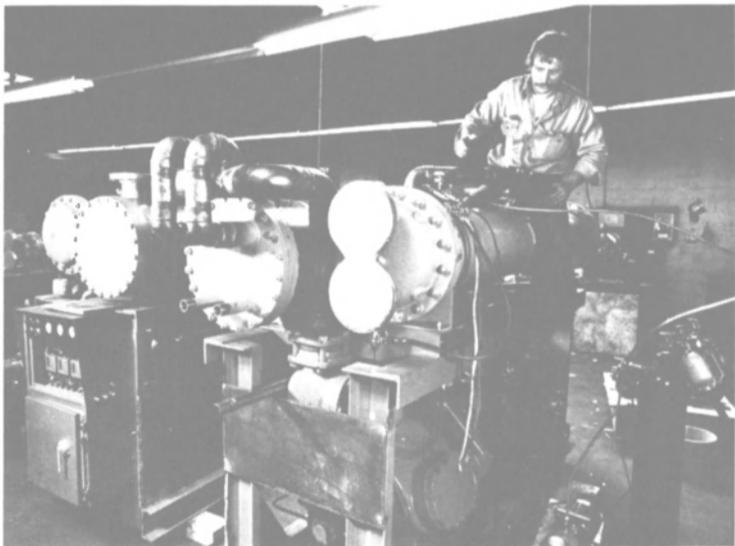
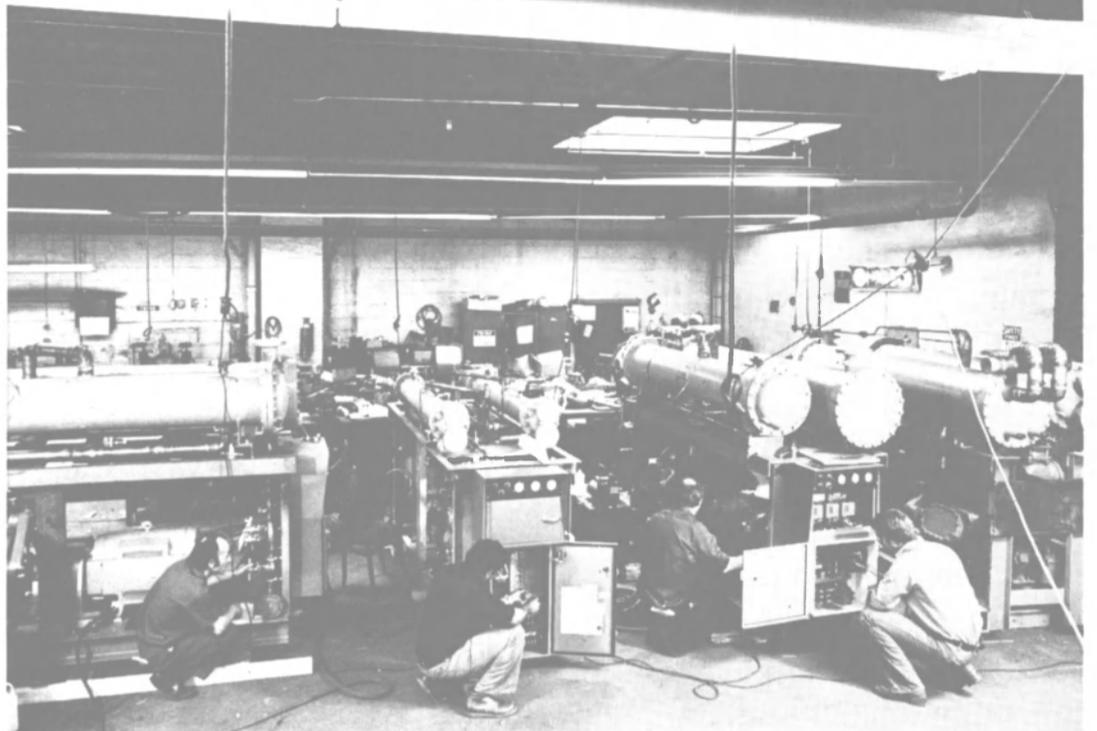
Johnson Chimsun Johnson Chemstar

**Kockums Christens
Two Chemical Tankers**
(SEE PAGE 10)

OCTOBER 15, 1980

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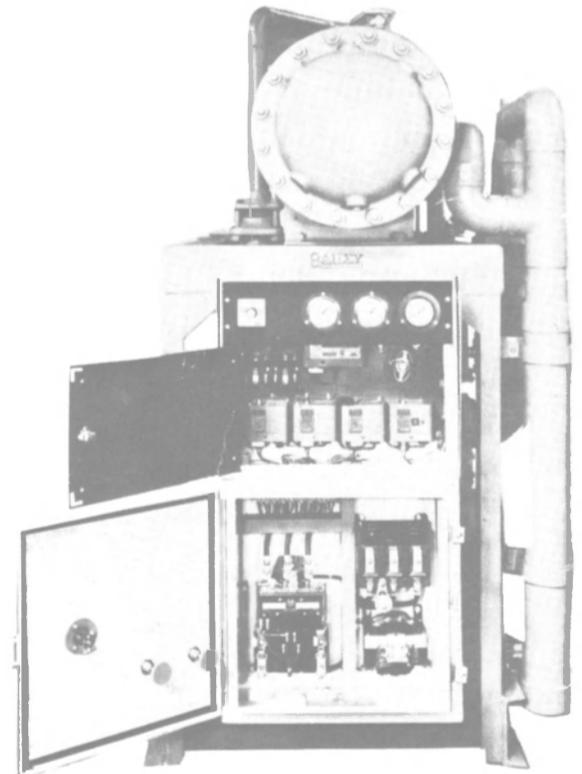
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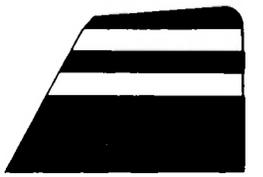
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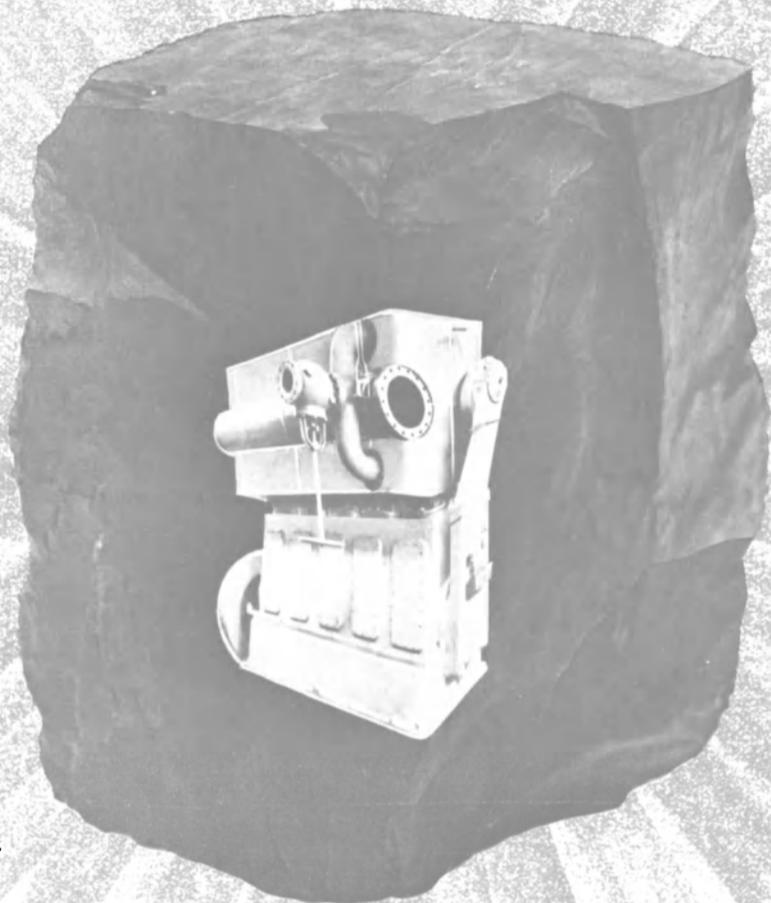
The largest tanker terminal in the world located at Ras Tanura, Saudi Arabia, needed a new dimension in shiphandling. McAllister, through its joint venture company, Saudi Tug Services, provided the expertise in the tug JABBAR.

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Promet Awarded Contract For Jackup Drill Rig By Saudi Arabian Owner

Promet Private Limited of Singapore, with the collaboration of Baker Marine Corporation of Ingleside, Texas, has announced receipt of a contract for the construction of a BMC 150 H class self-elevating, cantilever beam, mobile drilling platform from Arabian Drilling Company, Dammam, a Saudi Arabian corporation.

The drilling unit, 174 feet by 162 feet 6 inches by 18 feet, is intended to operate at a water depth up to 200 feet. It will have three independent, triangular truss legs each 300 feet long. The platform will be raised or lowered by means of Baker Marine rack and pinion, electrohydraulic jacking gear. Jacking speed will be 60 feet per hour, and total holding capacity in drilling position will be 10,800 short tons. The rig will have three-level quarters designed to accommodate 80 personnel.

The unit will be capable of drilling nine wells at any one location. It will be operated by Forex-Neptune of France in Saudi Arabian waters. Scheduled for delivery in November 1981, the rig will be built to American Bureau of Shipping classification +A1, Self-Elevating Platform.

University Of Michigan Annual Alumni Dinner Scheduled For Nov. 13

The Annual Dinner of the Naval Architecture and Marine Engineering Alumni of The University of Michigan will be held in New York City on Thursday, November 13, 1980 at the Cornell Club, 155 East 50th Street, between Lexington and Third Avenues. The reception will start at 6 p.m.

This dinner will take place during the Annual Meeting of The Society of Naval Architects and Marine Engineers on the night before the Society's Annual Banquet.

Those interested in obtaining tickets for the dinner should contact Lester Rosenblatt of M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013.

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As far as I'm concerned, they're *definitely the best* on the river.” That's what Floyd Goodman, Peavey's Director of Towboat Operations told us,



when we asked why they had specified St. Louis Ship.

The four 3800 HP Hydrodyne towboats are exact duplicates, measuring 140'x 38' x 10.5'. They were christened the M/V Frederick B. Wells, M/V Frank T. Heffelfinger, M/V Mary H. Morrison and M/V Frank H. Peavey.

They are used to push Peavey's fleet of over 200 covered hopper grain barges. St. Louis Ship would like to put its experience to work for you too. If you need a towboat, or if you are interested in knowing more about our Hydrodyne Hull design (built only by St. Louis Ship), call us at (314) 638-4000.



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Conrad Industries, Inc., located along 450 feet of Atchafalaya River frontage in Morgan City, La., has expanded its facilities to triple production. A new metal building (right) measuring 360 by 100 by 45 feet houses new barge construction, new drydock construction, and is equipped with three 10-ton overhead cranes, and welding and plate-bending machines.

Expansion At Conrad Industries Triples Barge Production Capacity

Conrad Industries, Inc., located on the Atchafalaya River in Morgan City, La., has completed an expansion program enabling the company to triple its barge production capacity. A new metal building 360 by 100 by 45 feet fronting on an added 150 feet of riverfront houses new barge construction, new drydock construction, three 10-ton overhead cranes, and welding and plate-bending machines.

The Conrad yard, founded in 1948 by Parker Conrad, now president and chairman of the board, features two tilt-cradle launching platforms, two 600-ton drydocks, one 800-ton drydock, a 1,500-ton drydock, one 40-ton crawler crane, one 50-ton crawler crane, three complete sandblasting units, and three 800-cfm air compressors. Employing 85 persons, Conrad Industries also operates complete maintenance and carpenter shops.

Reviewing more than three decades of the company's operations, James Court, vice president, said steel-hull barges have dominated production since 1964. Now building barges up to 200 feet in length and up to 75 feet wide, the privately owned company

spent 16 years building wooden-hull shrimp trawlers.

Other than the operations building, Conrad's expansion and renovation project included the paving of the entire yard, situated along 450 feet of riverfront. The totally paved yard, according to Mr. Court, eliminates mud and contributes to the company's commitment in developing "techniques, procedures, and accurate, swift, streamlined methods of building barges with remarkable cost efficiency."

As an example, Mr. Court pointed out, the company is geared with both personnel and equipment to build a deck barge 120 by 30 by 7 in a two-week period. Two of the key production personnel have been with the founder since the company began; joining Mr. Conrad at the time he purchased the company was J.C. Ratcliff, now yard superintendent, and L.J. Vicknair Jr., purchasing agent.

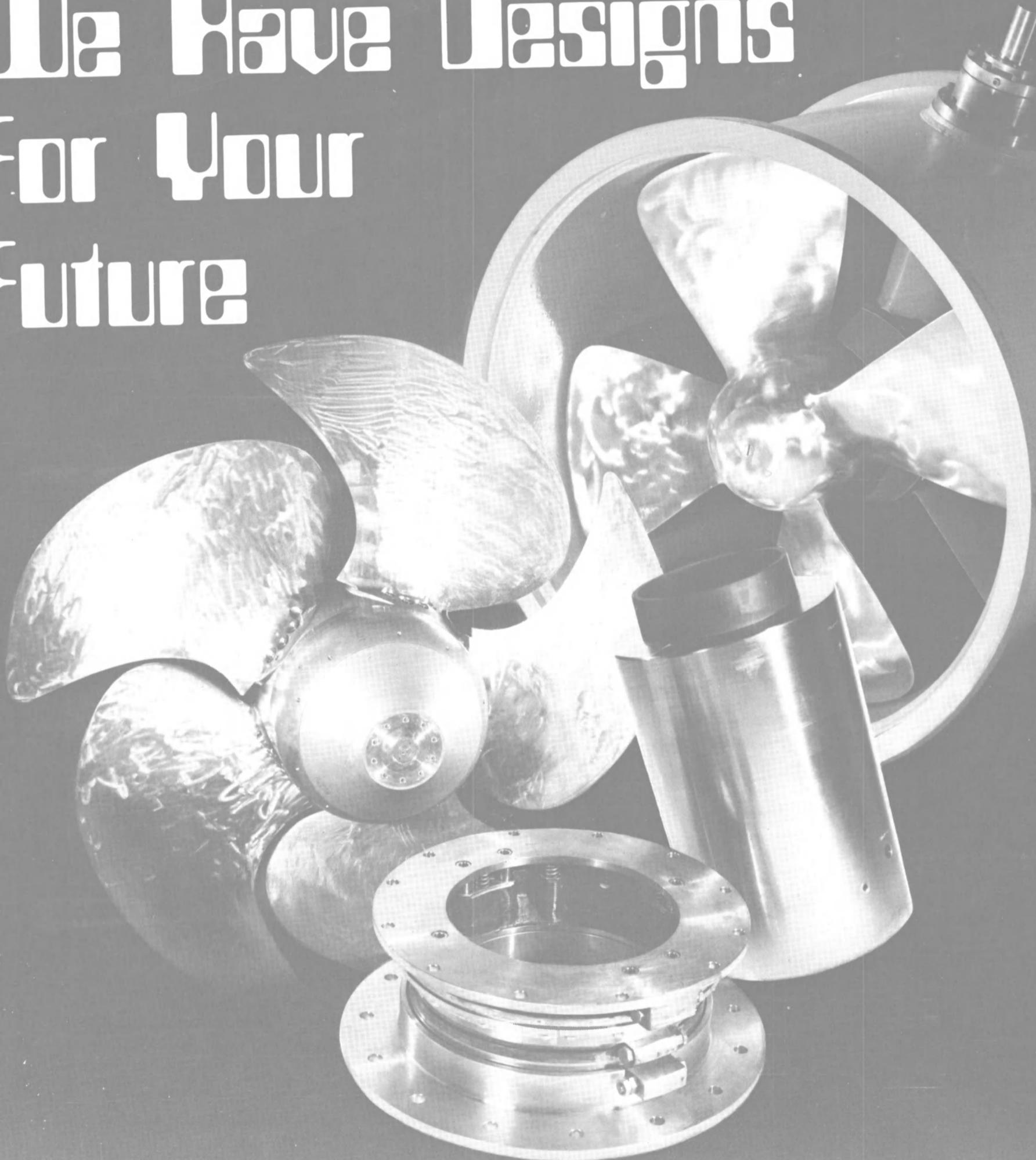
In addition to deck barges, Conrad Industries specializes in fuel, spud, and self-propelled barges. The company uses semi-automatic submerged arc welding techniques to cut production time.

Curtiss Wright Awarded \$13.7-Million Navy Contract For Landing Craft Engines

Curtiss Wright Corporation, Wood-Ridge, N.J., is being awarded a \$13,720,329 negotiated cost-

plus-fixed-fee contract for designing, developing, fabricating, and testing parts for stratified charge rotary combustion (SCRC-2350) engines for land/water vehicles for the Marine Corps. The Naval Sea Systems Command is the contracting activity. (N00024-80-C-5603)

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RSV Group Reorganized— Midland Marine Will Now Represent Verolme In U.S.

The Rhine-Schelde-Verolme Group of The Netherlands has announced that with the reorganization of Group activities there will be a change in the representation in the United States

previously carried out by Rhine-Schelde-Verolme (North America), Inc.

The VDSM Group (Verolme Botlek) consisting of Verolme Dock and Shipbuilding Company B.V. and Verolme Tankcleaning Company B.V. will be represented in the U.S. by Midland Marine Corporation, One Penn Plaza, New York, N.Y. 10119. **Martin A. Lan-**

geveld, formerly with Rhine-Schelde-Verolme (North America), Inc. and Verolme United Shipyards (North America), has joined Midland Marine with primary responsibility for the activities and interests of Verolme Botlek in the U.S. and Canada.

The combined management of Wilton-Fijenoord and Rotterdam Dockyard Company also an-

nounced the formation of Wilton-Rotterdam Dockyard Group, which will result in a closer coordination of the activities of these companies. This group will be represented in the U.S. by Ampower Corporation, One Marine Plaza, North Bergen, N.J. 07047, who represented Rotterdam Dockyard Company from 1959 to 1973. This activity will be carried out by **Robert H. Imlah**, vice president of Ampower, and **Frank R. McKenna**, who has handled the activities of Wilton-Fijenoord since 1965.

U.S. Coast Guard Approved Oil/Water Separators

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Under pending legislation all non-tanker vessels over 400 tons which ballast fuel tanks or have machinery spaces, will be required to have a U.S. Coast Guard approved 15 ppm (parts per million) oil/water separator on board to enter U.S. waters. Similar vessels under 400 tons have the added option of transferring oily bilge and ballast slops to a reception facility.

Less Than 2 ppm of Oil.

In recent U.S. Coast Guard certification tests, BUTTERWORTH® SFC BW (Separator Filter Coalescer-Bilge Water) units exceeded U.S.C.G. and IMCO A.393(X) requirements. In many tests, separated water discharges contained less than 2 ppm of oil. SFC BW units have also been approved in conformance with A.393(X) by Norway, France, Netherlands, Poland, Italy, Yugoslavia, United Kingdom, Greece and Germany.

Superior Vertical Processing.

SFC BW Oil/Water Separators are simple and rugged, with no internal moving parts. They operate at atmospheric pressure with minimum maintenance. Unlike some other separators, SFC BW units use vertical rather than horizontal processing. With an SFC BW unit, the oil/water mixture is first introduced into an upper

chamber where pure oil is immediately removed. The remaining oily water flows down along an outer shell, then upward past coalescing fins. Final cleansing occurs as the almost oil-free water is drawn through a flushable coalescer medium.

Unaffected by Pitch and Roll.

Unlike horizontal units, vertical processing SFC BW units occupy a minimum of deck space with all separation occurring in a single container. A 10 cubic meter per hour unit, for example, is only 4½ feet in diameter. SFC BW units can operate in almost any weather. They are virtually unaffected by pitch and roll.

unattended are also available.

Every SFC BW unit is equipped with a dedicated feed pump to allow SFC BW Separators to be sized to meet a vessel's exact needs. They do not have to rely on the vessel's bilge pump.

Recovered Oil Pay-back.

The value of the recovered oil, either returned directly to the ship's fuel tank or stored for reprocessing ashore, should not be overlooked. The pay-back period for SFC-BW Separators is continually being reduced as the price of oil rises.

Get All the Facts.

SFC BW Oil/Water Separators are available with capacities from ½ to 60 cubic meters per hour. Write or call for full details... and for a copy of "From A to X about Oil/Water Separators". This six-page report has facts on MARPOL, IMCO, and U.S. regulations for shipboard oil/water separators.

Other Features.

With SFC BW units, initial separation occurs at atmospheric pressure. The clean-water discharge pump creates a slight vacuum for final filter separation. As a result, SFC BW Oil/Water Separators do not clog or stop up. They can be located below the water-line with discharge elevations up to 30 meters.

A standard SFC BW unit operates unattended until a 20-minute filter backflush is required. The time between backflushes — usually 12 to 24 hours — depends on the degree of oil contamination.

Fully automatic units that operate completely



L.C. Meeks Promoted To Marketing Manager For Hydro Products

L. Charles Meeks Jr. has been promoted to marketing manager of Hydro Products, Inc. at its headquarters in San Diego. He will be responsible for achieving the company's new business objectives in the Commercial Products Division, and will direct the sales activities of the product line managers and the worldwide representative network.

Hydro Products, a wholly owned subsidiary of Tetra Tech, Inc., is engaged in developing, manufacturing, and marketing underwater television systems, illumination systems, instruments, and remote-controlled vehicles used primarily in the offshore oil, marine construction, and utility industries.

Clark Named Department General Manager At Tickle Engineering



Chris Clark

Chris Clark has been named general manager of the Marine and Machine Shop Departments of the Arthur Tickle Engineering Works, Brooklyn, N.Y. The announcement was made by J.T. Whitely, president of the corporation.

A 1965 graduate of the United States Merchant Marine Academy, Mr. Clark comes to his new position with 15 years of marine and machine shop experience.

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Kockums Christens Two Chemical Tankers For Swedish Owner

Two of the world's largest and most advanced chemical tankers were christened recently by Kockums at its yard in Malmo, Sweden. The twin 38,000-dwt vessels, called the Johnson Chemsun and Johnson Chemstar, will be delivered to Rederi AB Nordstjernan, Stockholm, following sea trials.

The diesel-powered vessels were built with 28 large stainless-steel center tanks and double bottoms

for ballast. Each ship contains a total of 38 separate tanks with self piping and pumping systems.

The two chemical tankers were the first ever built by Kockums and will be operated together with two new ships being built at Bergens Mek. Verksted, Norway, for J.O. Odfjell A/S, Norway.

The sponsors for the christening were Mrs. Frances Broman and Mrs. Christa Odfjell. Mrs.



Chemical tankers **Johnson Chemsun** and **Johnson Chemstar** were christened recently at Malmo yard of Kockums.

Broman is the daughter of **Bo Axel Johnson**, managing director of Rederi AB Nordstjernan, and

Mrs. Odfjell is the wife of **J.O. Odfjell**, chairman of the board, J.O. Odfjell A/S, Bergen, Norway.

Skinner Named Board Chairman Of National Waterways Conference



James A. Skinner Jr.

James A. Skinner Jr. of Nashville, president of Herbert Materials, Inc., has been installed as board chairman of the National Waterways Conference. He was elected at the organization's recent annual meeting in Tulsa to succeed **Lloyd E. Anderson**, executive director of the Port of Portland (Ore.) Commission. Mr. Skinner is also chairman of the Brick Institute of America, and vice chairman of the Tennessee-Tombigbee Waterway Development Authority.

His company, one of Tennessee's largest brick manufacturers, operates river terminals on both the Tennessee and Cumberland Rivers, including Herbert Marine Terminal at Nashville. A subsidiary, T.L. Herbert & Sons, Inc., owns a fleet of barges and towboats plying the Cumberland, Tennessee, Ohio, and Upper Mississippi Rivers.

Robert S. Kerr Jr. of Oklahoma City, president of Oklahoma Water, Inc., was reelected to another term as vice chairman of the NWC, and **Richard A. Wilson** of Sunset Hills, Mo., president of

Agri-Trans Corporation, was named to succeed Mr. Skinner as the Conference's first vice president.

Hudson Shipbuilders To Construct Two 70-Foot Towboats

Wendle Huddleston, president of Hudson Shipbuilders, Inc. (HUDSHIP), recently announced that HUDSHIP will build two 70-foot towboats for a major Mississippi River barge line.

The contracts for the two vessels were signed in September of this year in Pascagoula, Miss. These contracts represent HUDSHIP's continued vessel diversification into the inland towboat market.

These vessels are scheduled for delivery in February and March of 1981.

Surge In Requests For ABS Classification Reported At Mid-Year

The American Bureau of Shipping (ABS) received a "sizeable increase" in requests for the classification of ships and other marine structures during the first half of 1980, **William N. Johnston**, chairman and president, reported at the semiannual meeting of the Board of Managers held in New York City recently.

Mr. Johnston said that as of July 1, there were 1,829 vessels on order to ABS classification in 42 countries, totaling 11,289,000 gross tons or 17,112,000 deadweight tons. This is a 14-percent increase over mid-1979.

The chairman cited three factors as contributing to the gain

in requests for classification: shifting conditions in the oil markets last year that have led to a rise in orders for crude oil and refined petroleum product carriers primarily of 100,000 and less deadweight tons; improvements in the coal, iron ore, and grain trades that have led to more orders for bulk carriers; and the expanded worldwide search for, and development of, offshore energy sources, that have led to increased orders for offshore mobile drilling units.

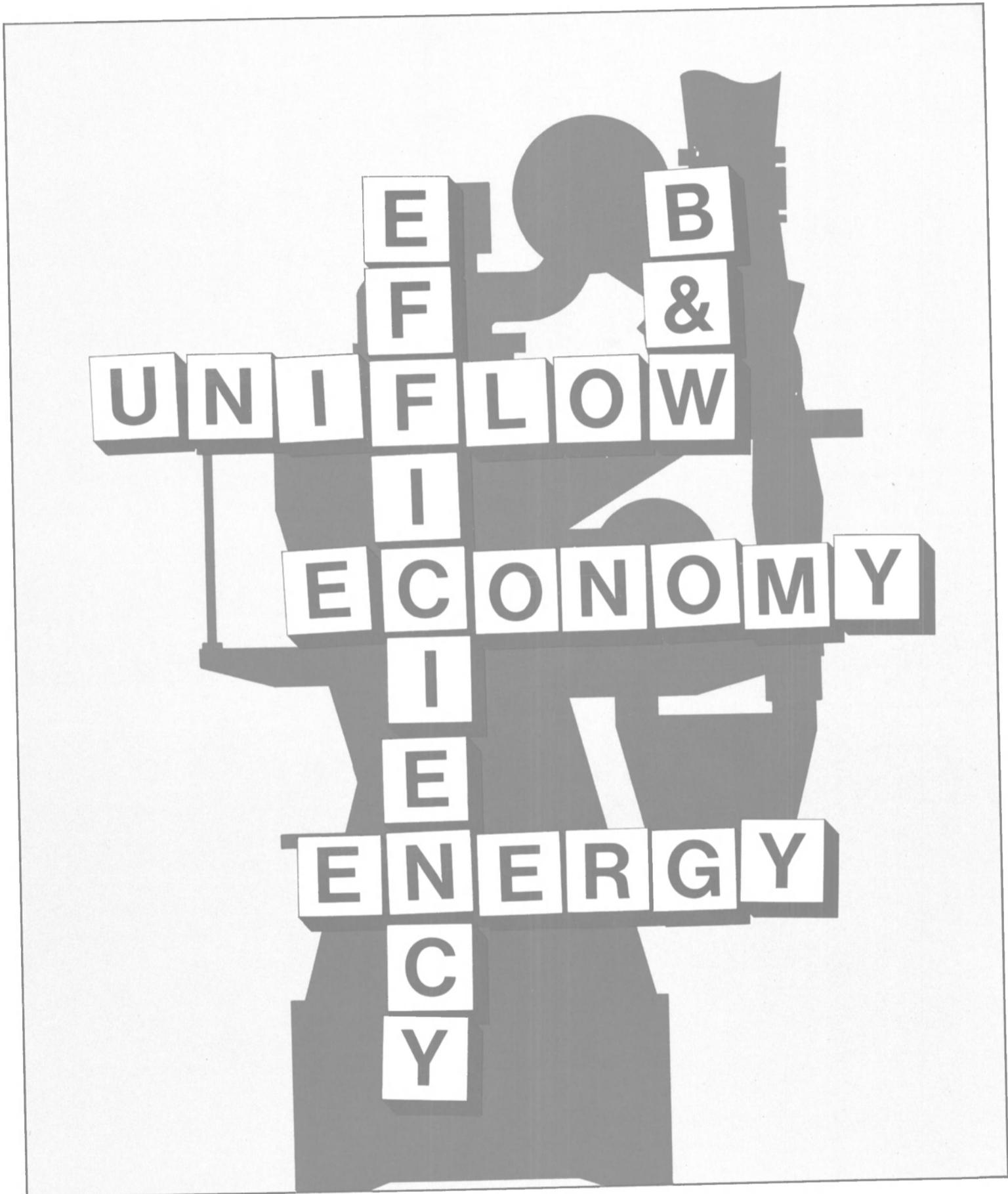
Regarding ABS subsidiaries, Mr. Johnston reported that ABS

Worldwide Technical Services, Inc. is continuing to expand its third-party assurance, inspection, and certification services, particularly in Brazil, Singapore, and Venezuela. He said EXAM Company, one of the major organizations providing non-destructive testing services to the U.S. pipeline industry, has been very busy during the first half of 1980. "This is due to the acquisition of equipment in 1979 that placed EXAM in an excellent position to service the expanding activities of the domestic energy distribution industry."



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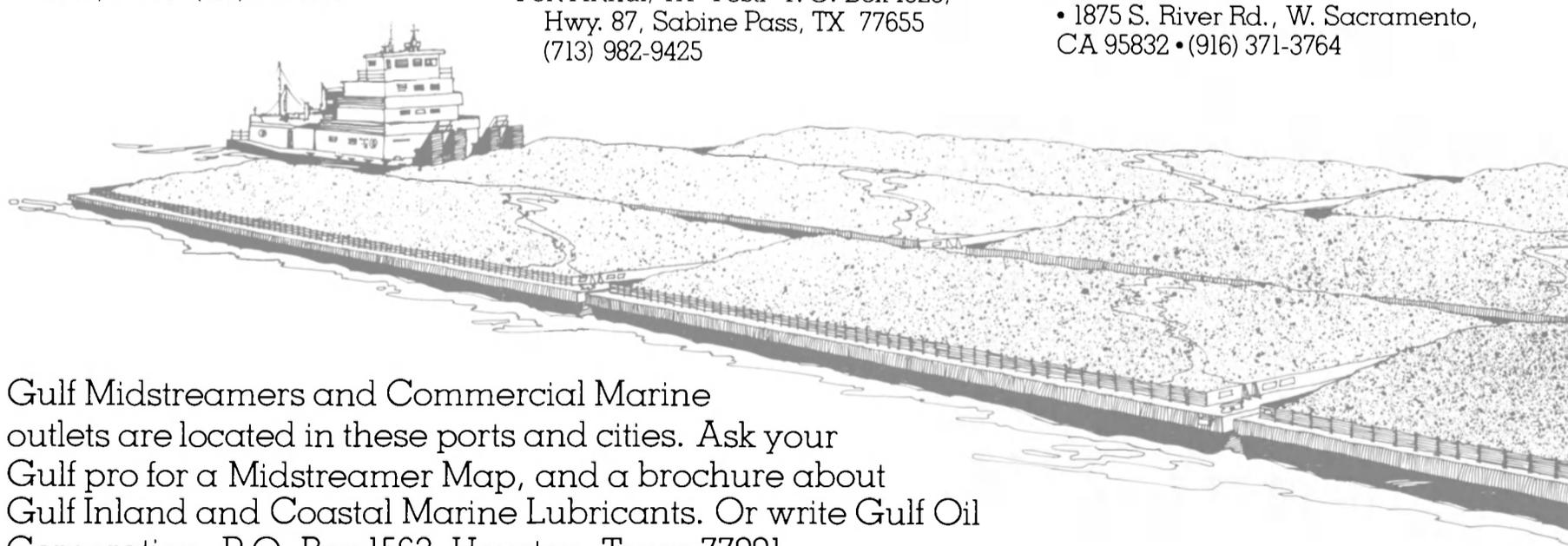
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St. Paul, MN • Gopher Oil Co. • 2500
Delaware Ave., S.E., Minneapolis,
MN 55414 • (612) 331-5936

Dubuque, IA • Iowa Oil Co. • P.O. Box
712, 52001 • (319) 583-3563

Moline, IL • BRU-SUN Co., Inc. • 6600
John Deere Rd., 61265 • (309) 796-0123

Wood River, IL • Economy Boat Store
Company • 301 Penning Ave., 62095
(618) 254-4333

St. Louis, MO • Kiesel Marine Service,
Inc. • 1717 Park Ave., 63104
(314) 241-6850

Cape Girardeau, MO • Rhodes Oil Co.
• P.O. Box 557, 63701 • (314) 334-7733

Memphis, TN • Economy Boat Store
• Foot of Illinois Ave., 38106
(901) 775-3131 • KXE-302 Channel 11

Memphis, TN • Waterways Marine, Inc.
• Foot of Beale St., 38103
(901) 522-5761 • KJC-771 Channel 16

Helena, AR • Helena Marine Service,
Inc. • P.O. Box 428, 72342
(501) 338-8765 & 338-8508 Day
338-8765 Night • KLG-287

Greenville, MS • Waterways Marine of
Greenville, Inc. • P.O. Box 1378,
Warfield Point Greenville, MS 38701
(601) 335-2526 • KWS-617

Vicksburg, MS • Channel Fueling
Serv., Inc. • Mile 437, 39180
(601) 636-4814

Baton Rouge, LA • Channel Fueling
Serv., Inc. • P.O. Box 3142, 70821
(504) 383-4691

Port Allen, LA • Tri-State Marine
Services, Inc. • P.O. Box 109, 70767
(504) 749-3171 • KAK-216

Gretna, LA • John W. Stone • 87 First
Street, 70053 • (504) 366-3401 &
361-3396 • KGW-352

New Orleans, LA • Channel Fueling
Serv., Inc. • (504) 368-1416

New Orleans, LA • Gulf Outlet Fuel &
Marine Supplies, Inc. • P.O. Box
26005, 70186 • (504) 241-8680 • KVF-893

Venice, LA • Petroleum Products of
Delaware • P.O. Box 73183, 70091
(504) 455-2077 (Metairie)
534-7544 (Venice)

Ohio River

Pittsburgh, PA • Gulf Oil Co. • 300 Penn
Center Blvd., 15235 • (412) 824-9900

Ludlow, KY • Columbia Marine
Service, Inc. • P.O. Box 16107, 41106
(606) 431-4450

Louisville, KY • Wooten River Service &
Supply Co. • P.O. Box 6686, 40206
(502) 896-0317 • KDO-737

Rockport, IN • M & P Contract Co. • P.O.
Box 47, 47635 • (812) 649-2191

Paducah, KY • Molloy Marine Service,
Inc. • 1136 S. 3rd, 42001
(502) 443-6456 • KRS-857 Channel 16

Paducah, KY • Walker Midstream
Service • 532 S. 2nd, 42001
(502) 442-0925 & 442-2738 • KEW-827
Channel 16

Illinois River

Chicago, IL

Lockport, IL

Joliet, IL

CHC Supply, Inc. • 120 Fairbank St.,
Addison, IL 60101 • (312) 543-2255

Peoria, IL • Midwest Oil Co. • 1245 W.
Washington, East Peoria, IL 61611
(309) 694-3413

Missouri River

Council Bluffs, IA • Oil Products Co.,
Inc. • 101 S. 18th St., 51501
(712) 322-8555

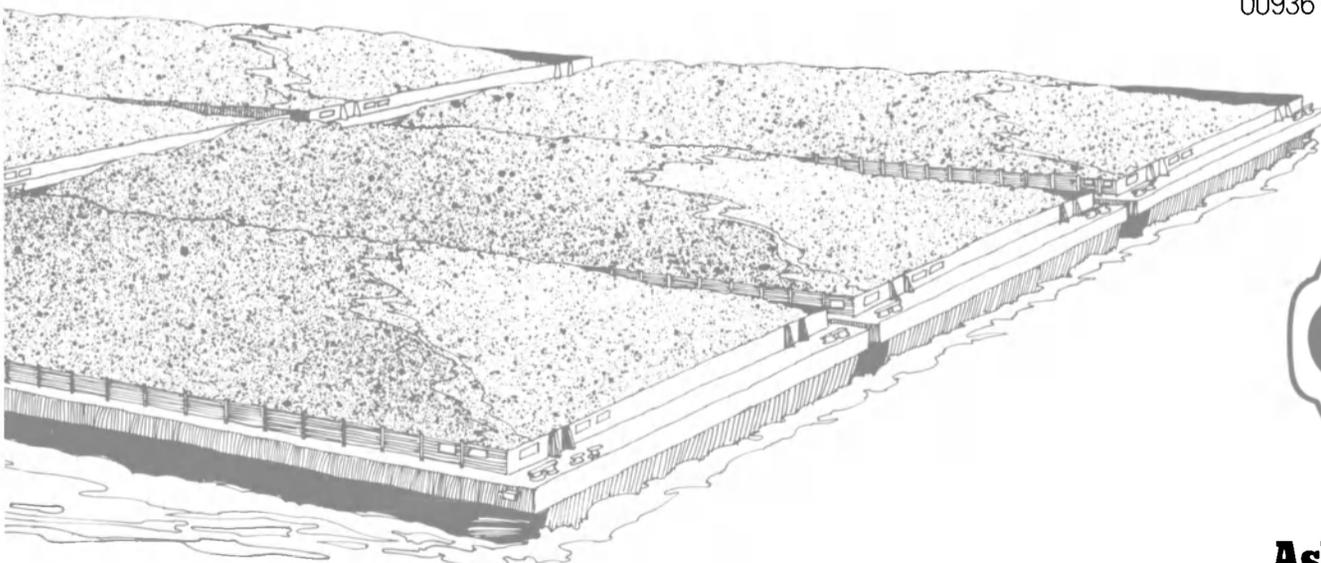
Kansas City, KS • Sam Dunn Oil Co.,
Inc. • 1270 Southwest Blvd., 66102
(913) 432-6606

Arkansas River

Pine Bluff, AR • ATCO, Inc. • P.O. Box
7111, 71611 • (501) 535-6464 Day
534-0201 • 536-6535 Night
Channel 16

Puerto Rico

San Juan, PR • Mr. Louis Polanco • Gulf
Petroleum S. A. • P.O. Box 4049,
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Ask the pro from Gulf.

DIESEL POWER REVIEW

Latest Developments In Fuel-Efficient Engines For The World's Merchant Fleets



While fuel costs continue on their upward spiral, and fuel quality continues to decline, the manufacturers of marine diesels have been busy designing new engine types and redesigning older model lines. Some companies have produced totally new designs; others have made design improvements to their proven lines. All have a common goal: to improve fuel efficiency even while burning lower quality residuals, and to reduce maintenance costs.

We asked the major diesel manufacturers to tell us about their latest developments; this review is based on their replies.

Alco Power Inc.

The Power Boss™ is what this Auburn, N.Y., engine manufacturer calls its diesel. This four-cycle engine is offered in a power range from an 800-bhp, 6-cylinder in-line to a 4,500-bhp V-18. All have the same bore and stroke, and use the same operating principles. With normal maintenance, states Alco, the Power Boss can consistently operate 25,000 hours or more between major overhauls.

The 1,200-rpm Power Boss is part of Alco's continuing development program of putting more power into less space. A 12-cylinder, 1,200-rpm unit is said to provide 16-cylinder performance

in specific applications. The 1,200-rpm units are built as an in-line 6, V-12, and V-16 engines. These diesels offer particular advantages in marine and generator applications. In marine applications, reduction of engine space and weight permit greater fuel storage and therefore better cruising range. When the engine is used in a generator set, a less expensive generator is required.

Four-point mounting, with feet located at the nodes of vibration, is common to all Alco engines. The rear mounts are firmly anchored while the two front mounts can float longitudinally on their hardened steel plates, allowing for expansion. The four-point mounting also reduces the cost of foundations. The Power Boss can be shipped completely packaged with its driven equipment and accessories in a skid-mounted arrangement that can merely be set down in a level area for operation.

Generators and turbochargers match the capabilities and characteristics of the engine. The generator, ac or dc, is often of cantilever design mounted directly on the engine with no flexible coupling. As there is no separate generator support, the possibility of misalignment or distortion is minimized, an important factor in marine units.

Because the basic design of the Power Boss remains much the same, Alco has always been able to improve the engine by standardizing and upgrading components, utilizing new materials and technologies. Standardization also allows Alco to take advantage of new production techniques to establish more precise tolerances, which in turn make new, more efficient components interchangeable with previous parts used in older engines. As a result, even old Alco engines can be upgraded and improved.

Alco's ongoing program to increase production and reduce costs has resulted in the recent addition of more than \$3.5 million in new machinery and facilities at its Auburn plant. Plans call for additional expenditures of \$32 million over the next five years.

The recently acquired machinery includes an automatic internal grinder that uses a valenite elec-

tronic column gauge system, and a dual-turret, 16-inch turning center with acramatic 5-tape control. Also added was a semi-automatic cam grinder with electronic wheel feed system and automatic wheel truing device, and a dual-turret, 4-axis turning center with CNC tape control that features completely independent motion of each turret.

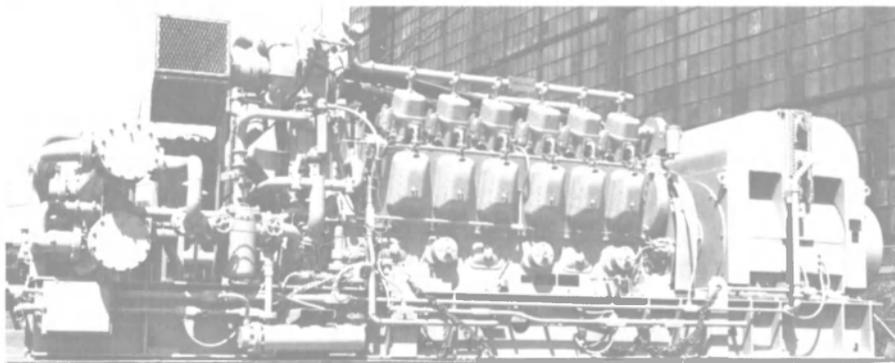
All this is part of Alco's plan to incorporate the most modern features of production technology in the manufacture of its diesel engines.

Allis-Chalmers

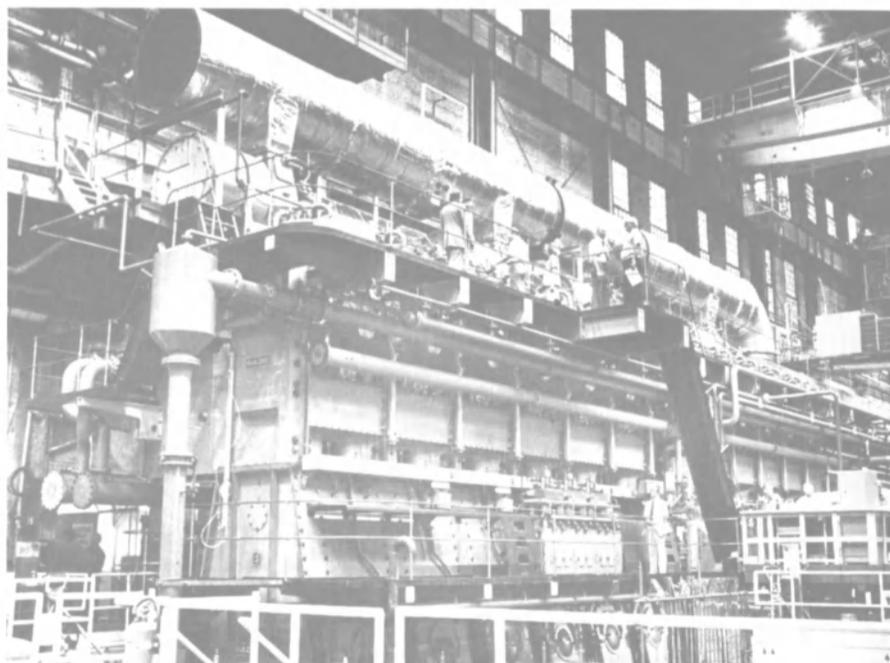
The first modern low-speed diesel engine for an oceangoing ship to be built in the United States has been completed and is under test at the Allis-Chalmers Corporation plant in Milwaukee.

In anticipation of future low-speed diesel business, Allis-Chal-

(continued on page 16)



12-cylinder generator set built by Alco produces 2,000 kw at 1,200 rpm.



First Allis-Chalmers/Sulzer low-speed engine on test stand at A-C plant in Milwaukee.



Marine bodyguards.

Our aluminum anodes offer predictable offshore performance.

Controlled rate of corrosion, a Kaiser Chemicals technological breakthrough, enables designers to predict performance and life of aluminum marine anodes KA90 and KA95 with a high degree of success.

Why two alloys? To give you a choice. KA90, Al-Zn-Sn type (without mercury) is tested to have an average current output of 1176 amp-hours/pound. Voltages range from 1.07v to 1.15v. Or KA95, Al-Zn-Hg type (with mercury), tested to have an average current output of 1285 amp-hours/pound and a voltage of over 1.05v.

Both KA90 and KA95 aluminum marine

anodes are available in sizes up to 1,100 pounds from a 10,000,000-pound/year manufacturing facility designed exclusively for anode production. And every heat must qualify for acceptance by going through our Q-7 seven-point quality-control program.



Get our 20-page brochure which includes an anode-selection nomograph and other important design data. Write Kaiser Chemicals, 300 Lakeside Drive, Oakland, CA 94643, Room 1139 KB. Or call (415) 271-5580.

KAISER
CHEMICALS
TULSA METAL PRODUCTS

Diesel Power Review

(continued from page 14)

mers recently established a Marine Diesel Division. "The step was considered essential in establishing Allis-Chalmers as a supplier of low-speed diesel engines for marine and stationary power applications. Negotiations on the construction of new units are under way," said **John R. Mills**, gen-

eral manager of the Marine Diesel Division.

The first diesel on the test bed is a Sulzer 12 RND 90M type—a single-acting, two-stroke cross-head engine with constant-pressure turbocharging. It has a rating of 43,200 bhp at 126 rpm, weighs 1,160 tons, and is 82 feet long, 36 feet high, and a maximum of 14 feet wide.

This engine is the first of three to be built by Allis-Chalmers un-

der an agreement with Sulzer Brothers, Ltd. of Switzerland as main propulsion units for three containerships under construction at Avondale Shipyards for American President Lines. These three vessels, the biggest containerships ever built in the United States, will be used in trans-Pacific trade when they are delivered in 1982.

"For Allis-Chalmers, this contract means some 50,000 man-

hours of work over a 14-month period," Mr. Mills said. "The first engine is scheduled to be shipped in the fourth quarter of this year. The second and third engines are scheduled to be finished in the first and second quarters of 1981, respectively."

Major components built by Allis-Chalmers are the massive, two-piece bedplates that form the foundation of each engine; the thrust housing, which supports the end of the crankshaft; the columns that support the cylinder assemblies; the air receiving chambers; and the 28 tie-rods that hold a completed engine together. For the third engine, Allis-Chalmers will manufacture the piston connecting rods. Other major components are supplied by Sulzer.

According to Mr. Mills, the U.S. Maritime Administration has recognized that one answer to the rising cost of marine fuel was to encourage development of a low-speed diesel industry in the U.S. In the total absence of this industry, however, MarAd waived its "buy American" rule to qualify for Federal shipbuilding subsidy. This attracted leading marine diesel manufacturers, who sought to meet MarAd requirements by arranging to have their engines built in the U.S. by American companies.

"Shipowners also are eager to benefit by the fuel-saving design of the low-speed diesels," Mr. Mills said. "American President Lines placed the first order for such diesels, giving the contract to Sulzer, which in turn entered into a manufacturing agreement with Allis-Chalmers. The Milwaukee company thus becomes the first American manufacturer to actually build such engines."

APL hopes to save about \$2 million in fuel costs per ship each year. Elsewhere in the world, some 23,000 oceangoing ships are benefiting from the lower costs of fuel-efficient diesel engines.

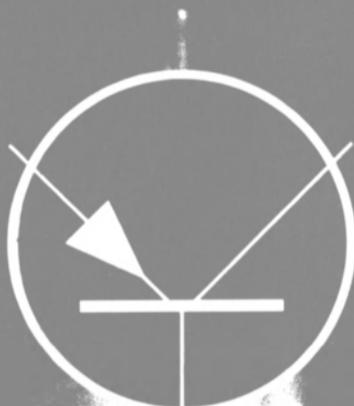
American Brons Diesel

American Brons engines are manufactured in the U.S. under license from Brons Industrie of the Netherlands at the facilities of Marine Engineering, Incorporated in Belle Chasse, La. Brons diesels have a reputation for high reliability and low maintenance costs. In the United States, they are installed in offshore tugboats, tug/supply vessels, and inland pushboats.

Oosterhuis Industries, Inc. of New Orleans is the U.S. marketing representative for American Brons engines, which are available in the TD and GV series, both lower rpm type, two-stroke diesels. The TD (turbo-diesel) series of engines have a bore of 220 mm, stroke of 380 mm, and a power range from 1,200 to 4,000 bhp (895-2,983 kw).

The turbodiesel design is based (continued on page 18)

Electronic Injection



Optimal Injection
That is:

Variable point, duration and pressure of injection with constant-pressure injection and BOSCH microprocessor technology.

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Low consumption, ability to burn low-grade fuels, excellent manoeuvring characteristics, dead slow speed of one-sixth rated speed, clean exhaust.

M.A.N. Diesel Engines, D-8900 Augsburg 1

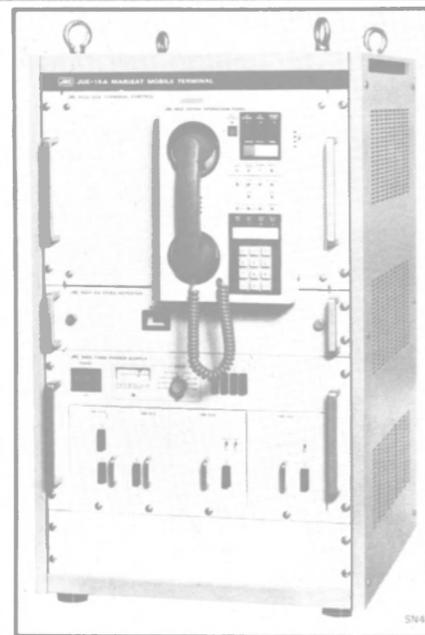
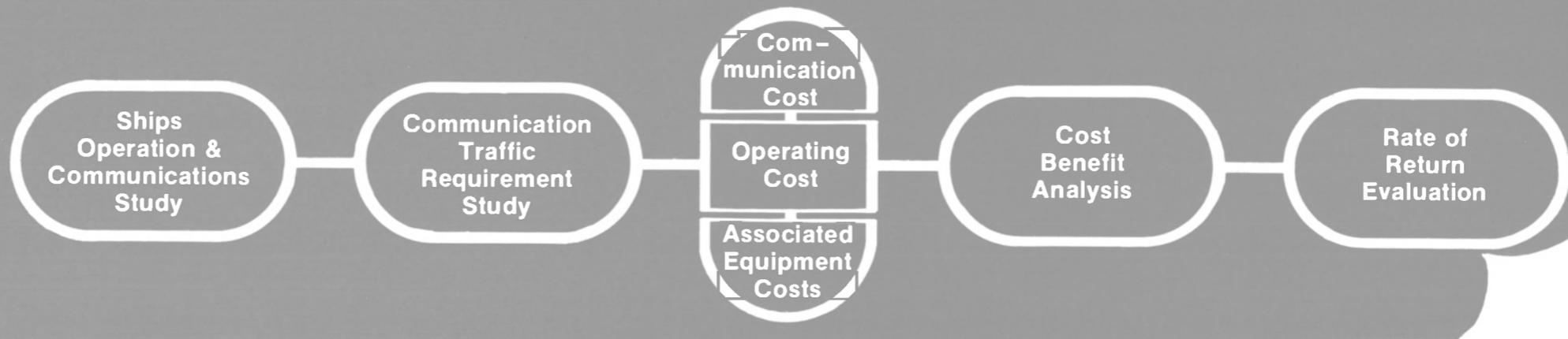
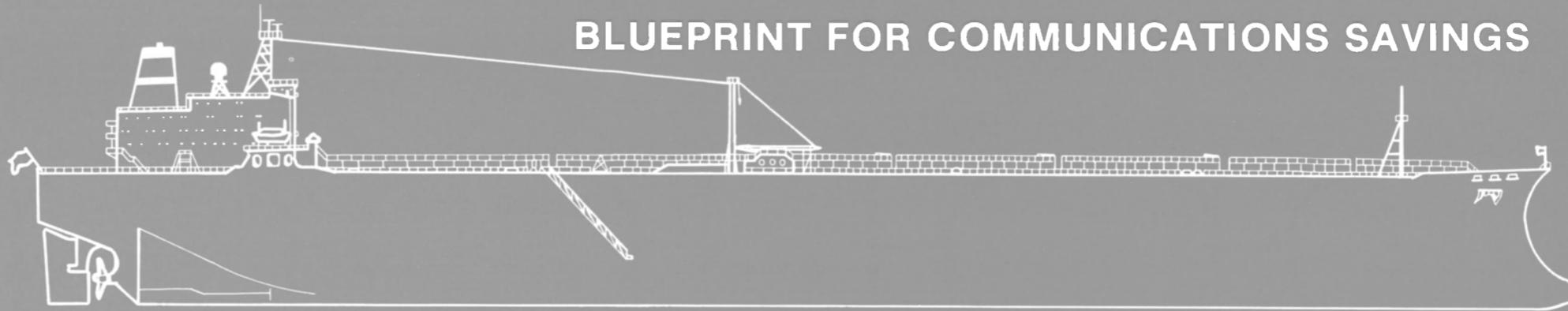
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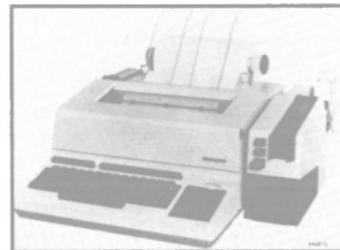
BLUEPRINT FOR COMMUNICATIONS SAVINGS

The Above Deck Equipment (ADE) consists of a 1.2 meter micro-wave antenna, stabilized against ship movement, (transmitter and receiver), and contained in a 1.69 meter diameter fiberglass radome. The whole ADE is designed and rigorously tested for severe marine environment conditions.

The Below Deck Equipment (BDE) has micro-processor capabilities, and is designed for flexible upgrading with any number of options. The modular units can be easily installed in congested radio rooms, and its electronic teleprinter is considered the most reliable marine-rated teleprinter available.



The JRC JUE-15A maritime satellite communications terminal continues a tradition of providing high performance and high reliability marine electronic equipment incorporating the latest technological advances. With the JUE-15A, the shipowner is assured of obtaining the latest equipment available, simple to install and operate, and capable of achieving the full communication capabilities of the maritime satellite communication systems available now, or in the future.



The JRC JUE-15A uses the same proven design and quality control production techniques of its predecessor, the JUE-5A, with improvements in performance and design features for further reliability, easier installation, operation, and maintenance.

The JRC JUE-15A satellite terminal meets the cost-benefit model through newer technology, at a lower initial investment cost and installation savings. Reduced maintenance costs from

long-term reliability and an effective world-wide service support network reduce the drain on future funds. The JRC JUE-15A terminal provides full system flexibility to provide basic telex, voice, facsimile, and data circuits and future expansion into direct real-time computer-to-computer circuits, with options available for full remote control, automatic follow on, message security storage, automatic reporting systems, and complete Fleet Data Systems. The JRC JUE-15A provides the basic building block that can be easily integrated into your corporate management and communications planning for the future.

MARITEL can conduct a "Cost Benefit Analysis" for your company, using your figures and your mode of operations, or we can provide a procedure for your own internal analysis. With today's requirements for budget control, a realizable rate-of-return on investment must be shown to achieve a positive bottom line. With MARITEL's equipment and in-house experience, we can show you how the JRC JUE-15A satellite terminal can prove to be one of the most cost-beneficial investments a shipowner can make for the future.

The JRC JUE-15A is in full production, and available for quick delivery to meet your fitting schedule.

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Inc.

Diesel Power Review

(continued from page 16)

on customer demands for low fuel consumption, simple maintenance, and long parts life. The design incorporates almost 75 years of experience at Brons Industrie in building reliable diesels.

The first turbodiesels shop-tested at the Belle Chasse plant were introduced to the industry in February 1978. They are installed in a twin-screw tug/supply vessel operating in the Gulf of Mexico. To date these engines have logged approximately 6,000 hours to the full satisfaction of the owner. After the 6,000 hours of operation, cylinder liner readings indicated no practical measurable wear. Fuel-oil consumption and use of lube oil continue to be most satisfactory, and confirm readings obtained earlier on the test bed. TD engines are presently in production for late 1980 and early 1981 deliveries.

The Brons GV series have a bore of 220 mm and stroke of 380 mm, with continuous output from 750 to 2,000 bhp at 375 rpm operating on No. 2 diesel fuel. These engines are available in 6-, 8-, 12-, and 16-cylinder V type configuration, and were introduced in the United States in 1972.

Vessel operators, particularly of offshore tugboats, quickly recognized the economics offered by the GV engines; a sizable number are presently in operation for U.S.

owners. The first GV engines installed have logged approximately 50,000 hours; no engine repairs of significance have been carried out, and recent inspection of bearings and liners showed only limited wear.

During 1980, orders for GV engines have been mainly for push-boat propulsion, a trend that appears to continue. Several GV diesels have been installed in fishing vessels operating in Icelandic waters using lower quality, higher viscosity fuel. Should the use of other than No. 2 diesel be required, however, the Brons factory should be consulted.

B&W Diesel, Inc.

This is the year in which the reliable and highly efficient, low-speed diesel engines of the latest B&W design finally made their long-awaited order breakthrough on the world market.

Operators all over the world, responding to the ever-increasing cost of fuel and lubricating oils, are realizing that it pays to invest in B&W engines, with their inherent flexibility and overall operating efficiency. Both of these features are contributing towards maximizing the return on investment, especially considering the complex economics and the volatile nature of the maritime transportation system.

The B&W engine types that have so successfully accommodated the wishes of shipowners and operators consist of five long-stroke and four short-stroke en-

gines, ranging from 4 to 12 cylinders, with mcr ranging from 985 to 3,945 bhp. The high thermal efficiency of this engine type, the GFCA design, provides specific fuel consumption ranging from 136 to 143 grams per bhp hour at maximum continuous rating, and from 131 to 138 g/bhph when the engine is operated at 85 percent of normal mean effective pressure. The latter figures will be guaranteed.

The GFCA diesel engine program provides the designers and operators with a unique choice, based on the following factors:

The basic design dates from the beginning of the seventies and is therefore founded on extensive service experience with about nine million bhp in service.

The design is based on the uniflow scavenging principle, which, with all other parameters being equal, is able to perform with the lowest specific fuel oil and lube oil consumption.

The design gives the operator the possibility of burning the lowest grades of fuel commercially available. It allows a large stroke/bore ratio, thus giving low propeller revolutions and good propulsion. And the design permits safe operation for longer periods of time at low load, as the combustion is clean and the risk of explosions in the exhaust gas receiver is non-existent.

A very important point when discussing the future of the low-speed diesel engine is that of

development potential. Here the B&W uniflow design provides unique and interesting possibilities.

The current engines are achieving the low consumptions at relatively low maximum cylinder pressure (89 bar). Hence the aim for the immediate future will be to benefit from this situation, first by raising the maximum pressure in the cylinder to 105 bar, thus further increasing the thermal efficiency. The resulting engine type, the GFCA, could be marketed within the next two years.

The next step will be to further raise the maximum pressure, and although this will require more radical design changes, B&W will use this opportunity to introduce some engine components that have been developed and optimized in recent years.

All this will be aimed at giving the customers a simple, more efficient engine that will be able to meet their requirements for the engine as a reliable money maker now and in the future, when the fuel oil scenario is going to be one of deteriorating marine fossil fuels and commercially available alternative fuels such as coal liquids.

Caterpillar Tractor Company

Marine engines manufactured by Caterpillar provide continuous propulsion power ratings ranging from 375 bhp on the D353 model

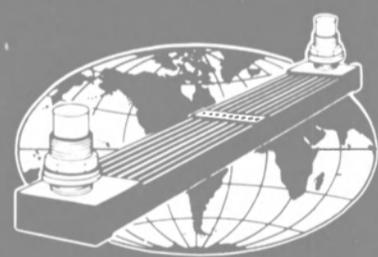
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ENGINE AND KEEL COOLING



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The best combination of reliability and overall economy—it's the simple design.

Profit from our standards— worldwide

Sulzer engines are built in many places, but all precisely to the same specifications. This world-wide standardization means the spare parts are fully interchangeable and therefore easy to obtain.

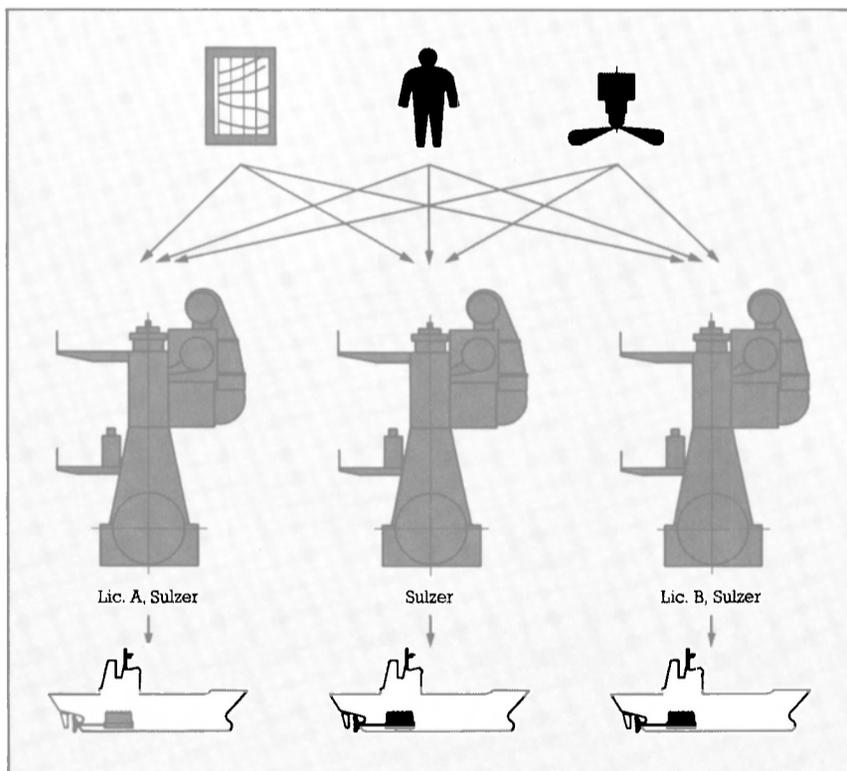
Sulzer's own complete stocks of spares are held at 19 keypoints along the world's shipping routes.

Computerized spares management means higher speed and thus lowering the off-hire costs. And round the world, round the clock, Sulzer service engineers are ready to move. With the aim of keeping the engine running. But the Sulzer world-wide service offers more. It starts right from the initial stage with project

consulting for the complete propulsion installation, and continues throughout the lifetime of the system.

The accumulated experience of more than 4000 "R" slow-speed engines in operation is passed on to your crew with practical work on engines and simulators in our training centre. Thus, your crew—familiarized with machine and system—works better and assures a perfect running of the engine.

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Telex 76165



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Diesel Power Review

(continued from page 18)

to 1,125 for the D399 line. Auxiliary generator sets are rated from 250 kw to 800 kw.

The big engines in the Caterpillar marine family are the D399 V16 and the D398 V12, both turbocharged/aftercooled models with the same bore/stroke of 6.25/8.0 inches. These two types, along with the D379 and D353 engines, have proven capable and reliable in thousands of marine applications around the world.

The rugged four-cycle design and medium operating speeds of the Cat marine engines result in outstanding reliability and long service life. Their compact size insures ease of installation and servicing even when machinery spaces are at a premium.

For application flexibility, V models offer right- or left-hand rotation, full power from either end, and accessories located on either side. Watershielded turbocharger and watercooled exhaust manifolds protect against fire hazards and reduce engine room temperature. The no-adjustment fuel system keeps full rated power and good fuel economy without periodic adjustment.

Worldwide, thousands of Caterpillar 7200 Series marine transmissions are hard at work in applications ranging from 300 to 1,125 hp continuous operation. Their value is attested to by operators and owners of river pushboats, fishing vessels, offshore supply and crewboats, oceangoing tugs, workboats, and utility vessels.

The 7200 Series is designed for specific Cat diesel engines, insuring matched propulsion packages for ease of installation and maximum operational efficiency.

Colt Industries

Fairbanks Morse Engine Division of Colt Industries is benefiting from the strong current demand for marine diesel engines. The division produces its well-known 38D8¹/₈ series opposed-piston diesel in a range up to 4,200 bhp. The larger Colt/Pielstick PC2 series is manufactured in the division's Beloit, Wisc. headquarters, and is offered in a range from 6,000 to 11,700 bhp.

Colt Pielstick engines built by Fairbanks Morse range up to 4,200 bhp.

In addition, Fairbanks has sales rights for the much larger Pielstick PC4 diesels with ratings up to 27,000 bhp.

According to W.T. Hailey, vice president-sales, the division's marine activities during the past year were highlighted by three applications. The first was the three breakbulk/reefer/container vessels built by Equitable Shipyards for American Atlantic Ship-

ping, Inc. Each vessel is powered by a 12-cylinder Fairbanks Morse opposed-piston diesel with a 3,000 bhp rating. Said to be the most technologically advanced vessels of their size in the American-flag merchant fleet, two of them have been delivered, with the third scheduled for completion by the end of this year.

A second important application for FM-built engines was the three

twin-screw tug/barge units being built by Avondale Shipyards for Occidental Petroleum. Each ship-set consists of two Colt/Pielstick 14-cylinder, PC2.5 direct-reversing diesel engines, each driving a single input/output reduction gear. The tug and barge lock together, forming a rigid connection between the stern of the barge and the twin hulls of the catamaran tug. Each vessel will

Tropic Super Tropic

Recommended for ships trading between unpolluted, cold to subtropical ports. Applied in a dry film thickness of 50 microns they will give protection for a period of 8-12 months. They give an increased roughening during service and the resulting paint film is porous and weak. At dry-docking this film should preferably be removed because it will always be the weakest part in the system. Especially when a vessel alternatively visits saltwater and freshwater ports flaking can occur due to the different absorption between fresh and salt water. In practice, however, this is impossible and therefore a sealing primer must always be used before a new antifouling coat is applied.

For ships calling regularly in very foul tropical or subtropical ports, modern, highgrade antifouling should be selected. The demand to maintain speed over a long period can only be met by the very best high build antifouling available.

In this range we have developed some special antifouling:

- CHLORINATED RUBBER A/F
- SARGASSO C. R.
- SARGASSO C. R. JAPAN
- SEVEN SEAS

Chlorinated Rubber A/F

Recommended for ships trading in global service. For extended docking intervals (12-15 months) apply two coats.

Sargasso C. R./Sargasso C. R. Japan

Long-life antifouling from keel to deep load line for fast or very large vessels in global service and for docking intervals of up to 18 months. The Japan quality has been specially developed to meet the Japanese poison regulations.

Seven seas

Extra long-life antifouling, to be applied between keel to deep load line, for fast or very large vessels in global service. Docking intervals from 20-24 months are possible with this quality.

These comprise a new class of antifouling whereby the bottom can be kept smooth and free from fouling for 2 1/2-5 years without the necessity of dry-docking the ship.



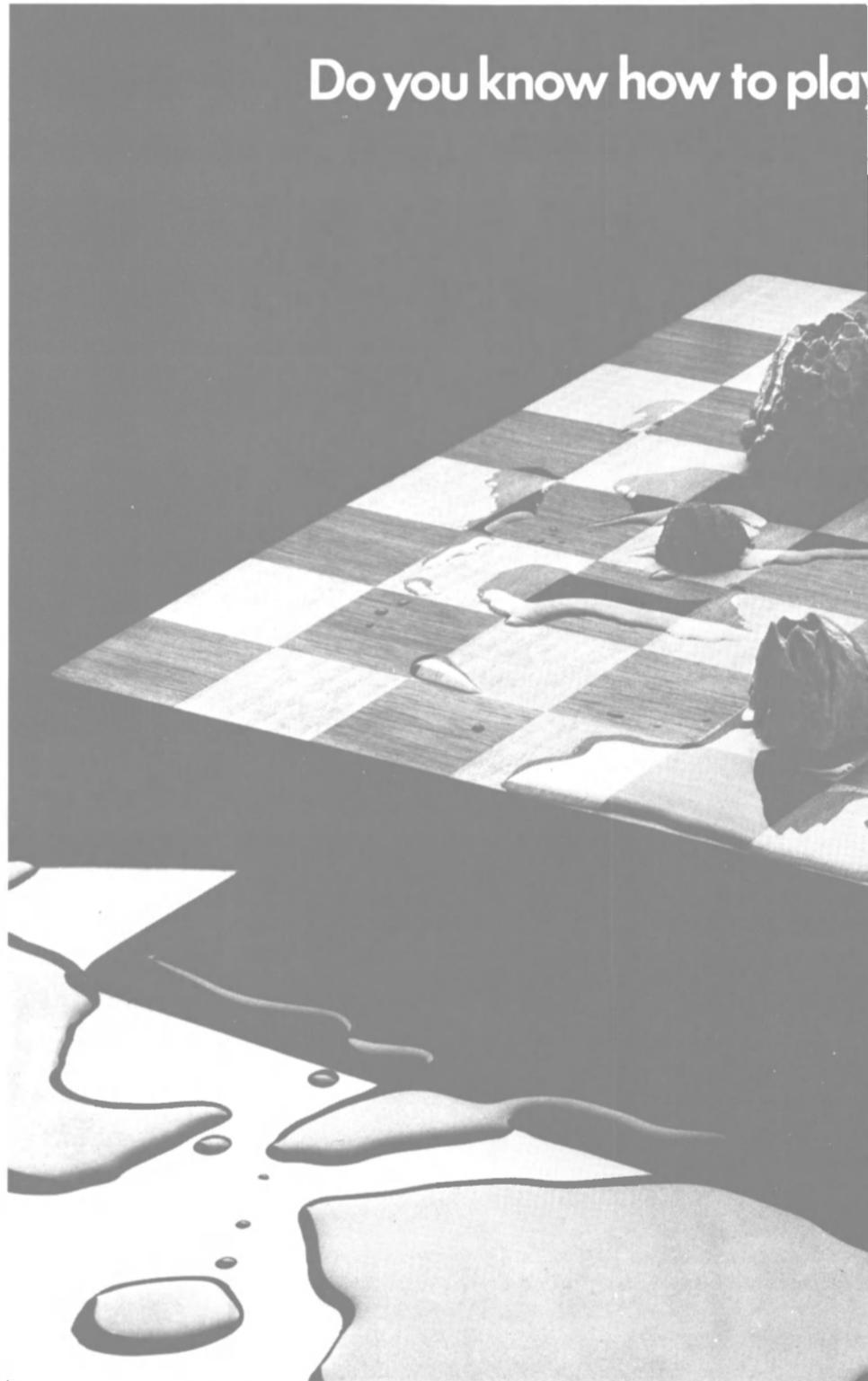
The Seamaster System

Seamaster

SEAMASTER is not only an antifouling but a system consisting of firstclass underwater primer (VINYGUARD) and an antifouling with three special properties.

1. Long-life antifouling properties in the range of Sargasso.
2. It can be kept active by periodic reactivation using special brushes.

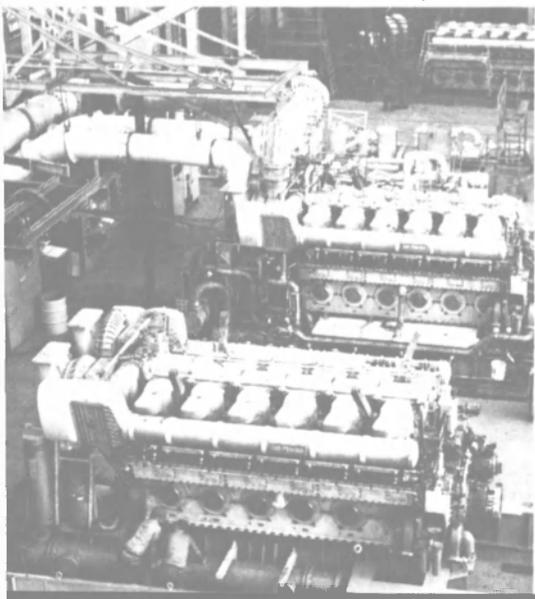
Do you know how to play



The Fouling Game is a game of big profit and heavy losses. Play it by the rules and you can take it home safely, make an erroneous move and it turns into a gamble beyond control.

Your opponent is a coldblooded creature with uncountable resources on hand. You can't beat him unless you're familiar with his strengths and weaknesses. But with the right strategy, the right tactic and an experienced partner by your side, the game is bound to be yours.

The partner is us. Jotun Marine Coatings. We know this game to the bottom. We have the systems, we have the experience, and we're known to keep cool when things start getting hot. We play it safe and we never bluff. And that may be the



have an overall length of 677 feet 10 inches, with a 36-foot draft and deadweight of 41,500 tons. The engines will burn heavy fuels, providing a high degree of economy of operation. All engine components are of U.S. manufacture to comply with Maritime Administration requirements for U.S.-flag vessels under subsidy programs. Also, the engines will be built and equipped to meet the

requirements of American Bureau of Shipping 1978 rules for one-man engine room operation (ACC).

Colt/Pielstick marine diesel engines have been selected by the U.S. Navy for the new amphibious LSD-41 class dock landing ship program planned by the Naval Sea Systems Command. Engines for the first shipset have been ordered, as well as an additional two engines for installation

in a training and testing facility at the Philadelphia Naval Shipyard.

The shipset consists of four 16-cylinder, 8,500-bhp engines with auxiliary equipment. When funded, the LSD-41 program will involve a number of ships, each powered by four Colt/Pielstick diesel engines.

The use of diesel propulsion in these ships offers distinct savings

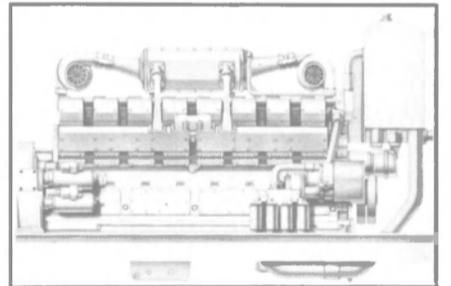
in fuel use. The Navy estimates that eight of the new ships, in replacing eight of an older class, will save more than 20 million gallons of fuel per year. As the diesel engines provide improved fuel consumption, the LSD-41 ships will carry less fuel and still meet necessary cruising range requirements.

According to Mr. Hailey, the Colt/Pielstick design has been exceptionally well received by the American maritime industry. To date, a total of 56 Colt/Pielstick diesels have been built or are on order for marine applications.

Mr. Hailey also stated: "We are very enthusiastic about the marine diesel markets for the salt-water fleet. The demand for large diesels is increasing, and we anticipate this growth to continue over at least the next 10 years. U.S. shipowners are showing more interest in diesel propulsion systems than I have seen in my 30 years in the marine engine business. At present, we are conducting an extensive market study to determine the need for expanded facilities as well as a broader product line with a higher horsepower range of engines. If the need is there, we will meet the requirements of the shipowners."

Cummins Engine Company

Three new engines from Cummins have increased the presence of this manufacturer in the marine workboat and pleasure craft markets. All three respond to users' demands for increased horsepower, better fuel consumption characteristics, and easy maintenance, the Columbus, Ind., company reports.

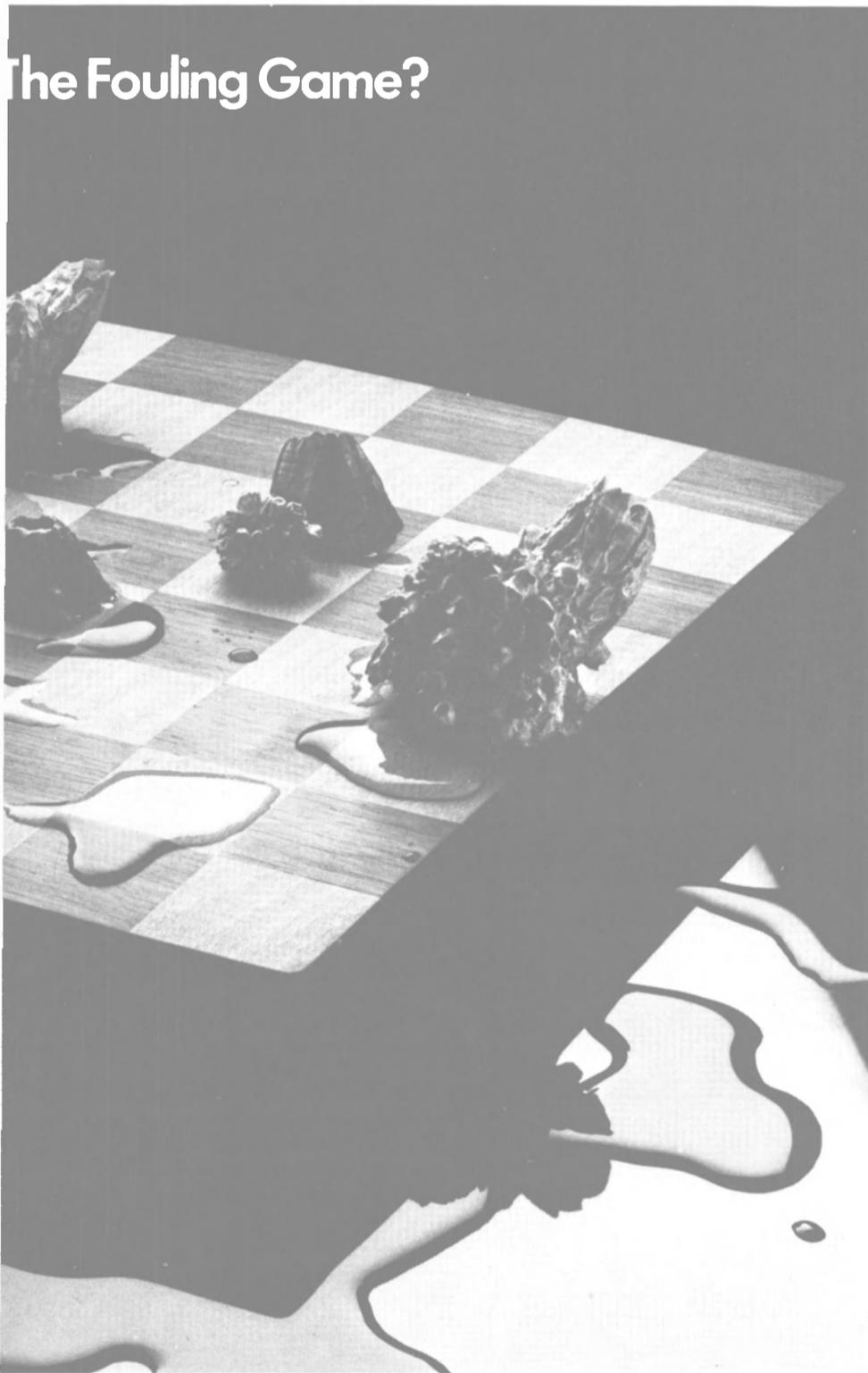


Cummins Engine Company's Model KTA-3067-M16 develops 1,250 bhp at 1,800 rpm.

Cummins' newest "K" engine is the heavy-duty KTA-3067, a 16-cylinder diesel that produces 1,250 bhp at 1,800 rpm during continuous-duty operation. This new engine rounds out the top of the Cummins K product line first introduced in 1975 with the 6-cylinder KT-1150-M. In the past five years hundreds of K-6s have gone into service worldwide, and have become very popular in the industry due to their fuel efficiency and easy maintenance. Key features of the 3,067-cubic-inch engine are its light weight, fuel efficiency, and its serviceability. The V-configuration engine is 120 inches long, 53 inches wide, and 76 inches high. Despite the high horsepower rating, the engine weighs only

(continued on page 22)

The Fouling Game?



reason why our antifoulings succeed in keeping the growth down and pay off in each and every round.

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In this system VINYGUARD takes care of the protection against corrosion while SEAMASTER keeps the underwater hull free from fouling.

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Floatmaster

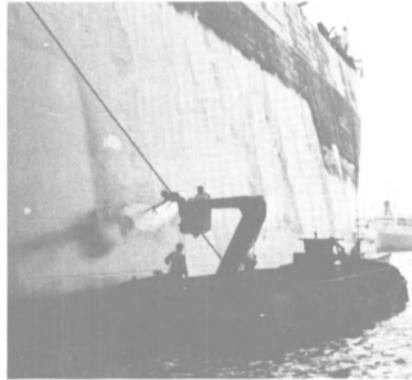
More and more vessels are docking afloat, so called "wet-dockings". Also there is a great interest in reducing the time needed for a dry-docking. There has also been a constant call for an antifouling which dries rapidly, does not need "ideal" weather conditions for application, and dries below the waterline yet still retains the lasting properties of a good long-life antifouling.

Antifouling FLOATMASTER fulfils these demands completely. After 20 minutes air-drying, FLOATMASTER can be exposed to seawater.

Due to a perfectly balanced binder/solvent combination FLOATMASTER is able to dry under water as fast as in air. The resulting film has the same high antifouling standard as SARGASSO C. R. with an expected lifetime of 18 to 20 months.

In combination with Silverseal as a primer, it is possible in favourable conditions to dry-dock a vessel with a full paint system within 16-20 hours.

In lower temperatures the application and drying time can increase by some 50 per cent.



Takata LLL

Antifouling Takata LLL is an antifouling developed by the Jotun Marine Coatings' partner in Japan, Nippon Oil & Fats Co., Ltd. (N.O.F.). It is based on an organo metallic-acrylic co-polymer which is slowly hydrolyzed in seawater, releasing the active antifouling. Contrary to other antifouling, the active ingredient is intimately bound in the vehicle, and thus the release of the toxicant will result in an even breakdown of the coating, leaving a completely smooth and non-porous surface.

The antifouling properties of the special toxic agent/vehicle co-polymer used is comparable to that of any longlife antifouling on the market.

Antifouling Takata LLL is therefore combining the properties of a first rate long-life antifouling with an extremely smooth, low friction surface.

Antifouling Takata LLL was first marketed in 1972, and until now, some fifty tankers (mainly VLCCs) have been treated with this product.

Diesel Power Review

(continued from page 21)

10,700 pounds with standard accessories, but without gear. Fuel consumption is rated at 63 gallons per hour. Service is made easy by individual cylinder heads and replaceable wet-type liners.

These features convinced **John Wronoski** of New London, Conn., to become the first owner to specify the KTA-3076. It will be used

in an ocean tug now being built—the latest of many **Wronoski** boats that have used Cummins power since 1952.

Crabbers, seiners, and trawlers have found the KT-2300-M to be the answer to their power needs since it was introduced in 1979, Cummins reports, but 1980 marks the first use of this model diesel on the inland waterways. In July this year the *Jeanne Marie*, a switchboat plying the St. Louis area for Archway Fleeting and

Towing Services, became the first new inland boat powered by the 11,700-pound engine.

The KT-2300-M is rated 700 bhp at 1,800 rpm, while the after-cooled model produces 940 bhp at 1,800 rpm during continuous duty. Both engines feature the same easy maintenance characteristics as the KTA-3067.

Archway's manager of operations **David Houlihan** thinks the KT-2300-M can respond to the challenge of quick pivots and

swift floodstage currents better than smaller engines that are commonly used in switching operations. He also was impressed by the fuel consumption advantages the KT-2300 had over competing engines. "We project an annual fuel savings of \$80,000 using the Cummins engine," he said in comparing the KT-2300 with its nearest competitor.

The VT-555-M is a new engine designed for twin-screw applications in pleasure and sport fishing craft. It features the highest horsepower to weight ratio of any engine in its class, according to Cummins. The turbocharged, 555-cubic-inch V-8 engine is rated 320 bhp at 3,000 rpm, an 18-percent improvement over the 270-bhp VT-555-M offered by Cummins.

A larger camshaft and higher capacity heat exchanger system are responsible for the horsepower improvement and for a five percent improvement in fuel economy over the previous model, the company said.

Detroit Diesel Allison

This division of General Motors Corporation, located in Detroit, has been providing reliable and durable diesel power to the marine industry for more than four decades. DDA offers more than 53 marine diesel engine models covering a power range from 100 to over 1,100 continuous shaft horsepower (net power available at the marine gear output shaft). All Detroit diesels provide excellent horsepower-to-weight ratios.

Detroit diesels are available in in-line or V-type configurations to fit almost any hull plan. A total of six low-profile configurations are offered to accommodate engine compartments with limited overhead clearances.

DDA's ability to provide right- and left-hand engine rotation permits port and starboard rotations with all marine gear designs. These "mirror image" matched in-line engine pairs are the ideal power for twin-screw installations.

Marine engine models are offered in four engine series—the 53, 71, 92, and 149 Series—each named for the cubic-inch displacement per cylinder. The Series 53 marine line consists of 4-cylinder in-line and 6-cylinder V-type models.

Naturally aspirated and turbocharged versions of Series 71 Detroit Diesel engines have long been the standard marine engines around the world, beginning with the 71s that powered Allied Navy landing craft during World War II. The Series 71 marine line is offered in 4- and 6-cylinder in-line models; 6-V, 8-V, 12-V, and 16-V models also are available. Most are available in naturally aspirated and turbocharged/intercooled configurations.

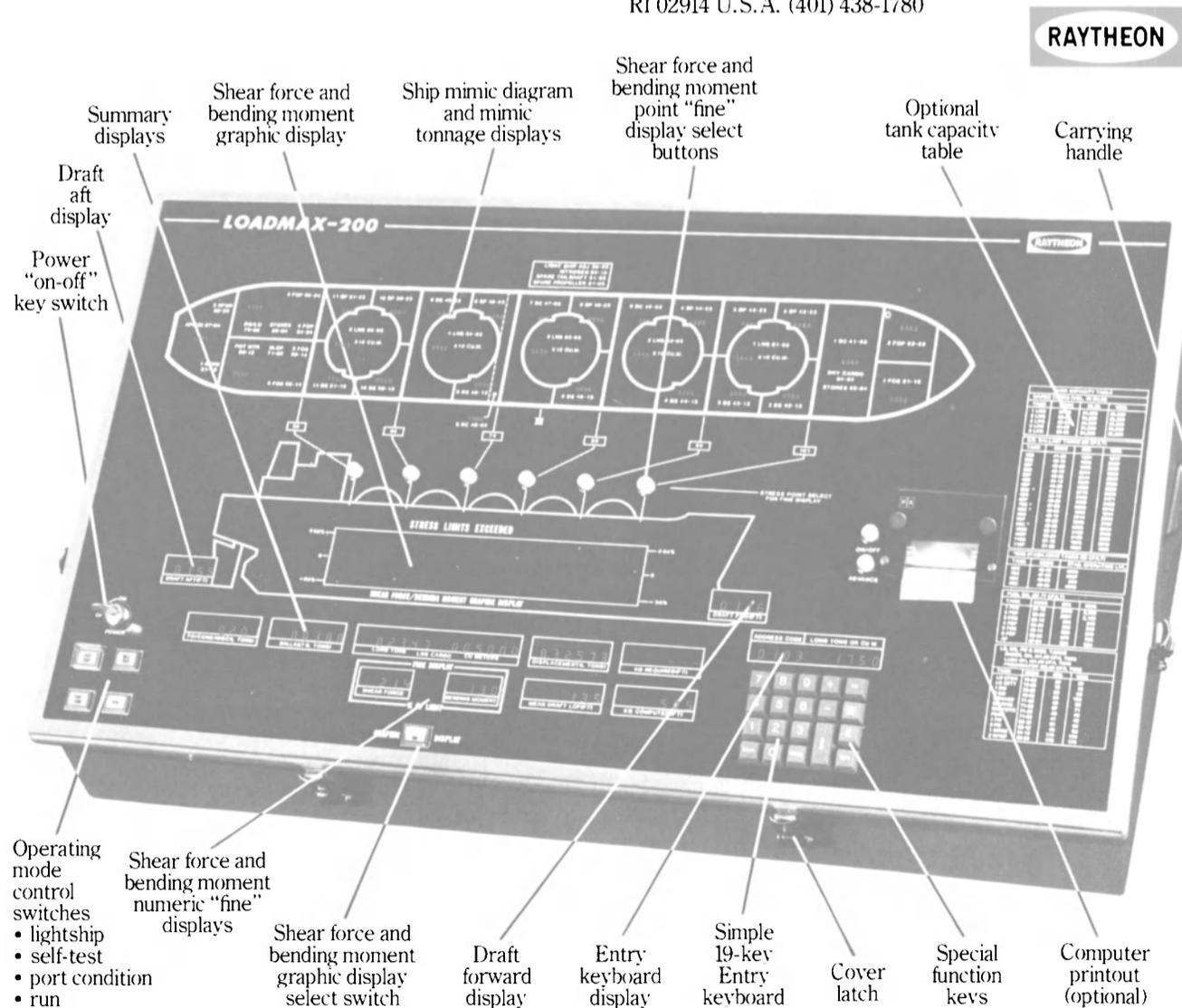
The DDA 12V-71 marine engine has proven to be extremely (continued on page 24)

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Diesel Power Review

(continued from page 22)

popular in commercial workboat applications. This model has achieved a reputation for high performance and dependability in crewboats, riverboats, towboats and tugs, and many commercial fishing vessels, worldwide.

For crewboat and some special fishing boat applications in which

extra power is required on an intermittent basis, the turbocharged/intercooled 12V-71TI has been the choice of many operators. This model provides up to 25 percent greater horsepower at the shaft, with no significant increase in size or weight over the naturally aspirated engine.

This engine is also available in a low-profile configuration. Designed for high-speed, high-out-

put propulsion, the 12V-71TI Low Profile marine engine is ideally suited for vessels requiring a compact, high-performance diesel in limited engine compartment space.

The Series 92 engines come in naturally aspirated and turbocharged versions of 6-, 8-, and 16-cylinder V-type models. The Series 149 marine engines are available in 12- and 16-cylinder V-type models, and also are manufactured in

naturally aspirated and turbocharged versions.

Detroit Diesel marine engines are equipped with marine gears, and heat-exchanger cooling is standard on most models. A wide selection of electrical systems is available to meet various installation requirements.

Electro-Motive Division, GM

General Motors Model 645E marine diesel engines, which are manufactured by the Electro-Motive Division in La Grange, Ill., now provide more than 4.8 million brake horsepower for 2,000 marine applications worldwide. The full line of 645E diesels, in seven engine sizes, covers all marine power needs from 975 to 3,600 bhp. Multiple engine drives up to 14,000 bhp also are available.

Features of the 645E include: engine, reverse/reduction gear, and controls as a complete package; ratios in close steps, matching propeller speeds; propeller speeds from 133 to 360 rpm, basic standard sizes; all gears furnished either horizontal or vertical offset; built-in propeller thrust bearing; inspected and certified by American Bureau of Shipping or other inspection agencies; remote controls included; available with engine and gear on common base.

With EMD's engineering research concentrated on the turbocharged model, an improved 645E7B has been developed. This new model provides an approximate two percent improvement in fuel economy by improved combustion and thermal efficiency. Major factors contributing to increased fuel economy are improved turbocharger and injector designs.

Other design changes include piston pin and carrier, piston pin insert bearing, camshaft, and rocker arm followers. Additional 645E7B engine design improvements such as laser-hardened cylinder liner bore and pre-stressed top piston ring increase the already high reliability and maintainability of EMD engines. These new design components can be retrofitted into EMD 645E engines presently in service.

EMD also supplies the highly dependable 645E non-turbocharged engine, with its continuing reputation for durability. The non-turbocharged engine, scavenged by Roots type blowers, is offered in 8-, 12-, and 16-cylinder sizes. The turbocharged engine is available in 8-, 12-, 16-, and 20-cylinder sizes.

The turbocharger of the improved E7B engine has the following design changes: new turbine blade airfoil shape to improve turbine efficiency along with modified turbine blade serration for reduced operating stresses and improved reliability; new, high-efficiency compressor diffuser to improve compressor ef-

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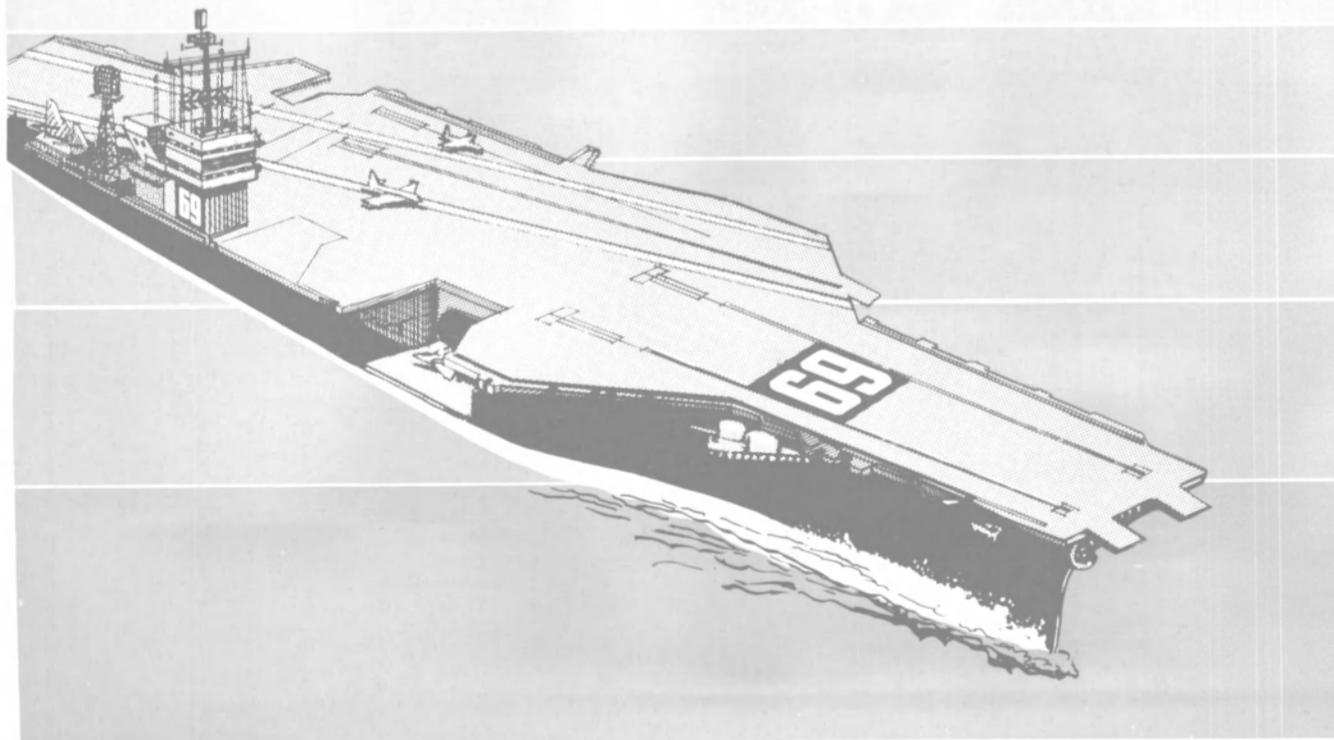
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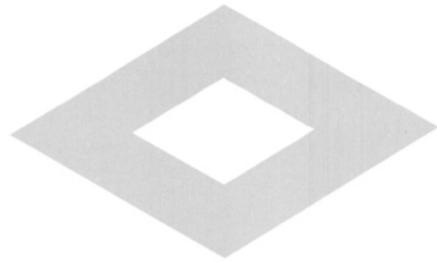
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The 265,000 dwt VLCC NEW YORK, built at Bethlehem Steel Corporation's Sparrows Point Shipyard, leaving for sea trials.

Diesel Power Review

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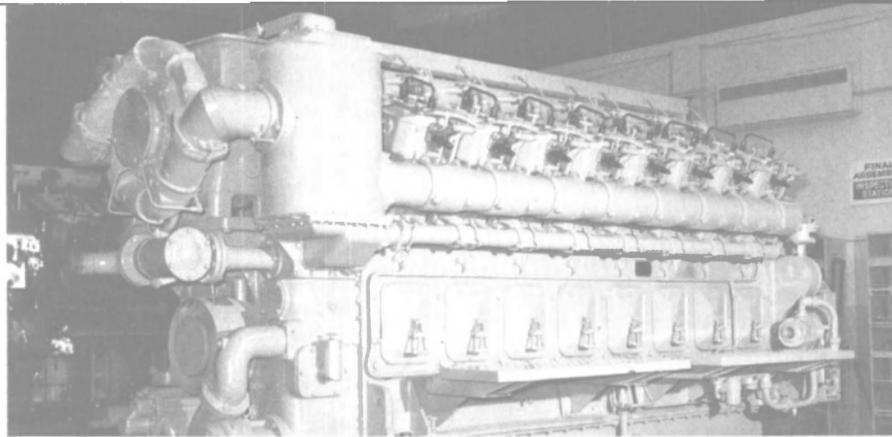
efficiency and increase air flow; and revised turbine nozzle.

The new injector design features a 0.500-inch-diameter plunger that provides an increased injection rate for improved combustion and thermal efficiency. The new injector also includes the

"low sac" spray tip that reduces smoke and undesirable emissions.

General Electric Company, Diesel Power Products

General Electric Company's Diesel Power Products (Erie, Pa.) offers an advanced four-cycle engine, available in 8-, 12-, or 16-cylinder sizes with power ratings from 1,500-3,500 hp. The manufacturer reports the engine's high capacity turbocharger and effi-



General Electric's turbocharged V-16 has rating of 3,500 bhp.

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Our work—voyage repairs, major conversions, and scheduled drydocking—is done by skilled people like Arthur. Competent, hard-working, gung-ho men and women. Many of whom have been here their whole working lives.

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New York, N.Y. 10006
Tel. (212) 432-0350

We just shortened name to Savannah Yard Co.

cient combustion system offer a low fuel rate. Additional features, such as easy accessibility to components and maximum standardization of parts, offers marine users low maintenance and a minimum spare parts inventory.

General Electric states their engine's modern design concept offers significant advantages, including: A reliable constant pressure stainless-steel exhaust manifold located in the "V" of the engine block for easy accessibility; Effective operation with a wide variety of lube oils; All oil passages to the bearing positions accessible through plugs at the top of the gallery. Engine protection includes automatic shutdown upon detection of low water pressure, low lube oil pressure, engine overspeed, or excessive crankcase pressure.

GE's exhaust-driven turbocharger contributes significantly to the engine's low fuel rate.

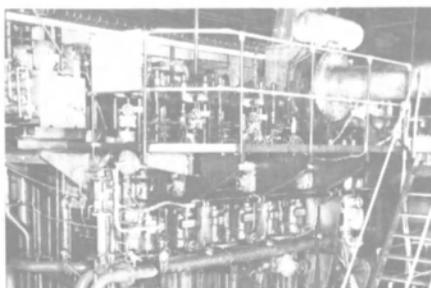
Unitized cylinders are a unique feature of the General Electric diesel engine. Each is mounted on top of the main frame with four bolts and has individual water and air passages, completely isolated from the main frame. Three major elements—the liner, steel head insert, and external jacket—make up the unitized cylinder. The cylinder can be removed for inspection, maintenance, and repair. Inspection, maintenance, and replacement of pistons is also simplified. With the cylinder removed, the piston is completely exposed. All unitized cylinders on GE diesel engines are interchangeable.

Grandi Motori Trieste

Latest addition to the GMT production range—the CC 600 engine—is a completely new design concept in marketing philosophy and production whose keynote is versatility. It is intended for the widest possible range of ship propulsion duties—direct coupled in vessels where higher propeller speeds are used, or geared to give

Diesel Power Review

(continued from page 27)



aboard ships; for stationary power-generating plants; and for plants combining power generation with waste heat recovery.

The 20/27 engine is offered in diesel, spark-ignited gas, and dual-fuel versions. The cylinder rating of the diesel engine is 100 kW (134 bhp) at 1,000 rpm according to the ISO definition. Its mean effective pressure and mean piston speed are 14.15 bar and 9 meters per second, respectively.

Since the 20/27 engine was put on the market in September 1979, M.A.N. and its licensees have re-

America also offers a variety of diesel-generator sets, incorporating SA or SN engines.

Mitsui Engineering

Mitsui Engineering & Shipbuilding Company, Ltd., a Burmeister & Wain licensee, has achieved world records in diesel engine building four times in less than a decade. Its first, for aggregated bhp for a single type marine diesel was established in 1968 when a total production of four million bhp was reached. Re-

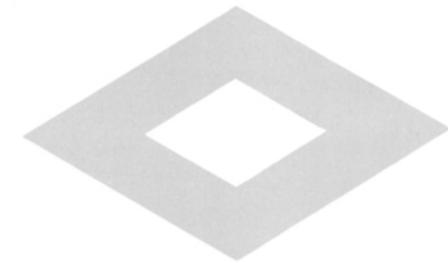
novating its own record by beating

per peller revolutions, or generator sets of 50 or 60 Hz.

Against this background MTU unveiled, at the recent Ship, Machinery, Marine Technology International Exhibition and Congress in Hamburg, a new 16-cylinder engine, the 396-03 series, with the same hardware commonality as in the existing 6-, 8-, and 12-cylinder models. The 03 series enables the same design principle to be retained up to a maximum output level of 1,760 kw (2,400 bhp). The 16V 396 TC engine has a per cylinder output of 111 hp at

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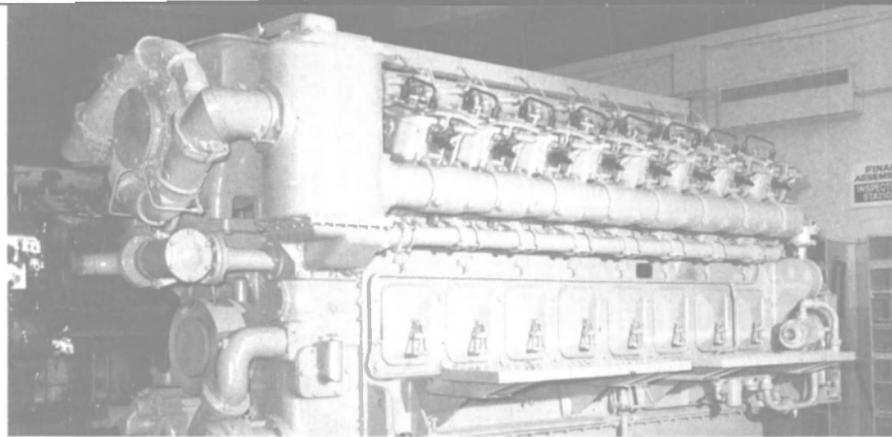
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The CC 600, being a 2-stroke, crosshead type engine, will run on the cheapest low-grade fuel oil; the design throughout has taken into account the fact that the quality of such fuel will continue to deteriorate.

Despite the presence of a crosshead, separated crankcase, and the working spaces typical of a more traditional low-speed 2-

stroke engine, the low stroke/bore ratio adopted in the CC 600 leads to an extremely compact design. Producing 1,650 hp per cylinder at 250 rpm in versions from 4 to 10 cylinders, this engine can be fitted into almost any machinery space, however restricted, as its compactness is complemented by a unique facility to withdraw the piston without its rod in a much reduced overhauling height.

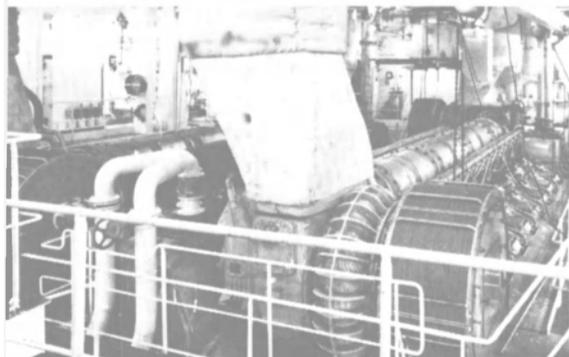
The CC 600 engine retains all the characteristic design features of the previous GMT low-speed, 2-stroke engine range — the B 1060, C 900, C 780, and C 600 types — and its construction details are solidly based on the wealth of experience built up over the many years during which the validity of the design principles has been proved in the previous low-speed engine types. It differs from the other engines in that it has a low bore/stroke ratio of 1.33:1 as opposed to the normal ratio of about 2:1.

Much interest in the CC 600 is already being shown by clients in both the marine and industrial sectors, and many promising projects are being studied. The first order for a CC 600 engine has been received, this for a 5-cylinder unit of 8,250 bhp for a 15-knot gas chemical carrier of 12,000 dwt to be built by the Benetti yard for Carbocoke of Genoa.

A market of particular interest could well develop for the CC 600 design from the increasing number of cases where conversion from existing steam plants is being considered. With a pre-established propeller speed and engine room configuration, these installations usually demand a geared plant. Their large (albeit diminished) power requirements and high utilization factor underline the importance of burning the most economical fuel available to achieve the objective of the conversion. The CC 600 fits these requirements admirably.

GMT's B 600 engine is a slow-speed 2-stroke of 1,500 bhp per cylinder at 160 rpm, and was designed essentially as a compact, simple, and reliable engine that can be built at a competitive cost and is particularly easy and economic to maintain. This engine is planned to meet the needs of the substantial and growing market for smaller ships of all kinds where direct-drive, low-speed engines can be accommodated. It is adaptable to give optimum efficiency over a range of maximum

Two GMT B550 22,400-bhp engines power container ship Ercole Lauro.



service speeds from 145 to 160 rpm.

The B 600 retains the basic GMT traditional 2-stroke characteristics of its existing range of 2-stroke engines with cylinder bores of 1,060 mm, 900 mm, and 780 mm, but also has many new features and refinements. It is designed to operate reliably on the worst grades of heavy oil being predicted, and will be built with

from 4 to 10 cylinders to cover powers from 6,000 to 15,000 bhp.

Two 10-cylinder units of the B 600 engine, each developing 15,000 bhp (mcr) at 160 rpm are on order for Home Lines' 30,000-gt cruise ship under construction at the CNIM Shipyard in France.

M.A.N.

The current engine program of M.A.N. (Maschinenfabrik Augsburg-Nürnberg AG) includes five

four-stroke engines with bores from 200 to 520 mm, and five two-stroke engines with bores from 520 to 900 mm — three of which are long-stroke versions. The four-stroke engines cover an output range from 134 to 1,187 bhp per cylinder, and the two-stroke engines from 1,187 to 3,889 bhp per cylinder. The mean effec-

(continued on page 28)

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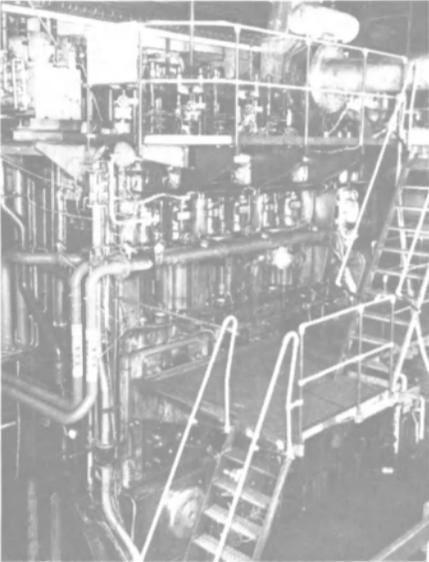
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HARTZELL

Hartzell Propeller Fan Company, Piqua, Ohio 45356

Diesel Power Review

(continued from page 27)



M.A.N.'s K3EZ 52/105 C/CL test engine shown on the test bed.

tive pressure of the four-stroke engines is 20 bar (25 bar with two-stage supercharging), and that of the two-stroke engines is 13 bar and 14.5 bar for the low-speed types and approximately 15 bar with the two-stage H engines. The maximum cylinder pressure of the medium-speed engines is up to 145 bar, and that of the two-stroke engines is 115 bar.

Today's engine production program at M.A.N. thus combines, on a high-power level, proven principles with present and future demands. The most important development targets for the updated program were:

Ability to burn heavy fuel oils up to 3,500 seconds Redwood 1 in the case of four-stroke engines, and up to 6,000 sR1 in the case of two-stroke engines; adherence to proven design concepts wherever expedient; variation in turbocharger arrangement and selection of optimum speed; type of construction fully developed in terms of production, engineering, and maintenance; and high quality standard.

By proven design principles M.A.N. understands that for as many components of different engine types as possible, the same design solutions are used, permitting the transfer of computed and measured results from trial data and practical experience.

The constant demand from the shipowners and shipyards for a smaller engine developing below 1,000 kW (1,341 bhp) and the rising interest in smaller stationary units for combined power/heat generation prompted M.A.N. to develop the 20/27 engine. This engine is available as an in-line unit with four to nine cylinders, and as a V engine with 12 to 18 cylinders.

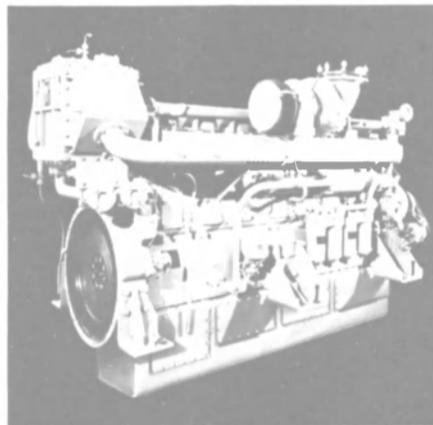
The 20/27 engine is intended mainly for the following applications: as a propulsion engine for smaller vessels; as an auxiliary engine for power generation

aboard ships; for stationary power-generating plants; and for plants combining power generation with waste heat recovery.

The 20/27 engine is offered in diesel, spark-ignited gas, and dual-fuel versions. The cylinder rating of the diesel engine is 100 kW (134 bhp) at 1,000 rpm according to the ISO definition. Its mean effective pressure and mean piston speed are 14.15 bar and 9 meters per second, respectively.

Since the 20/27 engine was put on the market in September 1979, M.A.N. and its licensees have received orders for a total of 54 units with 383 cylinders. A 5L20/27 heavy fuel oil engine has meanwhile successfully completed type test in Augsburg in the presence of representatives of the classification societies.

Mitsubishi Heavy Industries



Mitsubishi diesels are sold in U.S. Gulf area by Oosterhuis Industries.

Mitsubishi marine diesel engines are available in the U.S. from Mitsubishi Heavy Industries of America, Chicago, and in the Gulf Coast area through Oosterhuis Industries, Inc. in New Orleans.

The Mitsubishi marine engines marketed in the United States are the Daiya series, a medium-speed, 4-stroke diesel built as a 4- and 6-cylinder in-line and offered as a complete unit with Mitsubishi reverse/reduction gear.

The Daiya diesels are heavy-duty engines that turn at about 900 rpm and are specifically designed for marine applications and for burning economically priced, lower quality fuel oils. They develop from 400 to 1,100 bhp (298-820 kw) and have been gaining rapid acceptance in the U.S.

Other Mitsubishi engines available are the SA and SN series, high-speed, 4-stroke diesels of sturdy design that, during the past decade, have gained wide acceptance in Europe. The SA engines are available in 6-cylinder in-line and 12-cylinder V type versions, developing from 185 bhp at 1,200 rpm to 800 bhp at 1,800 rpm (138-596 kw). The SN series are available in 6- and 8-cylinder in-line, and 12- and 16-cylinder V type in a horsepower range from 275 bhp at 1,200 rpm to 1,800 bhp at 1,800 rpm (205-1,342 kw).

Mitsubishi Heavy Industries of

America also offers a variety of diesel-generator sets, incorporating SA or SN engines.

Mitsui Engineering

Mitsui Engineering & Shipbuilding Company, Ltd., a Burmeister & Wain licensee, has achieved world records in diesel engine building four times in less than a decade. Its first, for aggregated bhp for a single type marine diesel was established in 1968 when a total production of four million bhp was reached. Renewing its own record by boosting the aggregated bhp to five million in 1970 and seven million in 1973, it surpassed a milestone 10 million bhp mark in October 1976.

Mitsui's history of diesel engine production goes back to 1926, when it entered into the technical licensing agreement with B&W. In 1961 it completed the first main engine built in Japan with a remote control system from the bridge. In 1970 the company completed a 38,000-bhp engine, followed by one of 40,900 bhp the next year, both having the largest output in the world at that time. Further, to meet the demand for more efficient and economical engines, it developed a long-stroke engine in 1976 that has since become very popular among its users.

Following the development in 1973 of its V60M 4-stroke, medium-speed geared diesel engine incorporating an automated maintenance and inspection system, in 1976 Mitsui developed the L/V42M series to meet the need for a wider output range.

Motoren- und Turbinen-Union

The 396 Series engine family of MTU, Friedrichshafen, West Germany, has found wide acceptance in the international marketplace. Up to mid-1980, approximately 1,600 engines of this series have been put into service—some 25 percent of them installed aboard ships as main propulsion or for ship's services.

The long-stroke (185 mm) 396 engine features application engineering advantages in overall systems requiring engine revolutions from 1,200 to 1,800 rpm, such as workboat propulsion with low pro-

peller revolutions, or generator sets of 50 or 60 Hz.

Against this background MTU unveiled, at the recent Ship, Machinery, Marine Technology International Exhibition and Congress in Hamburg, a new 16-cylinder engine, the 396-03 series, with the same hardware commonality as in the existing 6-, 8-, and 12-cylinder models. The 03 series enables the same design principle to be retained up to a maximum output level of 1,760 kw (2,400 bhp). The 16V 396 TC engine has a per cylinder output of 111 hp at 1,650 rpm for commercial vessels, 143 hp at 1,900 rpm for fast vessels, and 150 hp at 2,100 rpm for high-performance craft. The 396-03 engines will be delivered starting in the spring of 1981.

Major technical modifications that produced the increased performance were a reduction of the compression ratio to retain the ignition pressures customary for the 02 series in spite of the better performance, and introduction of a composite piston together with better-matched turbocharger and injection systems.

The intensive turbocharger research in particular enabled such a rise in output without increasing consumption. An additional, particularly important point is the introduction of cylinder cutout.

S.E.M.T. Pielstick

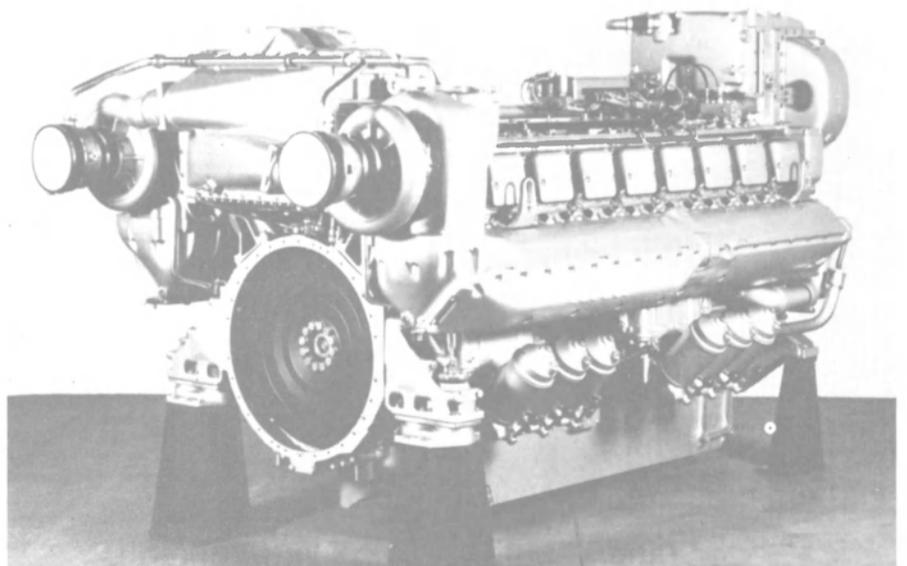
Alsthom-Atlantique Departement Moteurs S.E.M.T. Pielstick of Saint-Denis, France, with 25 diesel manufacturers in 18 countries building its engines under license or sublicense, dominates the medium-speed diesel field. The S.E.M.T. line also includes high-speed engines. In 1979, Pielstick medium- and high-speed engines for marine applications accounted for 41.6 percent of the market worldwide.

As of June this year, 2,203 Pielstick medium-speed diesels of the PC type had been delivered for marine applications, aggregating 27,451 cylinders and 15,117,294 bhp. At the same time, 959 high-speed marine engines type PA were in service—a total of 11,408 cylinders and 1,647,987 bhp.

The latest development in the S.E.M.T. PC2 range of engines is

(continued on page 30)

New MTU 16-V diesel increases power range of 396 series to 2,400 bhp.



Keep the boat working

The MV Dennis Hendrix does — at nearly 98% utilization of her engines at an estimated 80% load factor. Almost 17,000 hours, on MVI Caprinus® R Oil.

With only 1400 hours on her three 16-645-E5 EMD engines, the Dennis Hendrix was switched over to Shell's MVI Caprinus* R Oil. That was in the Summer of 1977. When launched, on July 16, 1977, the boat started working the Lower Mississippi pushing tows of up to 40 barges of 1500 tons each. On August 19, 1979, she was finally ready for her first scheduled overhaul. Total engine hours averaged 17,885. Individual engine hours were; port — 18,124, center — 17,421 and starboard — 18,110. Total *elapsed* time from the date of launch; 18,312 hours. And work on the Lower Mississippi usually means long runs with few interruptions. It was estimated that the load factor was averaging about 80% during these hours. In over two years, the engines averaged only 2.3% downtime.

The Dennis Hendrix was the first American Commercial Barge Line vessel to use Caprinus R. So, when the overhaul was scheduled, Shell went along to see the results. As is usual with Caprinus R oil, the engines were very clean, with relatively low deposit levels. Wear was low for the time and type of service. Used oil analysis showed that the premium MVI Caprinus R Oil had equilibrated at a TBN-E of 3.0, which means corrosion protection was adequate even though the engines were operated in 'no drain' service. Carbon deposits were as expected with an MVI oil, soft and flaky.

All three engines appeared about equal in appearance, and the port engine was selected for

detailed inspection. Top rings all rated 2A, #2 rings rated 2 and 2A and #3 compression rings all rated 1. These values are well within the normal range for engines at overhaul. Liner wear was normal for the hours. All three engines had done their job well. The oil had done its job well. MVI Caprinus R oil had helped the Dennis Hendrix stay on the job with minimum downtime and maximum reliability.

MVI oils have been proven in almost half a century of operation in medium-speed diesels. Shell's MVI Caprinus R Oil maintains that reputation of MVI oil and uses a modern additive package to meet the latest engine service requirements.

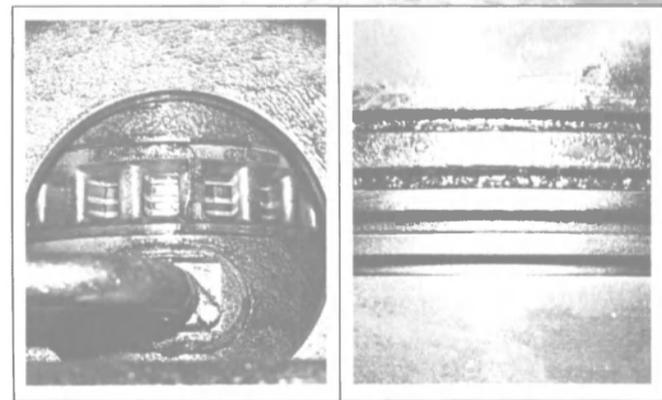
Shell doubling MVI capacity

Since Shell is *doubling* its MVI lube oil capacity, there is no need to switch to HVI oils, as suggested by some MVI-short suppliers. HVI oils form harder, denser carbon deposits that can block port areas and crowd rings in their grooves. With Caprinus R Oil, you can usually operate without changing oil in most engine types with good engine protection. A used oil analysis program can be the means to longer life and excellent engine protection with Caprinus R Oil.

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

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

Come to  Shell for answers



The light carbon deposits in the airbox are typical of a premium MVI oil such as Caprinus R. Soft deposits will clean up rapidly, and even after 17,000 hours, are not blocking air flow.

Pistons had no scuffing or scoring. Ring groove fill and ring wear were normal for the time and type of engine service. Rings were free.

Diesel Power Review

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the PC2-6 with an output of 750 hp per cylinder at 520 rpm, a mean effective pressure of 21.5 kilograms per square centimeter, and a piston speed of 7.97 meters per second. The PC2-6 is offered in two versions — as an in-line with 6, 8, or 9 cylinders, and in

V-form with 12, 14, 16, or 18 cylinders.

Using a multi-pulse converter (MPC) supercharging system, together with a modified combustion chamber and a new injection timing, remarkable results are said to have been achieved with specific fuel consumption (ISO conditions). At maximum continuous rating the fuel rate is 142 grams per hp hour, for continuous serv-

ice operation the rate is 140 grams per hp hour, and at optimized conditions a fuel rate of 137 grams per hp hour was achieved.

The PC2-6, as do all other Pielstick engines of the medium-speed type, runs on the heaviest residual fuels — up to 4,000 seconds Redwood.

Fairbanks Morse Engine Division is the U.S. licensee for S.E.M.T. Pielstick PC engines.

Stork-Werkspoor Diesel

During the past year, Stork-Werkspoor Diesel of Amsterdam has directed its research and development activities towards new engine types, thermodynamic considerations, and use of heavy fuels.

The new 12-cylinder, V-form TM 620 has been tested and measured on all special V-form components. As a consequence, a single medium-speed engine of only 12 cylinders with a rating of 22,000 bhp (16,200 kw) is now available.

Fuel consumption is of great importance today, and at SWD developments are made constantly on many engine details to reach the lowest values possible. Great care is required, however, as various measures in the direction of maximum economy can result simultaneously in an increase in the thermal load, and the load advantages achieved by controlling the thermal load must be retained. Nevertheless, respectable fuel consumption rates have been achieved, especially at somewhat reduced loads. For the TM 620 engine, a fuel rate of 190 grams per kw hour has been attained. Research is continuing in this area.

From the beginning, the TM 410 and TM 620 engines have been developed to run on heavy fuel. As a consequence, only small adaptations are necessary for the fuels of inferior quality that are expected to appear on the market in the near future. These fuels will have a higher content of larger molecules, which can lead to slower burning and increased fouling.

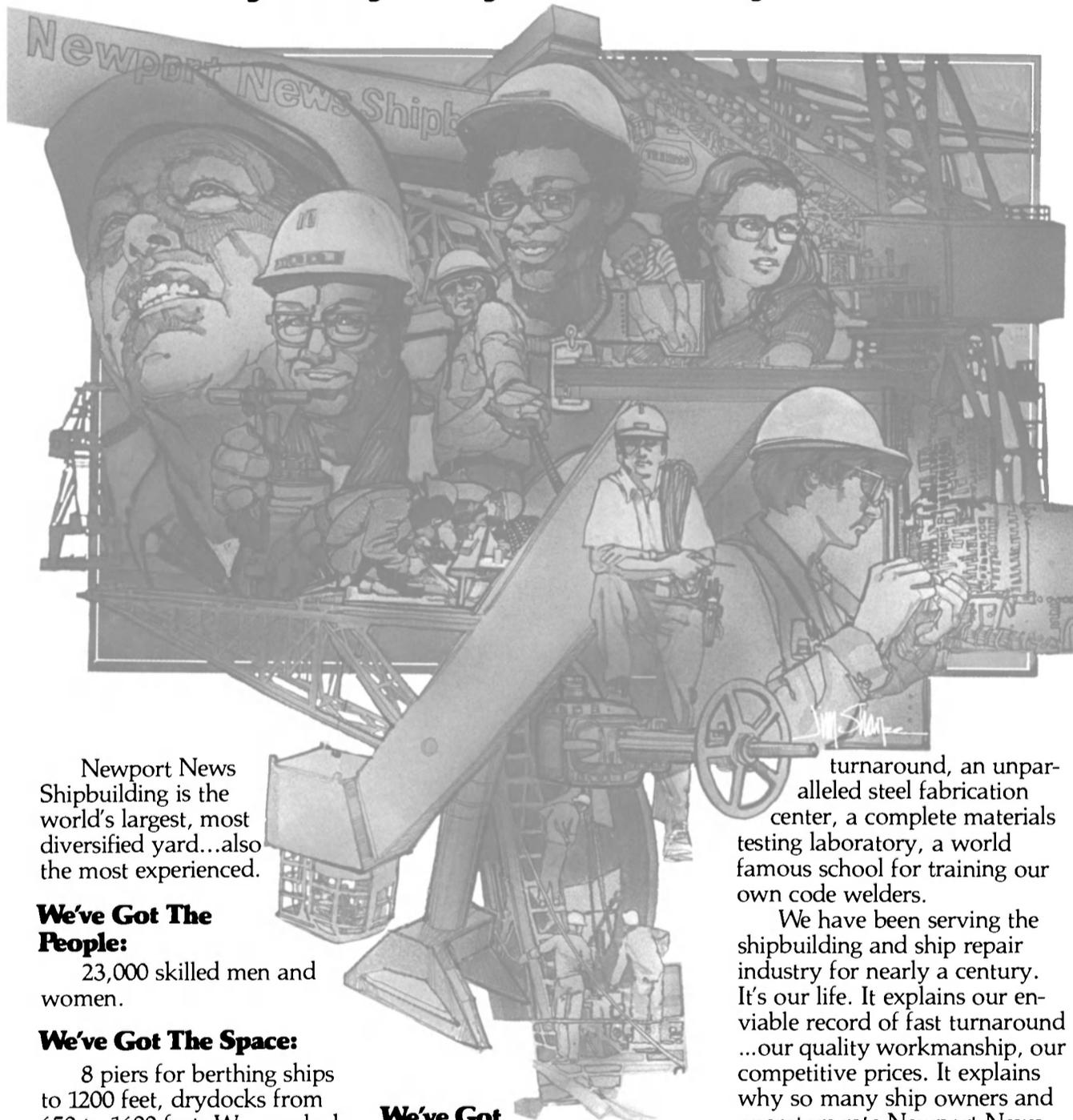
Another risk, however, is caused by mixing problems (compatibility) of oils from different sources, which can seduce oil companies to use light aromatic oils as a remedy. As a result, more and more often fuels with poor ignition properties appear on the market. The latter problem was attacked first by Stork, and has led to the introduction of air-inlet heating at part load in cases where the use of such fuels cannot be avoided.

Subsequently, trials have been run at SWD with a specially formulated "future" fuel. This fuel oil had a Conradson carbon number of about 20, 11 percent asphalt, and a viscosity of approximately 4,800 sec RI at 100 F. The trials took place in a 9-cylinder TM 410 engine, and the objective was to investigate the partial load range in particular, because it was there that the greatest fouling was feared, especially as a result of gas blow-back in the inlet passage.

SWD found the results "astounding." First, the engine started immediately and ran if possible more quietly than usual. Obviously this fuel, as opposed to the

(continued on page 33)

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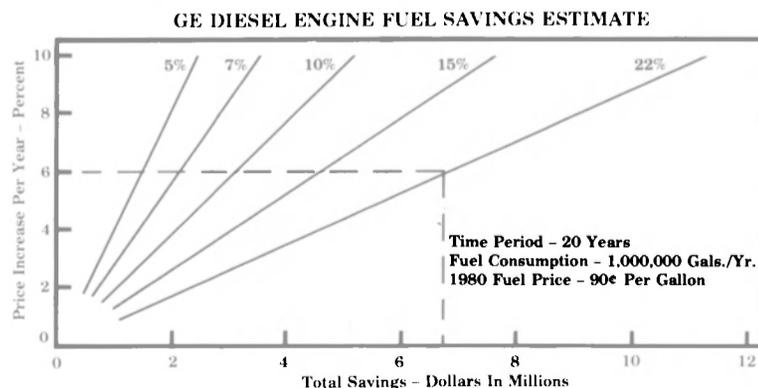
The Senator Eastland is off to a new fuel-efficient start thanks to the GE diesel engine

Congratulations, Brent Towing Company!

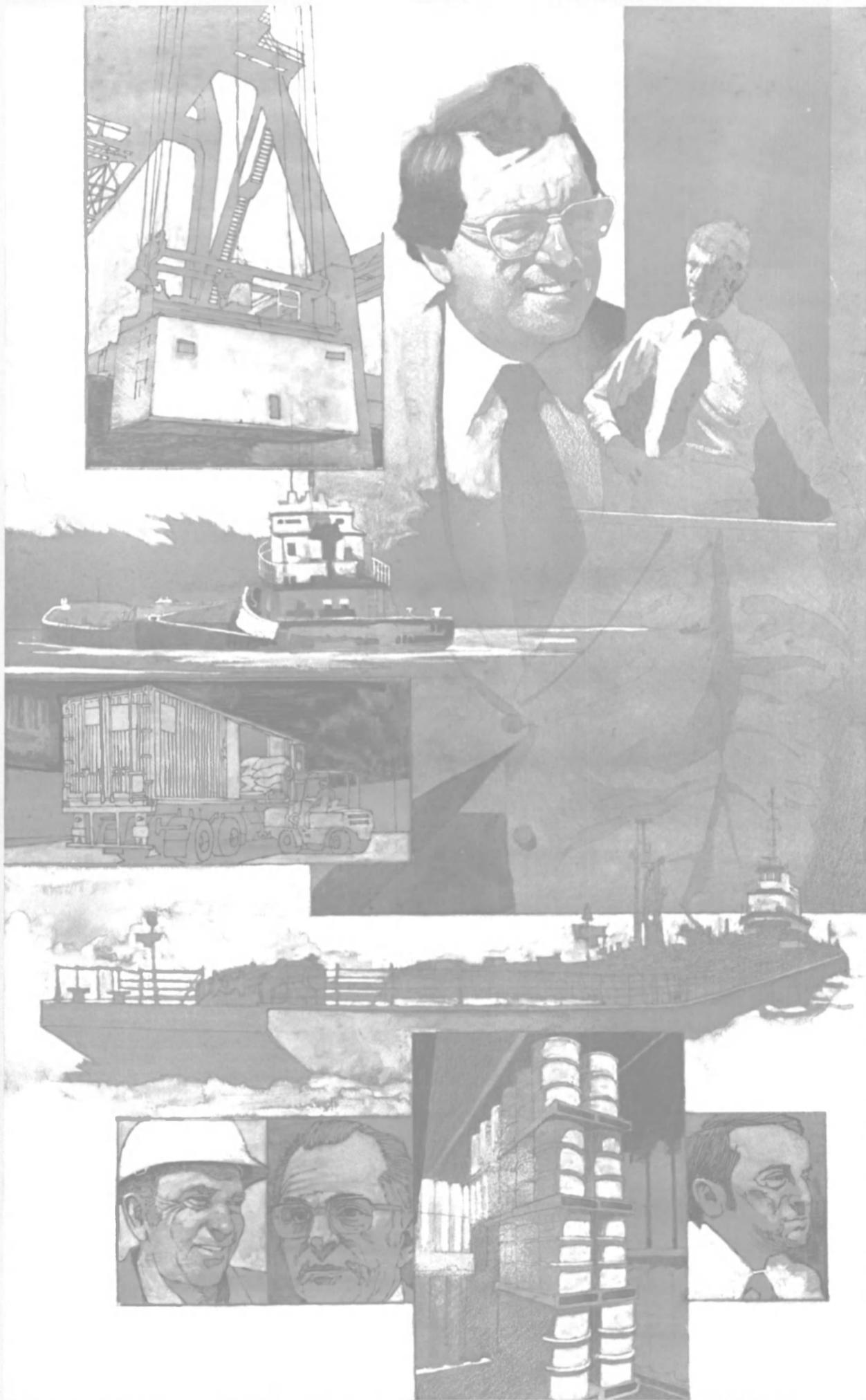
The Senator Eastland towboat begins a new decade of fuel-efficient service with GE 12-cylinder diesel engines. According to Lea Brent, President, Brent Marine Supply, "repowering of the Senator Eastland with GE engines is expected to result in a \$6 to 10 million fuel savings over the vessel's life."

This prediction results from a fuel efficiency improvement of 21% achieved by replacing the original roots blown engine with a 4-cycle turbocharged design enhanced by improvements to the intercoolers, exhaust system, pistons, liners, and turbochargers. Also incorporated in the engine are features which improve reliability and reduce operating costs. For maintenance simplicity, the engine allows easy accessibility and maximum standardization.

The GE engine—a vital part of Senator Eastland and the decades of fuel-efficient service it will provide. For more information, contact Manager, Diesel Power Products, General Electric Company, Erie, PA 16531, (814) 455-5466 or Brent Marine Supply, Greenville, MS, (601) 378-2200 or 378-9100.



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Diesel Power Review

(continued from page 30)

previous one, had very good ignition properties. Second, a perfectly normal picture regarding engine cleanliness showed up at all inspections. Up to 10 percent load, absolutely nothing happened; at 10 percent load at full rpm, slight blackening occurred in the inlet passage, which disappeared after brief full-load operation.

These trials have only recently been completed and many details still have to be evaluated. Summarizing the test results, SWD reports that, although the consequences of using "future fuels" must not be underestimated, their design characteristics place the TM 410 and TM 620 engines in a favorable starting position for being able to burn these products in a reliable manner.

Sulzer Brothers Limited

The keen interest shown in Sulzer's complete RL engine family is reflected by the continuous flow of new orders for these types. Some of the latest orders for the newly introduced RL 66 and RL 76 engines, as well as for the RLB ratings, received up to May 1 this year demonstrate the success of this design.

One 6RL56 engine, to be built in Sulzer's own factory in Winterthur, Switzerland, with a rating of 9,000 bhp at 170 rpm will power a 20,000-dwt products carrier ordered by Misano Soc. di Navigazione, Ravenna, from Nouvi Cantieri Apuania, Marina de Carrara, Italy.

Of nine 6RLA66 engines, six with a rating of 11,100 bhp at 124 rpm and three with a rating of 11,850 bhp at 136 rpm, three will be built by Mitsubishi, one by IHI, and four by Sumitomo for different clients, and one engine will be built by Sulzer for an oceangoing self-unloader ordered by Canada Steamship Line of Montreal from Collingwood Shipyard, Ontario, Canada.

Three 7RLA66 engines with a rating of 12,950 bhp at 124 rpm will be built by Mitsubishi; one of these is destined for a 35,000-dwt tanker ordered from Imbari Zosen.

One 6RLA76 engine with a rating of 14,700 bhp at 106 rpm will be built by Horton or Norway to power a 30,000-cubic-meter LPG/Ammonia/VCM carrier ordered by Sig. Bergesen d.y. of Oslo from the Norwegian shipyard Moss Rosenberg Verft A/S. And one engine with a rating of 14,400 bhp at 122 rpm will be built by IHI.

With the continued success of the RLA90 and RLA56 engines, the above listed additions brought the total number of RL engines on order to exactly 100.

Transamerica Delaval

Shipbuilders in nations where

oil was in short supply adopted the diesel alternative years ago. Today, more than half of the new commercial ships over 1,000 gross tons entering American service have followed suit—an indication of a new maritime era of energy economics.

Delaval R and RV four-cycle diesel engines operating in the 450-rpm range have achieved a long and successful record pow-

ering vessels from tugs to tankers for many years under the familiar product name Enterprise. As early as the 1940s, the original configuration was modified by the Maritime Commission to burn heavy fuel.

Now providing the highest horsepower rating of any medium-speed diesels manufactured in the U.S., this family of reliable engines is well suited for its ex-

panding role in marine service. Its units are more rigid and rugged, shorter in length, conservatively rated, and have excellent maneuvering control flexibility and lower lube oil consumption.

Six Delaval RV-12 engines, each rated at 7,800 bhp, will power the three bulk carriers under construction at Levingston Shipbuild-

(continued on page 34)

PROTECTION AGAINST BURNOUT PROMISES GREATER RETURN ON INVESTMENT

Critical motors and generators represent a substantial investment for all shipping companies. Until now, no protection was available for idle electrical machinery when moisture, salt, oil and grease break down insulation resistance.

Failsafe, a new early warning device, steps in with comprehensive protection that promises to slash operating budgets for all ships. Failsafe is a compact add-on unit easily mounted by a qualified electrician within starter enclosures or switchboards with no modifications. By measuring insulation resistance between windings and earth, the unit ensures constant surveillance, tripping an alarm when resistance levels fall below pre-set requirements, and providing start prevention or start prevention with emergency override as two important options. Maintenance crews are alerted to low resistance by this early warning device. First startup could be the last before a spot burnout; instead of expensive rewindings and costly delays, a simple maintenance procedure can virtually eliminate burnouts of this nature for years to come.

A recent experience on board Marine Bulk Carriers' **Morazan** out of Miami illustrates the cost-effectiveness of Failsafe. When the Failsafe unit on a cargo boom motor alerted the maintenance crew to a problem, a simple maintenance procedure was followed and the problem was solved. "We were right on schedule," says company president S. Ziv. What began as a first-stage protection of 14 of the **Morazan's** motors has swelled to a complete commitment to protect all motors and generators. "With the savings it brings in both repair costs and downtime," Ziv concludes, "Failsafe is a real boon to the maritime industry."

The versatility of Failsafe applications covers a wide maritime market. AC motors operated by starter, contractor or shunt-trip circuit breakers and generators up to 600V can be protected. High voltage units up to 13.8 KV will be available for off-shore platforms. Full details of this significant protection device are available from the manufacturer, Marine Safe Electronics of Canada Ltd., 101 Jardin Dr., Concord, Ont., Can. L4K 1B6.

EARLY WARNING

FAILSAFE
MOTOR/GENERATOR PROTECTOR

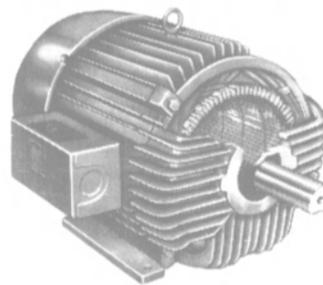
*Patent Pending

PREVENTS MOTOR/GENERATOR BURNOUTS

Caused by Insulation Breakdown

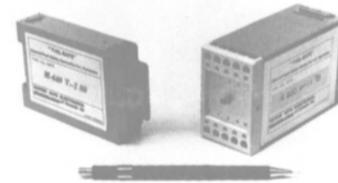
Ask about our 5-YEAR GUARANTEE!

The Problem



Failure of insulation is far and away the primary cause of burnouts in modern AC machines. While shipboard motors and generators are idle, their insulation is subject to continuous contamination and degradation. The burnout, when it comes, usually occurs a few seconds after start up. When it is an *essential* motor or generator, the costs are enormous: Expensive rewinding is needed and delays and safety hazards result — which all add up to unscheduled downtime and over-budget expenditures.

The Solution



The **FAILSAFE** Motor/Generator Protector is an *Early Warning* device for most AC motors and generators. The compact, solid state unit continuously monitors insulation resistance in the idle machine. When it falls below a pre-set level (e.g. 1 meg), **FAILSAFE** triggers an Early Warning alarm and/or prevents starting. Any maintenance crew can then clean dry and revarnish the coil as necessary. Preventive maintenance forestalls the burnout and its inevitable delays, frustrations and over-budget expenditures!

Approved and Accepted by:

The **FAILSAFE** Motor/Generator Protector (Patent Pending) is approved and/or accepted by American Bureau of Shipping (ABS), U.S. Coast Guard, Lloyd's Register of Shipping, Germanischer Lloyd, Det Norske Veritas and is U.L. — listed.

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ing Company for Livingston Falcon I Shipping Company. And twin RV-16s, each rated at 9,100 bhp, will propel each of the three catamaran tugs that Halter Marine is building under subcontract from Bethlehem-Sparrows Point, who is building the barges for the three tug/barge units.

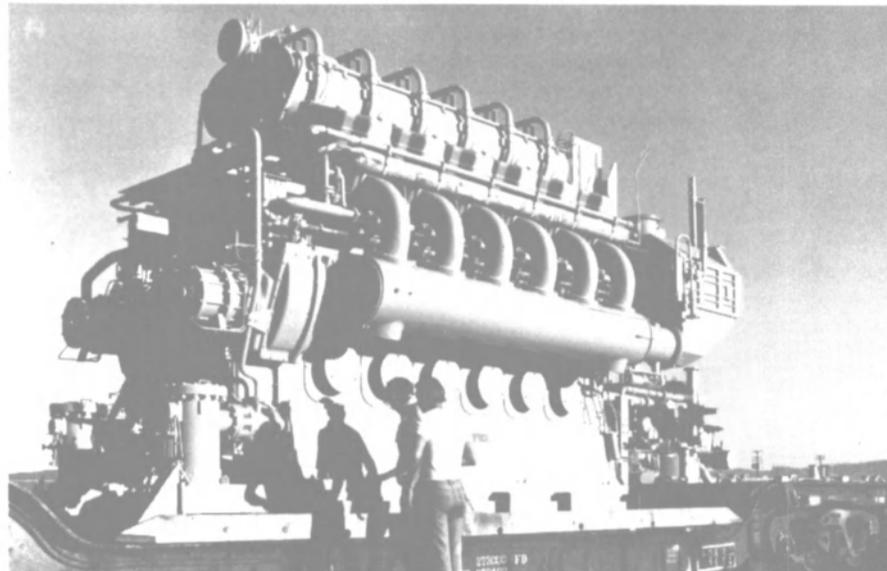
Delaval is also supplying the diesel generators for the three American President Lines container ships under construction at Avondale Shipyards. Designed to operate on heavy fuel, these generators are 2,500-kw DMR46, in-line medium-speed units.

Wartsila Diesel Division

One of the leading manufacturers of medium-speed diesel engines is the Wartsila Diesel Division, which today includes Nohab Diesel AB, Trollhattan, Sweden; the Vasa Factory in Vasa, Finland; and the diesel engineering department of the Turku Shipyard in Turku, Finland, which manufactures heavy medium-speed engines and low-speed diesels under license.

The Division belongs to the Wartsila Group, which is one of the biggest privately owned enterprises in Finland with 14,000 employees and production plants at 12 different sites all over the country, and is one of the world's leading shipbuilders, concentrating on icebreakers, car/passenger ferries, and cruise liners.

Early in 1980 Wartsila Power,



Two of these Enterprise RV-12 engines will power each of three bulk carriers under construction at Livingston yard.

Inc. was established in New Orleans, primarily to service the close to 200 Nohab F-type engines that are in operation in North America, as well as to promote the sale of Nohab engines and introduce Wartsila-Vasa engines.

Nohab Diesel AB follows a long tradition in designing, developing, and manufacturing diesel engines. During an 80-year period, Polar and Nohab engines have been produced in a wide range of different engine types, but since 1969 Nohab has concentrated on developing a medium-speed engine series with only one cylinder size throughout. The F-type engine is a 4-stroke, trunk type diesel with a bore of 250 mm and a stroke of 300 mm. During the fall of this year the next development step, the F30 generation,

is being introduced in the North American market.

The design parameters of the new F30 engine were governed by the following requirements: high service reliability, foolproof systems, installation simplicity, and wide exchangeability of engine components with respect to all F-type engines delivered during the years.

Diesel engine production at Wartsila-Vasa in Finland began in 1955 when the factory started to manufacture auxiliary engines under license. The design of a diesel engine of its own began in the late 1950s, and the first engines of the Vasa 24 type were marketed in 1960. To date, the Vasa factory has delivered more than 1,900 engines.

The main product at the Vasa

factory today is the Vasa 32, which is a heavy-fuel engine with a bore of 320 mm and a stroke of 350 mm, with a maximum output of 5,760 kw (7,725 bhp) in the speed range of 720-800 rpm. The Vasa 32 is produced in 4-, 6-, 8-, and 9-cylinder in-line versions, and in 12-, 16-, and 18-cylinder V engines. It is intended primarily for marine propulsion and land power generation, but has also found a market for auxiliary purposes, especially when the auxiliaries are to run on the same fuel as the main engines.

Serial production of the Vasa 32 was started in 1978, and today more than 100 engines have been delivered for marine production and auxiliary purposes in vessels built in Norway, Sweden, Germany, Holland, Japan, South Korea, and Finland.

Wartsila's latest development is the Vasa 22HF engine, which is also a heavy-fuel engine capable of burning MFO (1,500 Sec. R1). This engine has a bore of 220 mm and a stroke of 290 mm, and has a per cylinder output of 150 kw (200 bhp) at 1,000 rpm. Cylinder numbers from 4 to 16 cover an output range from 600 to 2,500 kw (805 to 3,350 bhp). The first engines of this new design will be delivered in 1981.

Waukesha Engine Division

Within the past year, Dresser Industries' Waukesha Engine Division has delivered units of its new 9 1/8-inch bore series marine engine for several applications. These include generator service for a U.S. dredge and a North Sea offshore platform, as well as for propulsion duty in a Rhine River barge.

The new 6- and 12-cylinder marine diesel of 232 mm bore with maximum bhp ratings of 1,021 and 2,042, respectively, at 1,215 rpm, are available in either turbocharged and intercooled, or naturally aspirated configurations.

Typical standard equipment includes heat exchanger and oil cooler with removable tube bundle for ease of maintenance; pre-lubrication system for reliability; shielded high-pressure fuel injection lines for safety; and variable fuel injection timing for smooth operation at variable speeds.

The 6-cylinder engine, Model F3335DSIM, has a bore and stroke of 9.125 by 8.5 inches (232 by 216 mm) and a displacement of 3,335 cubic inches (54.6 liters). The 12-cylinder Model L6670DSIM has the same bore and stroke and a displacement of 6,670 cubic inches (109.3 liters).

The installation in the Army Corps of Engineers hopper dredge under construction at Avondale Shipyards involves three Waukesha VHP6700DSIM Enginators® generating sets, which utilize the L6670DSIM engines. These are the first Waukesha engine/generators to be installed in a U.S.

(continued on page 36)

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Drydocking facilities as follows:

	LxBxD (in feet)	dock capacity in D.W.T.
Graving dock no 1	463 x 65.7 x 19.0	10.000
Graving dock no 2	548 x 72 x 21.0	18.000
Graving dock no 3	676 x 88 x 28.0	32.000
Graving dock no 4	817 x 120 x 28.0	72.000
Floating dock no 5	620 x 83 x 29.0	27.000
Floating dock no 6	705 x 97 x 28.0	41.000

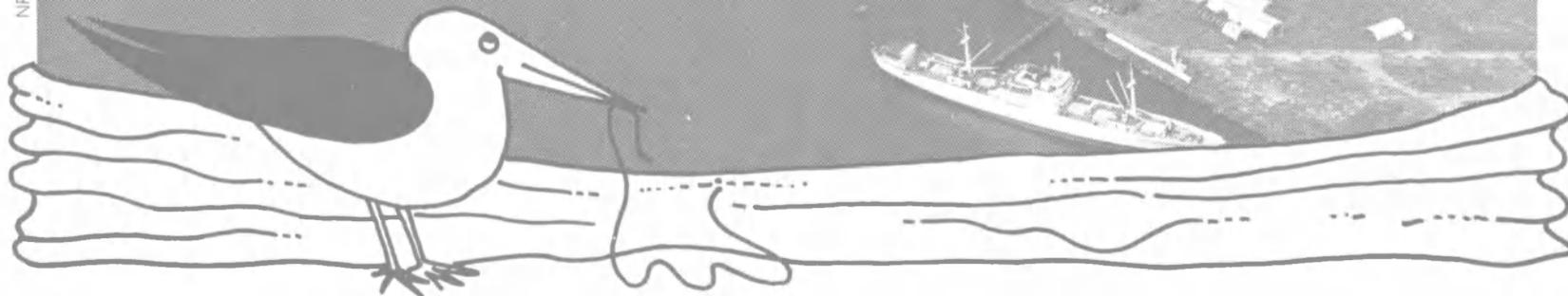
Total quay length 5.500 ft. equipped with 8 cranes up to 60 tons, waterdepth 9,5 mtr.



Amsterdam Drydock Company
Amsterdamse Droogdok
Maatschappij BV
P.O. Box 3006
1003 AA Amsterdam
telephone: 020-5 2099 11



NPP 860



Diesel Power Review

(continued from page 34)

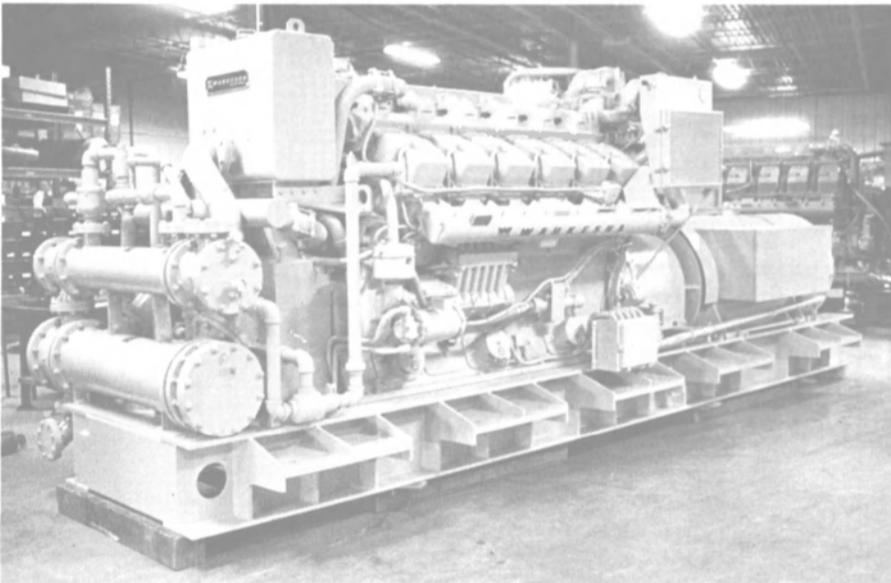
vessel of this type. The dredge, scheduled for delivery in September 1981, will be operated by the Corps' New Orleans District.

These generators will provide all electrical power on the ship except that required to run the dredge pumps, which will be powered by other generators. Each of the VHP6700DSIM units is rated 1,000 kw for continuous operation at 1,200 rpm. A fourth Waukesha generating unit, Model VS900DSM rated 150 kw at 1,800 rpm, will provide emergency standby power for the dredge.

The North Sea platform engine/generator is a 12-cylinder L6670DSIM rated 1,000 kw at 1,200 rpm, while the Rhine River barge propulsion engine is a Model F3335DSIM rated 88 bhp at 1,215 rpm.

Some noteworthy installations within the past year involving other Waukesha marine engines include five 12-cylinder L5792-DSIM engines, each rated 1,420 bhp, for bow thruster service on Spanish cargo vessels, two Model L5792DM engines that will be packaged into generators for ship's service on an oil company motor vessel based in Canada, and two H867DSIM V8 engines, each rated 300 bhp at 1,900 rpm, for main propulsion duty on a Mississippi River pushboat.

Waukesha's VHP marine engine line ranges from 416 to 1,636 continuous bhp at 1,215 rpm, with ship's service electric sets available up to 1,150 kw at 1,200 rpm. Its smaller, mid-range line series marine diesels are rated up to 348 continuous bhp at 1,900 rpm for propulsion, and 235 kw at 1,800 rpm in ship's service generator sets.



This Waukesha diesel generator is one of three that will provide ship's power for Corps of Engineers dredge building at Avondale.

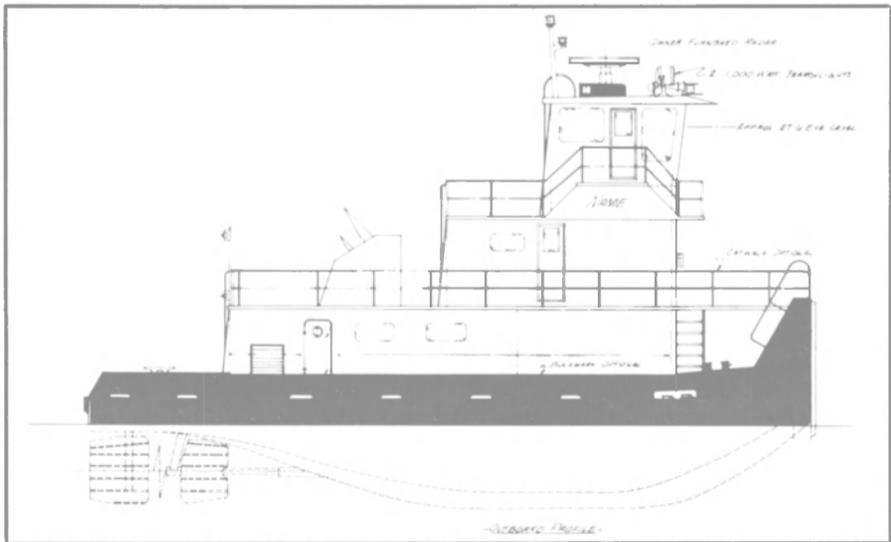
Dravo SteelShip To Build Two Pushboats

Dravo SteelShip Corporation recently announced the addition of two vessels to its stock boat program. Construction is scheduled to begin shortly on two identical 65-foot by 27-foot by 7-foot pushboats. The first vessel should be ready for customer delivery in

May 1981, and the second vessel is scheduled for completion in June 1981.

The deck is heavily braced with $\frac{3}{8}$ -inch plate except at the headlog and over the running gear which will be of $\frac{1}{2}$ -inch plate.

The vessels are to be powered



Outboard profile of pushboats to be built by Dravo SteelShip.

by twin General Motors 16V-92 diesel engines rated at 1,200 shp and equipped with Twin Disc MG527, 5.17:1 reduction gears. Fernstrum grid coolers are to be installed for the main engines.

The electrical system will be powered by two General Motors 4-71, 50-kw generator sets which will produce power for all ship-board use.

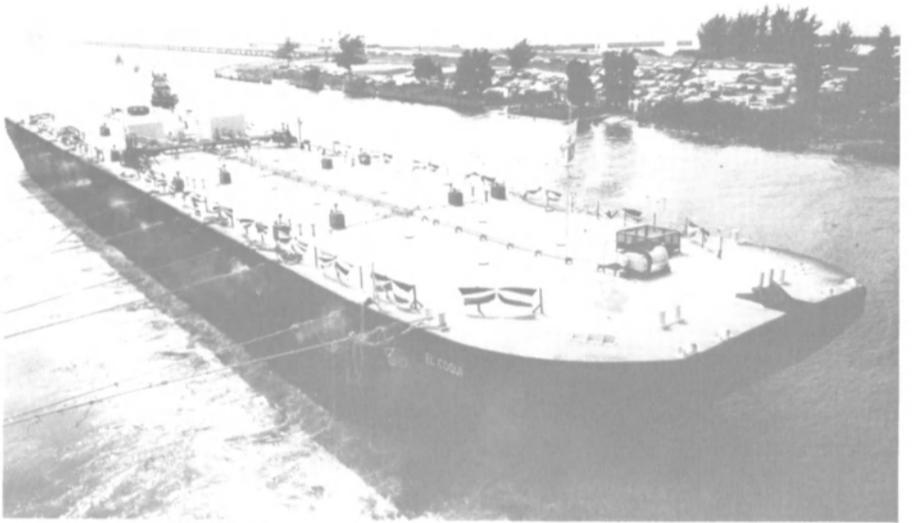
As is standard on all Dravo SteelShip towboats, the vessels will be provided with a soft patch to facilitate removal of principal machinery.

The vessels are to be equipped

with two steering and four flanking rudders along with two 60-inch, four-blade, stainless-steel propellers.

Each towboat will have two fuel tanks with 13,000 gallon capacity, a 4,000-gallon potable water tank, a 500-gallon lube oil tank and a 500-gallon slop oil tank.

Dravo SteelShip Corporation currently has two 110-foot spud barges, two 75-foot coastal tugboats, two 60-foot crane workboats, three 88-foot towboats and several other pieces of marine equipment under construction.



The El Coqui, a 380-foot oceangoing tank barge, owned by the Bacardi Corporation, was delivered recently by Misener Industries, Tampa, Fla. The Bacardi barge has many special features, and is the 50th barge completed by Misener Industries in less than five years of operation.

Misener Reaches Milestone With Delivery Of 'El Coqui'

The 50th barge built by Misener Industries, the El Coqui, was delivered recently to its owner, the Bacardi Corporation, San Juan, Puerto Rico.

This launch marked a milestone for the Tampa-based barge construction firm. Misener was founded in August 1975, and according to president Richard E. Goerlich Jr., has in these five years built two tugs in addition to the 50 barges.

Mr. Goerlich stated that Misener Industries is now the largest barge construction facility in Florida, with more than 300 employees. The firm will generate gross revenues of more than \$20 million in 1980, he said, which will be an increase of \$8 million over 1979.

The El Coqui is a 380-foot, oceangoing tank barge; it will be used by the Bacardi Corporation to carry molasses and edible oils throughout the Caribbean. The Bacardi barge measures 380 by 70 by 26 feet and has many special features such as double-bottom construction, self-contained

pumping units, and full coating both inside and out.

The El Coqui was christened by Mrs. Maria Lourdes Nielsen, wife of the chairman of the board of Bacardi Imports of Miami, Fla. The traditional bottle of champagne was replaced by a bottle of Bacardi rum for the ceremony, which was attended by the full board of directors of the Bacardi Corporation.

Ship Production/Planning Course Will Be Held At UoM On October 26-31

A short course in ship production and planning will be held October 26-31 at the University of Michigan in Ann Arbor. Sponsored jointly by the Maritime Administration, Sea-Grant, and an informal consortium of private shipyards, the course will feature speakers drawn largely from Ishikawajima-Harima Heavy Industries (IHI).

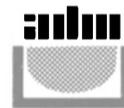
For further information telephone Professor Howard Bunch at (313) 764-6504 or (313) 764-8422.

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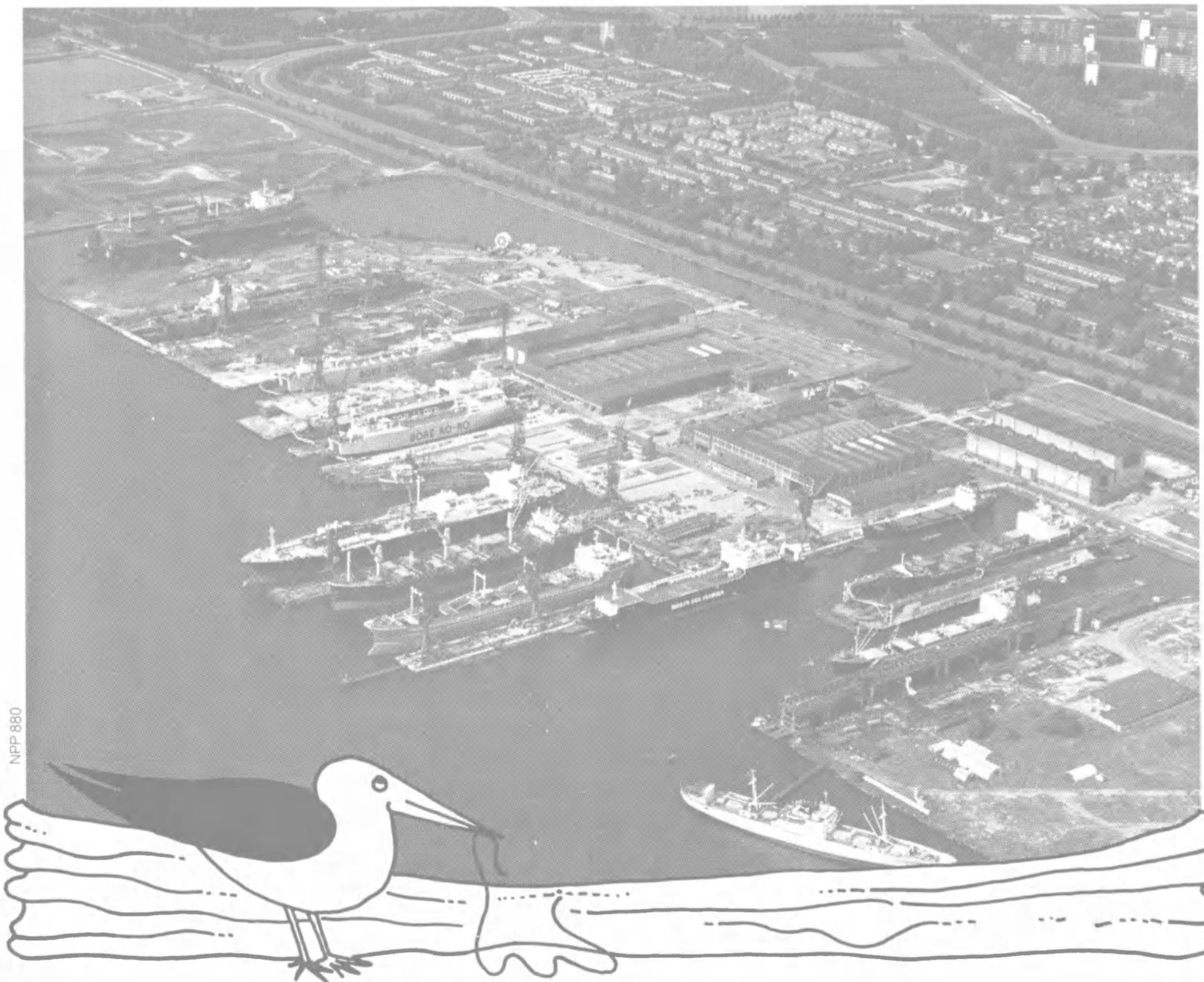
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Total quay length 5.500 ft. equipped with 8 cranes up to 60 tons, waterdepth 9,5 mtr.



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Maatschappij BV
P.O. Box 3006
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telephone: 020-5209911



NPP 880

Diesel Power Review

(continued from page 34)

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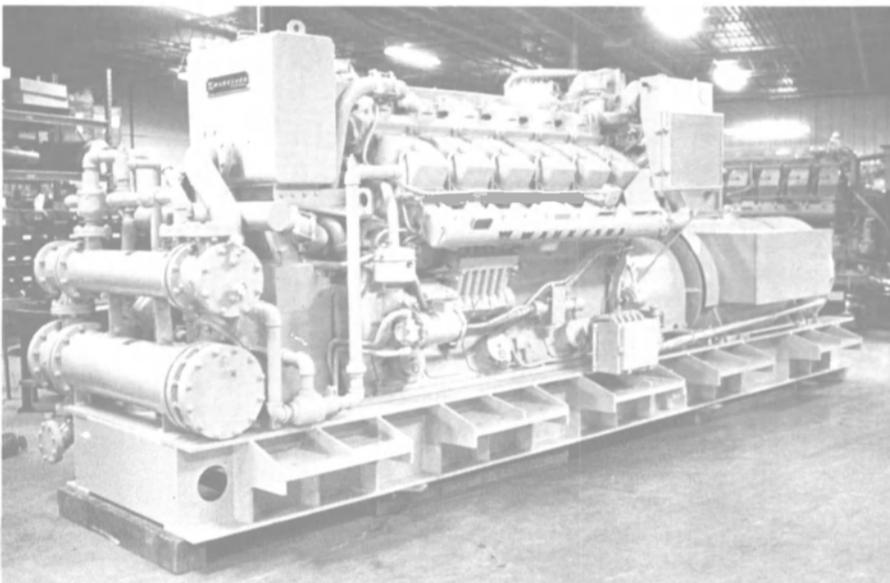
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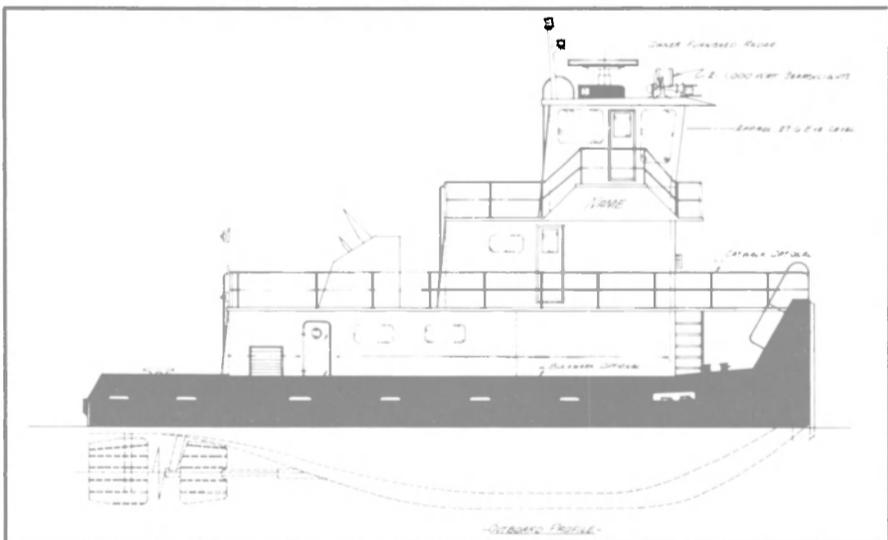
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For further information telephone Professor **Howard Bunch** at (313) 764-6504 or (313) 764-8422.



Outboard profile of pushboats to be built by Dravo SteelShip.

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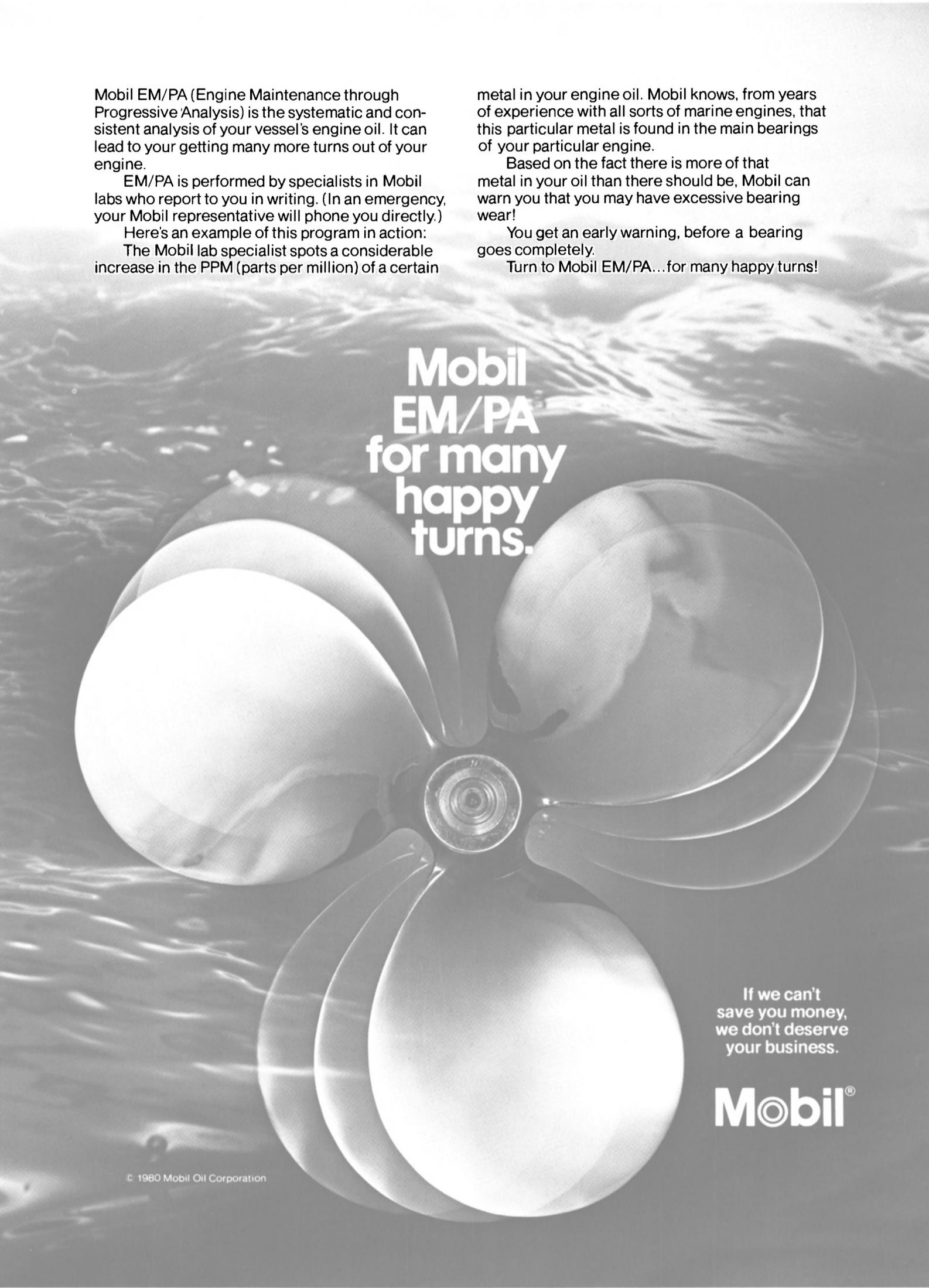
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metal in your engine oil. Mobil knows, from years of experience with all sorts of marine engines, that this particular metal is found in the main bearings of your particular engine.

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**Shearson Seeks Title XI
On \$17.5-Million Order
For 65 Hopper Barges**

Shearson River Barge Associates I, II, VI, and VII, New York, have applied to the Maritime Administration for Title XI guarantees to aid in financing the construction of 65 hopper barges for

operation on the inland waterways of the United States.

Twenty 200-foot barges are to be constructed by Nashville Bridge Company, Nashville, Tenn., and Cargo Carriers, Inc., Minneapolis, Minn. If approved, Title XI financing would cover \$4,377,000, or 87½ percent of the estimated actual cost of \$5,003,374.

Thirty 195-foot barges are to be constructed by Dravo Corporation, Pittsburgh. If approved, Title XI financing would cover \$6,995,000, or approximately 87½ percent of the estimated cost of \$8,225,250. The remaining 15 vessels are to be built by Jeffboat, Incorporated, Jeffersonville, Ind., and Proform, Inc., Minneapolis, Minn. If approved, Title XI fi-

nancing would cover \$3,747,000, or 87½ percent of the estimated cost of \$4,282,500.

Deliveries of all of the barges are scheduled by early 1981.

**Jack Dunn Appointed
President-General Manager
Of Towler Hydraulic Group**

Tom White, subgroup general manager of The Towler Hydraulic Group, Leeds, England, has announced the appointment of Jack T. Dunn as president and general manager of Towler Hydraulics, Inc. of Urbana, Ohio, a unit of Thorn/EMI Group. The Towler Hydraulic Group is a major British manufacturer of hydraulic components and systems, with manufacturing and assembly plants in the United Kingdom, Germany, Spain and the United States.

Mr. Dunn previously was president of The Dixie Dredge Corporation, a subsidiary of St. Louis Ship.

**Dean Willard Named
President Of Products
Research & Chemical**



Dean M. Willard

George Gregory, chairman of the board and chief executive officer of Products Research and Chemical Corporation (PRC), Glendale, Calif., has announced that Dean M. Willard is elected president and chief operating officer. Mr. Willard, who had been senior executive vice president of the company, joined PRC in 1972 as vice president, administration. He will continue to be chief financial officer, a post he has held for several years.

Mr. Gregory, who continues as chairman of the board and CEO, indicated that this appointment was made to provide for the major business expansion PRC plans over the next several years. He will devote more of his time to areas of major business strategy, planning, and market development. Mr. Willard will be responsible for the day-to-day operations of the company.

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Sperry's new CAS II™ collision avoidance system — its computerization provides its simplicity. Microprocessors control all CAS II functions. Uncomplicated, push-button operation continuously supplies all the vital information needed for safe navigation. And built-in self-test equipment precisely identifies any deviation from normal operation.

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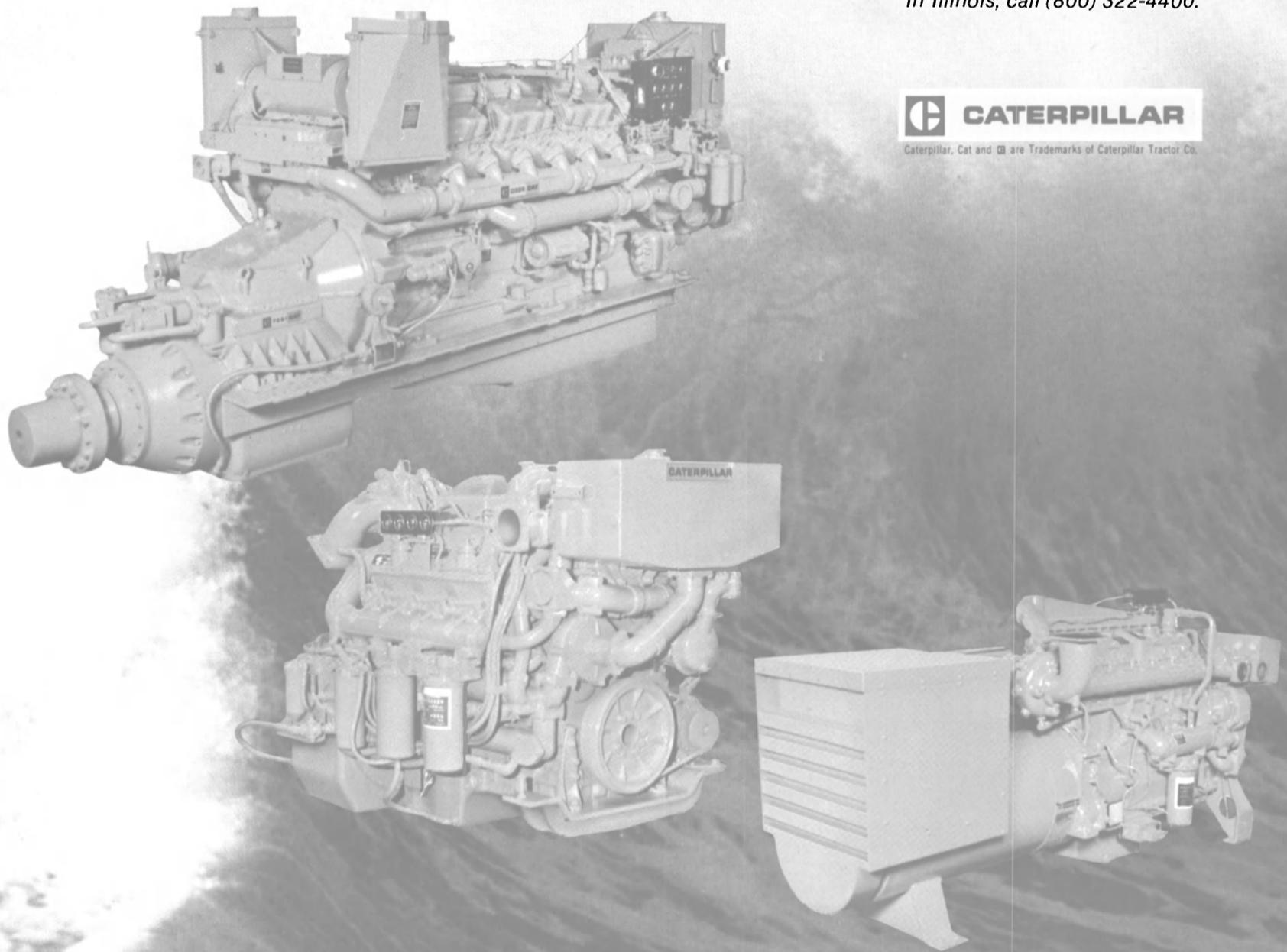
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Participants in the keel-laying ceremony included (from left): John Murphy, vice president, corporate relations, NASSCO; John McCoy, American Bureau of Shipping representative; Capt. Stanley Wetherell, U.S. Coast Guard; George Stiehl, manager, new construction, Union Oil Company; Darrell Beshears, welding foreman, NASSCO; Nick Nickerson, West Coast shipping construction representative, and John Smith, vice president, yard operations, NASSCO.

Keel-Laying At NASSCO Held For Third Union Oil Product Carrier

The recent keel-laying ceremony at National Steel and Shipbuilding Company (NASSCO), San Diego, Calif., initiated construction on a third 37,500-dwt product carrier being built by NASSCO for Union Oil Company of California.

George Stiehl, manager of new construction, Union Oil Company, struck the initial arc, signaling the beginning of construction. John Smith, vice president, yard operations, represented NASSCO in the keel-laying ceremony.

The product carriers are a new NASSCO design designated as the Carlsbad Class. They will be 658 feet in length, 100 feet in beam, have a 33-foot draft, and will carry 250,000 barrels of refined petroleum and petrochemical products from refineries to distribution centers.

The vessels will incorporate the most modern equipment available, and will meet the latest safety and environmental protection standards including double bottoms, a clean segregated ballast system, an inert gas system, a sewage treatment plant, collision avoidance radar, and a backup steering system. They will have steam turbine engines for maximum fuel efficiency and conservation.

The first product carrier is scheduled for delivery in May 1981, the second in July 1981, and the third in October 1981. The vessels will be used to trans-

port oil products from Union Oil's Beaumont, Texas, refinery to terminals on the Gulf and Atlantic Coasts.

Dravo SteelShip Delivers M/V Boone To Cincinnati Gas And Electric

Dravo SteelShip Corporation, Pine Bluff, Ark., recently delivered the M/V Boone to Cincinnati Gas and Electric Company for use at its East Bend Station, a coal and lime facility located on the Ohio River near Rabbit Hash, Ky.

The Boone is a 60 by 22 by 7.5-foot towboat equipped with twin Caterpillar 3412 marine engines developing 900 hp. The engines are cooled by Fernstrum grid coolers. Caterpillar 3306, 45-kw,

electric start generator sets power the electrical system which includes Beebe 33-RC deck winches, Carlisle & Finch searchlights, as well as other pieces of equipment.

The vessel is equipped with two 62-inch by 34-inch, four-blade bronze propellers furnished by Michigan Wheel. Two steering and four flanking rudders provide for maneuverability and speed. The heavily braced and frame hull is fabricated of 3/8-inch plate, deck plating is 1/4-inch. The Boone carries 8,000 gallons of fuel.



The M/V Boone, shown above, is powered by twin Caterpillar 3412 marine engines. The vessel, built by Dravo SteelShip, was recently delivered to Cincinnati Gas and Electric for use at their coal and lime facility on the Ohio River.

Instant Relief from IMCO Radio Monitoring from Electro-Nav

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It's our new EN 2182R Watch Receiver. We designed it to meet or exceed the very latest SOLAS 74/IMCO A.383 round-the-clock distress monitoring directives, and the pertinent requirements of just about every maritime regulatory agency in the world, CEPT, UK Home Office, Scandinavia's PTT, USA's FCC, you name it. And it's available right now, so you can forget about having to apply for additional extensions.

EN 2182R is compact, rugged, reliable, real state of the art. And fully flexible. With normal and muted operation. Integral loudspeaker and built-in



test generator. Plus provisions for external speakers, alarm indicator and reset controls. And an optional digital clock which automatically lifts mute during silent periods. This watch receiver will mount anywhere, table, bulkhead, or overhead, so it won't get in your way. It operates on both AC and DC; all you do is plug it in and it's ready to go.

The low cost is also a relief. Especially since no unit anywhere near the price of the EN 2182R comes anywhere near its performance. And it comes with a full year's guarantee. So here's an easy way to get rid of a headache — before it starts. Call Electro-Nav today.

Electro-Nav
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Telex: (851) 928229

**Southern Marine Seeks
Title XI For \$25.9-Million
Jackup Drilling Rig**

Southern Marine of Corpus Christi, Texas, has applied for a Title XI guarantee to aid in financing the construction of a jackup drilling rig. Southern Marine is a joint venture of Southern Marine Drilling Company, John D. Hawn, Inc., George S. Hawn, Inc., the A & P Marine, Inc.

The company plans to operate the 250-foot-long rig in the Gulf of Mexico. The builder, Baker Marine Shipyard of Ingleside, Texas, is expected to deliver the

Freeport, Texas, as the authorized dealer of Carrier Transicold marine and industrial air-conditioning/refrigeration products in the Gulf Coast area.

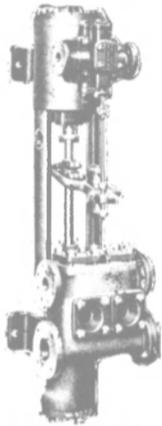
Carrier equipment is manufactured to marine, military, and nuclear specifications with the heavy-duty difference. A leader and innovator in transport refrigeration and air-conditioning for decades, Carrier Transicold products are specially designed and constructed for operation in punishing marine and offshore environments.

As the authorized sales and service center for Carrier Transicold in the Gulf Coast area, Maencor will feature the marine

water/air-cooled condensing unit series and the Dolphin marine refrigeration systems. Because Carrier Transicold products are engineered and manufactured with demanding applications in mind, they are said to provide the advantages of increased efficiency, and lower operating and maintenance costs.

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**UNUSED WORTHINGTON
VERTICAL SIMPLEX PUMPS**

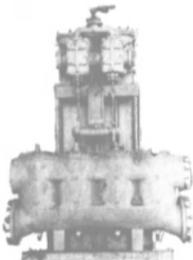


8 to 20 GPM—up to 350#. Also suitable for small boiler feed service. Steam WP 220# and 10# exhaust.

for Liberty Ships EC-2 & Victory Ships VC2, AP2 & AP3. (Fuel oil service) Liquid capacity from 7½ x 4 x 10—3" suction—2" discharge—1¼" steam—1½" exhaust. OAH 5'2"; OA depth 23"; OAW over air dome 2'2". Weight about 800#. Suitable

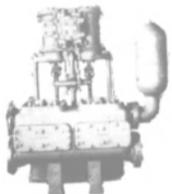
\$1195

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



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

**STEAM DRIVEN VERTICAL DUPLEX
FIRE & GENERAL SERVICE PUMPS**



10 X 11 X 12 — Worthington — 560 GPM @ 125# G. 8" Suction — 6" discharge pumps bronze fitted.

8" X 8" X 10" VERTICAL DUPLEX PUMP



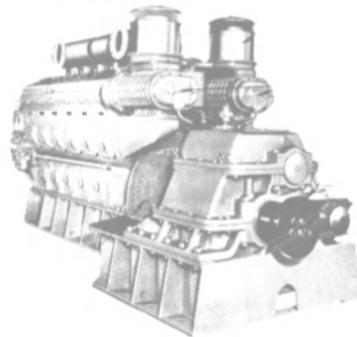
Hendy design Suction 8" — discharge 6" — 160 GPM @ 100 PSI.

**PRACTICALLY
NEW**

100,000 LB. ALMON JOHNSON

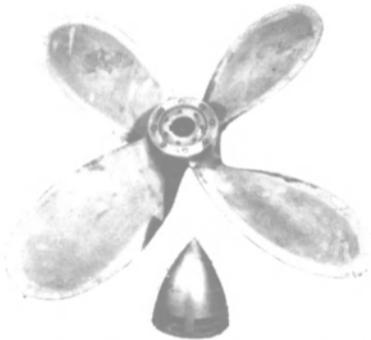
**MATCHED PAIR GM 12-567A
900 HP DIESEL ENGINES**

with Falk reverse & reduction gear



ENGINE: GM 12-567A—8½X10—VEE type—2-cycle—747 RPM—electric starting—serial Nos. 1041 & 1060. GEAR: Falk Air Flex—reverse & reduction—2.48:1 forward—2.52:1 reverse.

4-BLADE LST BRONZE PROPELLERS



Starboard — 7' diameter — pitch constant 4.699: Bore tapers from 6⅞" to 4⅝¼". 14½" taper equal to 1"/foot on diameter. U.S. Navy reconditioned. Average weight 1760 lbs.

**RECONDITIONED—GUARANTEED
DELAVAL
PURIFIERS**



LUBE OR FUEL OIL

225 G.P.H.

55N-13 (Lube Oil)
55N-23 (Fuel Oil)

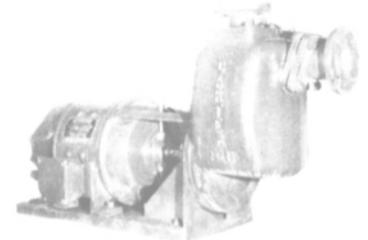
300 G.P.H.

65N-13 (Lube Oil)
65N-23 (Fuel Oil)

2 HP — 440/3/60/1750 RPM —
Frame 224

**STEAM MOORING WINCHES
12" x 14" — AUTOMATIC TENSIONING
with foot brake & declutchable gypsy head
20,000 LBS @ 100 FPM—FIRST LAYER**

**CARTER BRONZE SELF-PRIMING
BILGE & GEN. SERVICE PUMP**



85 GPM @ 50 lbs. — 3500 RPM — 2" X 2". 5 HP —
115 VDC — 1750 RPM motor.

\$1466

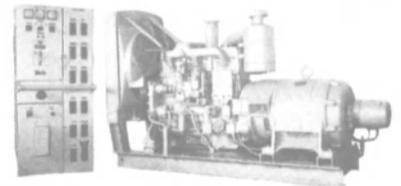
**COFFIN
FEED PUMPS
— ALL SIZES —
TYPE DE**



**3 TYPE DE-2
540 GPM 1870' NET HEAD**

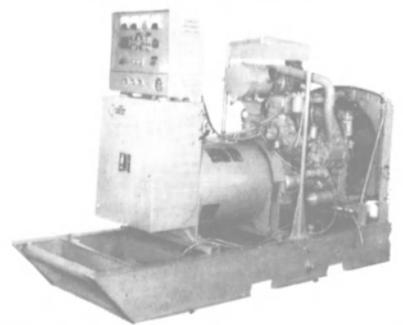
8450 RPM — 585 PSIG — 0°-200° superheat — exhaust
pressure 15 lbs — NSPH 30 — typical serial 4683DE

**CUMMINS 75KW 93.8 KVA
DIESEL GENERATOR SET**



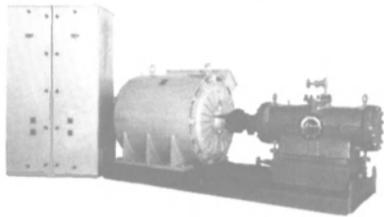
440/3/60 Generator—1200 RPM—driven by 6-cylinder
Cummins diesel with electric starting. Free standing
switchgear.

**GM 4-71-T TURBO-CHARGED
100 KW 440/220/3/60
10 WIRE DIESEL GENERATOR SET
ALL VOLTAGES POSSIBLE**



100 KW 440/220/3/60 generator driven by GM 4-71-T
radiator cooled turbo charged diesel. P.F. 0.80—for T-2,
10 wire

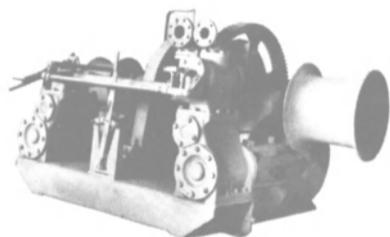
700 G.P.M. @ 150 P.S.I.
NEW — UNUSED
**MOTOR DRIVEN ROTARY
HORIZONTAL PUMPS
WITH 4-SPEED 440/3/60 MOTOR**



Inlet 8" — outlet 6". Powered by 4-Speed 440/3/60 motor. Motor is 100/75/50/37.5 HP — 1200/900/600/450 R.P.M. Motor has Cutler-Hammer control. Weight 10,000. Inquire for complete details.

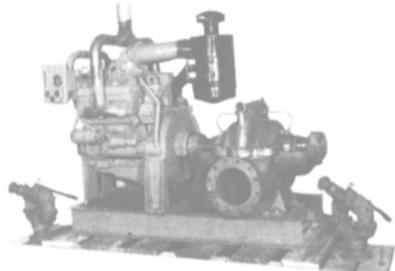
**9 X 12 2-SPEED ALL-STEEL
STEAM WINCHES**

for use as General Service or
MOORING WINCHES
20,000 LBS @ 110 FPM—7,450 @ 250 FPM



DRUM CAPACITY: 1250' of 1" wire in 9 layers or 2200' of 3/4" in 12 layers. Weight 11,300 lbs. DRUM DIMENSIONS: 22" diameter—20" between flanges; flange diameter 40"; two 16" gypsies. DRUM BRAKE: Contracting band type — asbestos lining — foot operated. WINCH DIMENSIONS: 12' long—8' wide — 5' 10" high. Reconditioned by U.S. Navy. Equal to new.

DIESEL DRIVEN FIRE PUMP



3510 GPM @ 350' HEAD or 161.7 PSI
Pump: 10" x 8" horiz. split case. Also 2000 GPM @ 110 PSI and 1450 RPM. Unused—all steel—will sell separately. Diesel: GM 6V-71 or 6-71 in-line, radiator or heat exchanger cooled.

NEW PHONE

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752-1077

located at
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ON METALS CO.

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Warehouse (301) 752-1077

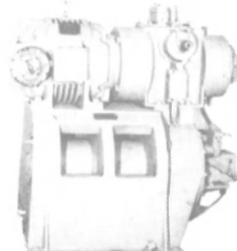
, MD. U.S.A.

TWX 710-234-1637

DAVIT — WINCH

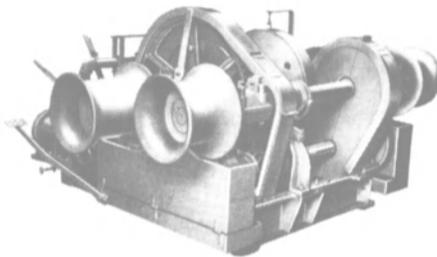
Mfg. by Skagit
Rated 4000 lbs. @ 80 FPM

6500 LBS OF
BOAT & MAN
AT 40 F.P.M.



Motor: 13.5 HP — 440/3/60. Designed for 1/2" 6x37 wire rope. Divided drum with 2 spooling areas. Drum 8 1/2" wide — 4" flange — 10" diameter. Complete with level wind. Also capable of manual operation by crank in case of motor failure. Hand brake & speed limiting brake are provided for holding & lowering boat by gravity. Non-magnetic.

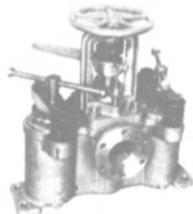
**7x12 10,000 LB AH&D
CARGO WINCH**



2-Speed — single drum — reverse throttle operation. LINE PULL: low gear 10,000 lbs — high gear 5,000. LINE SPEED: low gear 125 FPM based on 1st layer of 7/8" diam. rope — high gear 250 FPM based on 1st layer of 5/8" diam. rope. DRUM: 26" diam. — 20" long — 26" flange diam. Rope capacity of drum: 7/8" diam. rope in 6 layers — 650'; 5/8" diam. rope in 8 layers 1200'. Steam pressure at throttle 115 lbs. Operating weight 6450 lbs.

DUPLEX STRAINERS

4" and 6"



FOR
SALTWATER
OR
LUBE OIL

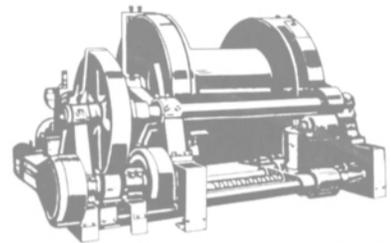
**PORTABLE - EMERGENCY
3" DIESEL GENERAL
SERVICE AND FIRE PUMP**

70 GPM @ 105 PSI
WITH HAND PRIMING



ENGINE: Mfg. by V.M.—air-cooled model HR192A—13.5 HP—3000 RPM—rope start (crank optional). PUMP: Hale—cast iron—3"—N.P.T.—hand priming—weight 410 lbs. Carrier mounted with 2 pneumatic tires for easy handling or 2-man hand carry. Ideal for oil barge, tankers, dockside, etc use.

**LARGE STEAM
TOWING ENGINE**
9 X 10 TWIN ENGINE DRIVE
Air or Steam — 125/250 PSI



Heavy-duty Clyde with 36" diameter X 51" Face single drum. Flanges 68". CAPACITY: Up to 2800' of 2" wire rope. Normal line pull 40,000 lbs@ 50 FPM. Steam or air pressure required 125 to 250 PSI. Can be adapted to electric drive or increased steam or air pressure to a capacity of 82,000 lbs @ 20 FPM. Pawl holds 270,000 lb. pull from any layer. Equipped with level wind device. Approximate weight 30,000. DIMENSIONS: 12'6" wide—6'6" high. Write for details.

ALSO AVAILABLE
Large towing ring — 36" I.D.

**T-2
EQUIPMENT**

Selected Items Listed

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

10 Stage — 435# — 720° T.T.

Turbine complete with rotor — serial No. 109166 — 4925/5400 KW — 3600/3720 RPM — 10-stage — 435# — 720° TT — 28.5" VAC.

**WESTINGHOUSE
538KW TURBINE ROTORS**

**WESTINGHOUSE 538 KW AUX.
GENERATOR EXCITER ARMATURE
400 KW REVOLVING FIELDS**

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

**FOR G.E. 525 KW
T-2 TURBO GENS.**

- G.E. DORV-325M TURBINE ROTORS

**AMPLIDYNE
GENERATORS — ABS**

NEW STYLE—LY148
ABS-READY-TO-GO

IN STOCK

FOR
IMMEDIATE
DELIVERY

MAIN CIRCULATING PUMP

complete — Ingersoll-Rand 24CVM.
New certif. 1979 — completely rebuilt.

**New Weather Satellite
Unit Introduced By GPI
—Literature Available**

A new, moderate-cost system for obtaining continuous-output, up-to-the-minute weather information from weather satellites covering most of the Western Hemisphere and other parts of the world, "Earth Station W,"

was introduced to commercial marine interests at the recent 1980 Fish Expo in Boston.

Global Positioning Instrument Corporation (GPI) of Fort Lauderdale, Fla., exhibited and gave live demonstrations of its lightweight, compact GPI-1010 weather satellite earth station at this annual exposition. Commercial fishermen, owners, operators and officers of high seas cargo ves-

sels and tankers, offshore oil rig operators and other maritime interests witnessed the demonstrations and learned about the new system.

Donald S. Trumbull, GPI president, believes this to be the first cost-effective equipment of its kind suitable for shipboard installation. "Now, for the first time, vessels can have their own onboard weather satellite imagery

updated hour-by-hour throughout most of the Western Hemisphere and in many other high seas and coastal areas of the world," he said.

"The GPI-1010 will produce satellite photos and meteorological charts whether at sea in some of the remotest areas or in port offices," Mr. Trumbull explained, "and there is no charge for this satellite service other than the purchase of the equipment."

The GPI-1010 operates directly from 12 volts dc, or 115/220 ac with optional converter, and weighs only 42 pounds. The system includes a 24-inch-diameter parabolic dish antenna that can be mounted at deck level or on the pilot house, a 1691 mH receiver, and a fully automatic continuous facsimile recorder. The recorder produces ready-to-view 7.5-inch-square, dry-printed images directly from the satellite on aluminized paper.

For further information and free literature on the GPI-1010, write to Donald S. Trumbull, Dept. MR, Global Positioning Instrument Corporation, 1525 SE 16th Street, Fort Lauderdale, Fla. 33316.

**J.B. Travis & Company
Named Gulf Sales Rep
For Adrick Cooling**



James B. Travis

James B. Travis & Company, Inc., Gautier, Miss., has been appointed Gulf Coast sales representative for Adrick Cooling Corporation, according to Richard C. Vassallo, Adrick president.

Adrick Cooling is a leading supplier of marine air-conditioning machinery, self-contained units, refrigerators, freezers and coolers, including design, engineering and fabrication of custom-built units and systems.

The Travis firm is headed by James B. Travis, a graduate of the U.S. Merchant Marine Academy, with 39 years of experience in the maritime industry, including a term as associate professor of engineering at Kings Point. For the past six years the company has served as manufacturer's representative for firms supplying products and services to the marine field.

Tie up to dependability.

If you're looking for dependable, reliable fuel service in Houston, Galveston, or Texas City, look no further. The hunt is over.

You've just found Houston Marine Services. HMS will get your diesel fuels and marine lubricants to you on time. And you'll get full measure for your money.

HMS will service your vessel by truck or barge. And we'll soon have a new fuel dock in the Houston harbor. It's part of our \$2,000,000 expansion, a construction project which underscores our commitment to service and dependability.

*Call (713) 455-8819
Or Cable HMS Jerico
910-881-7166*

Houston Marine Services, Inc.

First State Tower • Suite 509
12605 I-10 East • Houston, Texas 77015



Stop smoking. ITT Mackay now offers four ways to improve fuel efficiency.

ITT Mackay, known on the bridge for reliable marine communications systems, now enters the engine room. Featuring equipment manufactured by proven performers like the Wager Company and VAF Instruments, ITT Mackay now offers four products to meet your fuel conservation needs.

Smoke Indicator: Available in both visual and photoelectric models, the Wager smoke indicator can distinguish between white and black smoke. It indicates, at a glance, the direction of changes to boiler controls.

Combustion Optimizer: This unit fine tunes the air/fuel ratio of your automatic combustion control system. It receives input from an electronic smoke indicator or oxygen analyzer monitoring combustion gases. The result is a reduction in fluctuations around the desired control point, permitting a much lower level of excess air while maintaining smoke-free operation.

Viscotherm® Viscosity Control: The Viscotherm unit has been proven effective and reliable in both diesel and steam propulsion plants for 20 years.

Fuel Metering: ITT Mackay offers both piston and vane type pos-

itive displacement meters which can measure flows from 0.05 gal/hr (piston) to 425 gal/min (vane).

If you're thinking about fuel conservation systems, either retrofit or new construction, think ITT Mackay. To find out more about ITT's engine room products, call or write: ITT Mackay, Dept. 370, 2912 Wake Forest Road, Raleigh, NC 27611. Or telephone (919) 829-3134.

ITT

Mackay



Second of two 297-foot barges built by Nashville Bridge Company (NABRICO) begins its journey to National Marine Service, Inc., St. Louis. The two double-skin, rake tank barges were specifically designed for asphalt service.

NABRICO Delivers Two Asphalt Barges To National Marine Service

Two 297-foot double-skin rake tank barges specifically designed for asphalt service by Nashville Bridge Company (NABRICO) have been delivered to National Marine Service, Inc. of St. Louis. Each barge has a total capacity

of approximately 29,000 barrels or 1,218,000 gallons.

For asphalt service, a barge must be heated at a constant temperature in order to keep the asphalt fluid. This heat is supplied by a volcanic heater and is trans-

mitted by way of heating oil through a hot oil piping system.

The asphalt is unloaded by way of a Sier Bath pump at a rate of 2,800 gallons per minute. The total off-loading time is approximately 7½ hours for each barge.

The barges are certified by the United States Coast Guard for the carriage of Grade "A" or lower products. They are provided with American Bureau of Shipping classification A-1 Tank Barge, River Service and loadline for unmanned voyages between Chicago and Michigan City, Ind., and between Carrabelle, Fla., and St. Marks, Fla.

Updated Marine Survey Practice Compendium Now Available

Richard A. Cady has prepared a new comprehensive reference and guide for marine surveyors, owner's representatives, ship repairers, underwriters, admiralty attorneys and others concerned with marine damage and condition surveys of seagoing vessels, barges, tugs, yachts, dredges, offshore structures and marine fixed shoreline installations.

The new compendium is a consolidation, revision and updating of previous work by Mr. Cady. It reflects a concerted effort to depict current costs of the industry. Seventy-seven survey examples of preliminary field surveys, final damage survey reports, and condition survey reports are offered, which delineate various

NABRICO is a wholly owned subsidiary of The American Ship Building Company, Tampa, Fla. 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 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.

survey formats encountered in the USA and abroad.

Particulars offered include marine insurance terms, various causes of damage, survey procedures for both damage and condition surveys, arrangements for salvage, and unusual circumstances pertaining to oil pollution, tenders for repairs, wreck removal, repair cost evaluation, etc. Details provided relating to ship repair cost evaluation include facets of competitive bids, time and material cost, negotiated cost, overtime charges, drydocking tariffs and useful tables indicating man-hours and unit cost for steelwork renewals.

The compendium has been contrived and arranged with a view to depicting actual expressions and terminology of the marine industry and providing ready reference to facilitate expedient review of procedures and circumstances possibly applicable to a particular type survey.

For further information on the 1981 Marine Survey Practice Compendium, write Dept. MR, Marine Survey Press, P.O. Box 9307, Mobile, Ala. 36691, \$54 per copy postpaid.

Baragona Named Sales Director-U.S. Gulf Division For Delta Lines

Frank J. Baragona has been appointed director of sales-U.S. Gulf Division of Delta Steamship Lines, Inc. The announcement was made by Capt. D.P. Kirby, senior vice president of the Gulf Division.

Mr. Baragona will be responsible for the development and implementation of all Delta's U.S. Gulf sales programs for the company's services to the east coast of South America and to the west coast of Africa.

Formerly assistant to the vice president-Traffic (Gulf), Mr. Baragona joined Delta in February 1975, and subsequently held sales positions at several of the company's domestic offices.

FOR DIESEL ENGINES . . .

CHECK CYLINDER LOAD DISTRIBUTION WITH --

BMEP BALANCER MODEL 300-A



ATTACHES TO STANDARD INDICATOR VALVE
INDICATES CHANGE IN CYLINDER LOAD WHILE ADJUSTING FUEL RACK
GAUGE READING COMPARABLE TO AREA OF INDICATOR CARD
SIMPLE TO USE
REQUIRES NO MAINTENANCE
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Please send free catalog on balancer

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ONLY PLACE FOR BIG LATHES At Reasonable Prices & Good Deliveries



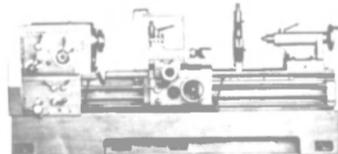
- HOLLOW SPINDLE LATHES
- OIL COUNTRY LATHES

Swing over bed — 25" - 34" - 39"

*Distance between centers from 80" up to 320"

Hole thru spindle — 6" - 9" - 12" - 14" - 16" - 20"

HEAVY DUTY LATHES



Swing over bed — 48" - 56" - 62"

*Distance between centers from 80" up to 472"

ROLL TURNING LATHES



Swing over bed — 70" - 78" - 85"

*Distance between centers from 80" up to 472"

(*Distance between centers is in one piece bed.)

Don't Hesitate. CALL NOW toll free (1-800) 421-2105

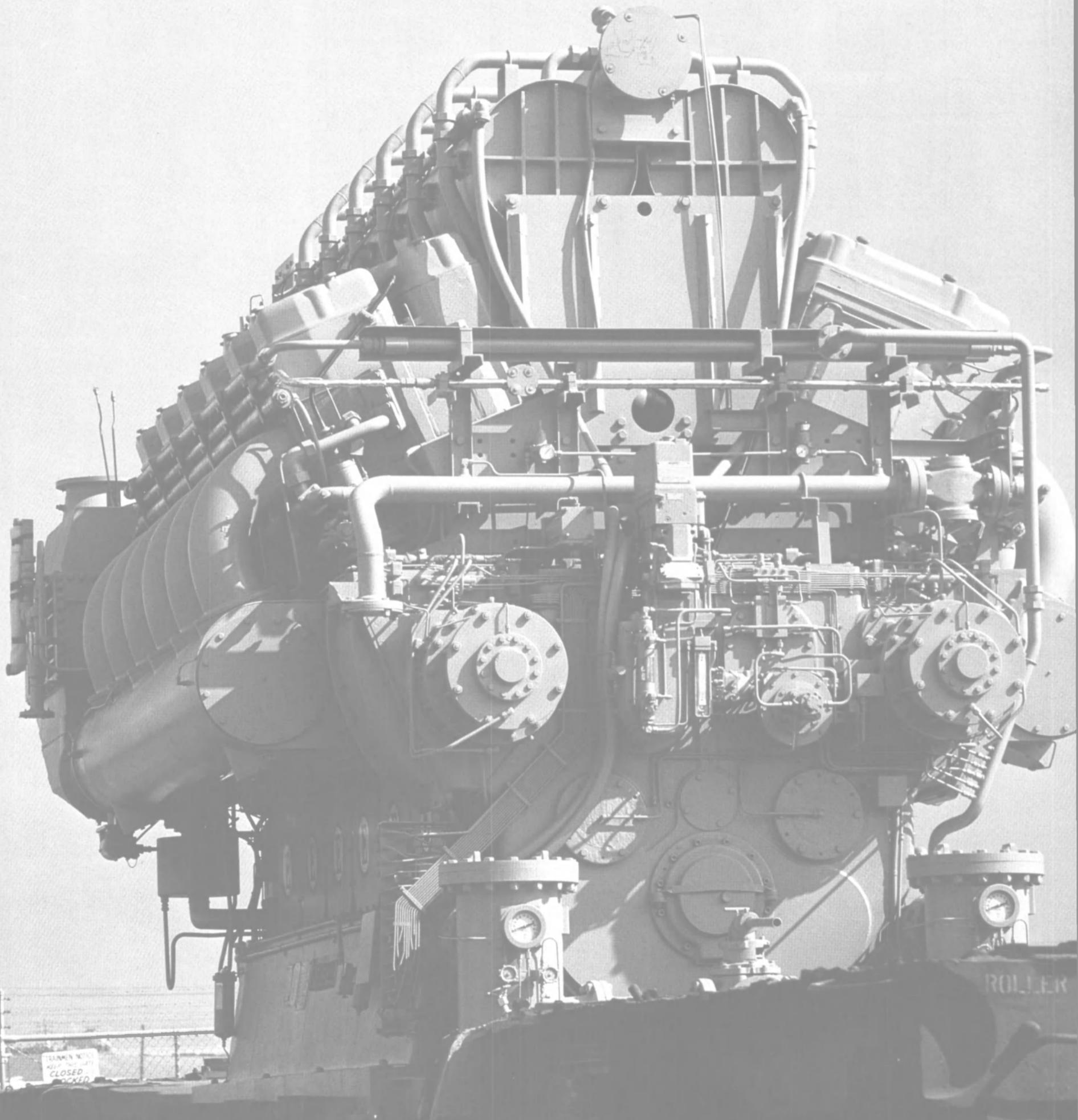
REPUBLIC-LAGUN MACHINE TOOL CO.

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The finest heavy duty, multi-fuel main and auxiliary diesel engines are created right here in America. At our plant in Oakland, California.

We've been trusted engine technologists for decades. And with today's fuel economy trend to diesels, our long experience at sea is paying off for an increasing number of advanced vessels: tug-barges, 1000-foot ore boats, container ships, tankers, workboats, passenger vessels...

These heavy-duty, four-stroke Delavals have the right power (3,000 to 13,500 hp). They also have the compactness, the reliability and the designed-in thermal efficiency to deliver the full economy of heavy fuel operation.

Your investment in American technology and in American field support is secure, because in the world of diesel power, this one is a proven winner.

Transamerica Delaval Inc., Engine and Compressor Division, 500 85th Ave., Oakland, Calif., 94621. Phone (415) 577-7400. Telex (47) 33-5304. Cable Enterfound.

 **Transamerica
Delaval**

**\$2.9-Million Outfall
Contract Awarded To
SeaTec International**

SeaTec International Ltd. has signed a lump-sum underwater construction contract for \$2,983,500 with the Puerto Rico Aquaduct and Sewer Authority.

They will construct the outfall

on the rugged north coast of Puerto Rico some 60 miles west of San Juan.

SeaTec will lay the 24-inch-diameter ductile iron pipeline 2,000 feet out to sea to a Tee-connection secured by a 30-ton precast concrete thrust block in 60 feet of water. Here, SeaTec will install a 250-foot difuser system parallel to the beach, sup-

ported on precast concrete piers set on the ocean bottom.

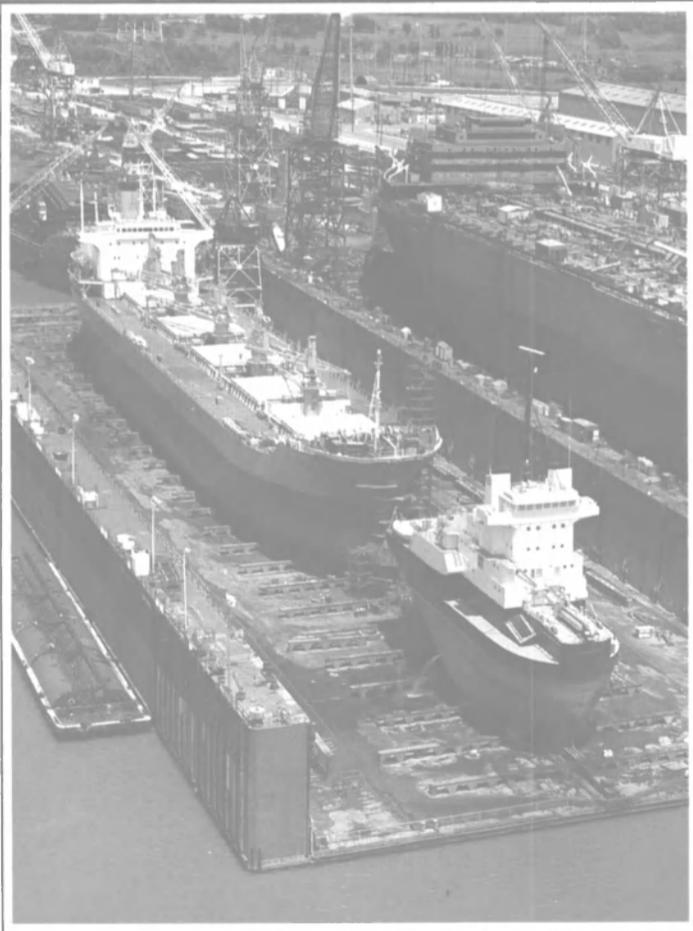
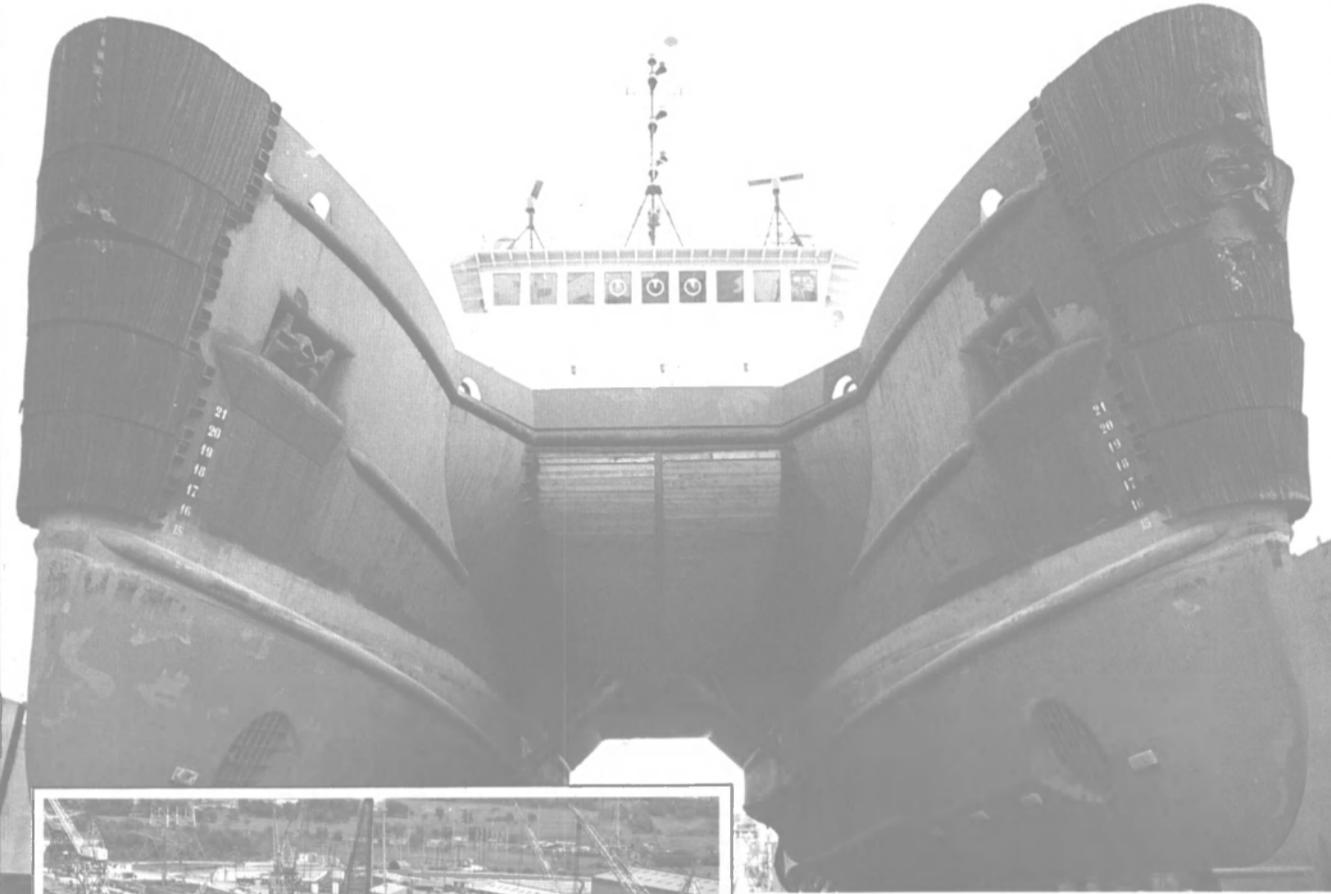
The surf-zone section of the line will be laid from a trestle and the balance of the line from SeaTec's new oceangoing barge, the SeaTec Sentinel.

Pan-Carbide Marine, a Puerto Rican marine engineering firm, and D'Angelo Schoenewaldt and Associates, Inc. of New York,

specializing in offshore construction will supply consulting services.

SeaTec International Ltd. performs high-risk marine and underwater construction work and maintains offices in Houston, Texas, Great Yarmouth, U.K., New York, N.Y., Gloucester, Mass., Santurce, Puerto Rico, St. John's, Newfoundland, Cairo, Egypt, Singapore, and Mexico City.

For the Broad of Beam



Avondale's drydock at the Main yard can accommodate any vessel that can navigate the Mississippi River. Our yard flexibility and efficiency allow for service of all ocean going vessels including drill rigs up to 215' wide, and of course...all types of inland vessels.

When your needs are yard needs; come to Avondale. The experience counts and you'll get quick turnaround. Quick, efficient and dependable. We feel good about being best.

**Avondale Shipyards, Inc.
Marine Repair Division**



P.O. Box 50280
New Orleans, Louisiana 70150
(504) 436-5274
A subsidiary of Ogdan Corporation.

**S.P. Marchant Named
Assistant General Sales
Manager For Paceco**



Stephen P. Marchant

Stephen P. Marchant was recently appointed assistant general sales manager for Paceco, Inc. of Alameda, Calif., a subsidiary of Fruehauf Corporation. The announcement was made by Meryl Stratton, general sales manager of one of the world's largest manufacturers of container-handling cranes.

Mr. Marchant will develop a recruitment and training program for inside sales engineers at Paceco's new world headquarters at Gulfport, Miss. Prior to coming to Paceco, he was self-employed in sales, and had extensive experience with several divisions of the Koehring Company in various positions, including sales training manager and district sales manager.

**Collingwood Shipyards
Awards Contract To
SPAR Associates**

SPAR Associates, Inc. of Annapolis, Md., has been awarded a contract to provide production scheduling services for Collingwood Shipyards, Ltd., Collingwood, Ontario, Canada. The project includes developing detail manpower requirements for the construction of two 730-foot bulk carriers and three 730-foot self-unloader ships.

Collingwood, one of five shipyards in the United States and Canada using SPAR's planning and cost/schedule control systems, will be using the WORK-PAC and PERT-PAC systems on a continuous basis throughout the construction of these vessels.

Ship owners trust Texaco lubricants and services to help keep their vessels running efficiently.



They trust Texaco research to produce products that meet the severe operational demands of today. Products such as:

- DORO AR 30—alkaline reserve crankcase lubricant.
- TARO Special—our specially formulated cylinder lubricant.
- TARO XD and TARO DP—the multipurpose products for lubrication of medium speed diesel engines.
- REGAL R&O SERIES—turbine lubricants which meet

the demanding requirements of today's equipment.

They trust Texaco's rapid oil analysis program which provides an analysis-and-detection service that can spot potential problems early and help reduce costly unscheduled downtime.

It all adds up to one thing. Marine engineering experience. Ship owners and engineers know Texaco has that experience and know we are working harder to keep their trust.



For information on our full line of marine lubricants, direct your inquiry to:

Texaco Inc.

International Marine Sales Dept.
2000 Westchester Ave., White Plains, New York 10650

Texaco Ltd.

International Marine Sales
1 Knightsbridge Green, London SW1X 7QJ

MTU: know us by the company we keep

Time after time, in application after application, the leaders in the offshore industry specify MTU marine diesel engines for their crew/supply boats. The many exceptional reasons include its low fuel consumption, high power output, operational safety and durability, low weight and compactness, and a reliable service organization.

Our 4-cycle engine, by its very nature, consumes less fuel than any comparable engine. This fact is even more impressive when you consider the ever increasing fuel costs.

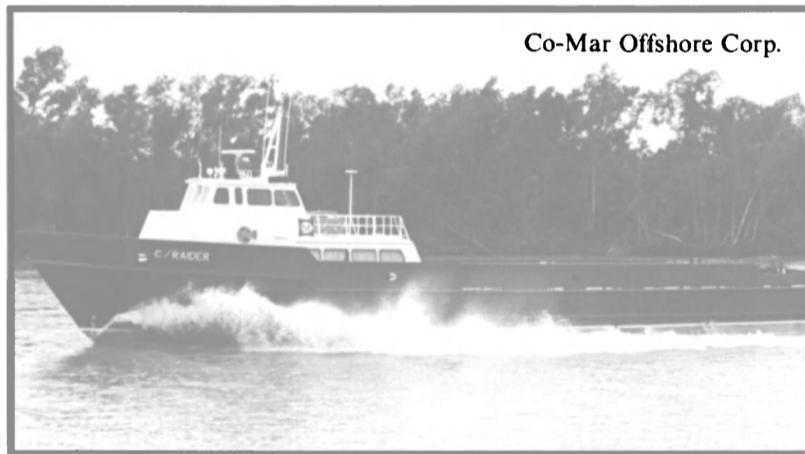
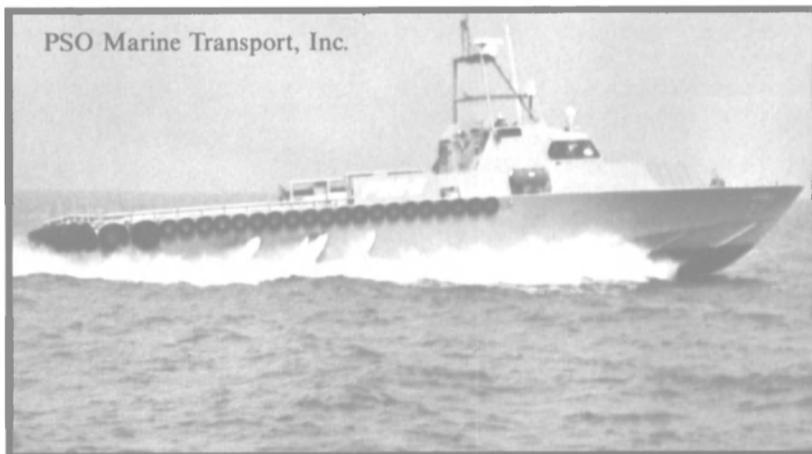
MTU high performance diesels can be used on continuous duty. This comes as no surprise since MTU diesels lead the world market in operational safety and durability in the field of high speed transportation. You can't get anywhere faster or safer than with MTU.

Ease of installation is due primarily to the design, low weight and compactness of the engines. In addition, MTU offers complete service/parts back-up and a proven service/parts exchange program for any area of the world. The reliability of an MTU engine is unsurpassed

due to the rugged quality control tests and checks performed on each one. Our demands on every engine are far greater than those of our customers.

Decades of testing and technology are responsible for the quality of our engines and the success they have had as industry leaders.

No other engine manufacturer can make the claims we do and back them up. And with fuel and other operating costs rising almost daily, MTU marine diesel engines make more sense than ever. You can tell by the company we keep.



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Zidell Repairing Three Coast Guard Vessels At Total Cost Of \$1 Million

Three U.S. Coast Guard ships were moored at docks of Zidell Explorations, Inc., Portland, Ore., recently for regular maintenance and repair. One, the buoy tender Iris will also have its entire electrical system replaced, necessitated by a fire at sea that caused extensive damage to the engine room. All told, the three repair jobs are valued at over \$1 million to the company's Marine Repair Division.



Buoy tender Plane Tree is one of three Coast Guard ships being worked on by Zidell in contracts totaling over \$1 million.

Plane Tree and Iris are sister ships, buoy tenders of the 180-foot class, 1,025 tons each, with single screws. Iris, while working with a buoy, took a wave from the stern which swamped the engine room, short-circuited the electrical system, and caused an oil-fed fire. The ship had to be towed to port.

Confidence, a 210-foot cutter, went into drydock two days after Plane Tree floated free to be tied up at Zidell's docks for further fitting.

Much of the work to be done on Plane Tree and Iris consists of general repair and replacement of sea-worn parts and fittings. Both ships will have cargo hoisting gear, anchors, and anchor chains overhauled, along with renewal of watertight doors and hatches and repair or replacement of various parts of the fuel systems. Plane Tree will also have its rudder and pintle bushings replaced, and warping winch overhauled, the Fathometer transducer replaced, and other electronic repairs and servicing carried out. Total cost is estimated around \$350,000.

Iris, in addition to regular maintenance and replacement of worn parts, will require overhaul of ventilation fan motors, both main generators and service generators. All asbestos insulation in the engine room will be replaced, as will the fire-damaged deck covering and switchboards. Iris is expected to be undergoing repairs for many months, as the switchboards must first be designed, then Coast Guard-approved and fabricated. Cost of general repairs will be about \$262,000, with design of the switchboard and replacing of the entire electrical system estimated, at this time, to exceed another \$250,000.

Confidence will have regular maintenance work done on the hull, anchor chains and boat davits overhauled, sprinkler system

modified, new galley ranges installed, repairs made to the controllable-pitch propeller mechanism, propeller blades inspected and tested, and considerable modification of the electronic systems carried out. Cost will be around \$250,000.

Marine Equipment & Consultants To Represent Vent Check Valves And Level Gauges For Winel

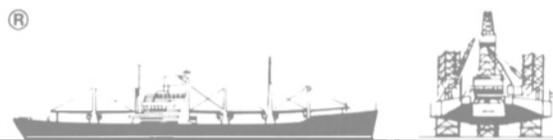
Winel of America, Inc., Grafton, Ohio, recently appointed Marine Equipment & Consultants, Inc., P.O. Box 3578, New Orleans, La. 70177 as sales representatives for the Winel Tank Vent Check Valves and the Seetru Level Gauges in the states of Louisiana, Mississippi, and Alabama.

Richards Associates Named Hydro's Gulf Coast Representative

Hydro Products, Inc. of San Diego has announced the appointment of C.A. Richards and Associates of Houston to Hydro's worldwide sales network. Charles A. Richards and his associates will be responsible for the sales activity in the Gulf Coast region, with service support through Hydro's Houston Service Center.

Hydro Products, a wholly owned subsidiary of Tetra Tech, Inc., is engaged in developing, manufacturing and marketing underwater television systems, illumination systems, instruments and remote controlled vehicles used primarily in the offshore oil, marine construction and utility industries.

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With equipment this important you want the best reliability and performance available. Magnavox has produced over 3,000 Satellite Navigators (1100 Series) with over 30 million hours of actual operation. An impressive record!

For support that matches Magnavox's reliability, Nav-Com is ready to respond to your needs with prompt, efficient, and competent service.

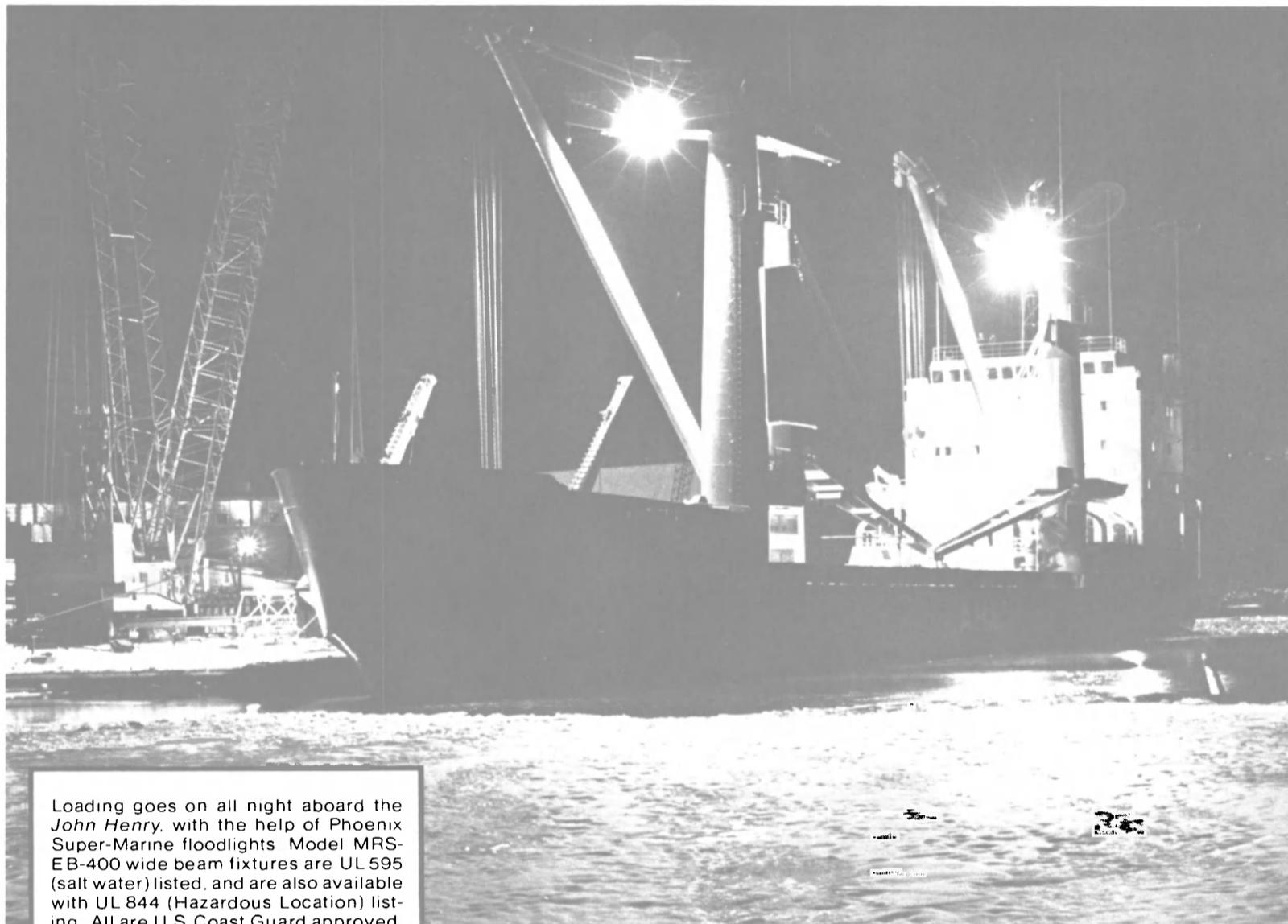
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Loading goes on all night aboard the *John Henry*, with the help of Phoenix Super-Marine floodlights. Model MRS-EB-400 wide beam fixtures are UL 595 (salt water) listed, and are also available with UL 844 (Hazardous Location) listing. All are U.S. Coast Guard approved.

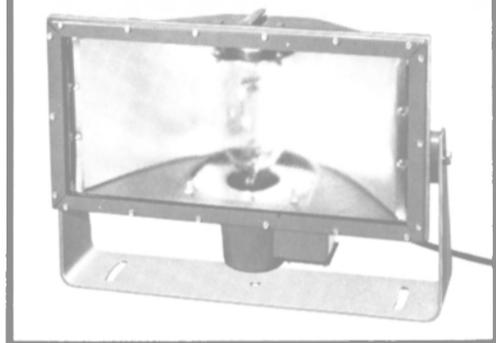


PHOTO COURTESY OF AMERICAN HEAVY LIFT SHIPPING CO.

Phoenix Super-Marine floodlights help light the way for new heavy-lift shipping venture

A new chapter is being written in American maritime history by two new ocean-going cargo ships, the *MS John Henry* and the *MS Paul Bunyan*. Built by Peterson Builders, Inc. of Sturgeon Bay, Wis. to U.S. Coast Guard standards for international trading, the ships are owned by the American Heavy Lift Shipping Co. (a joint venture of Gulf Trading & Transportation Co. and Hansa Line of Bremen, West Germany).

The 3,000-deadweight-ton vessels provide American manufacturers with the first U.S.-flag heavy lift ships. They are being used to supply the growing world market for large industrial equipment such as generators, nuclear reactors, refineries, chemical plants, oil rigs, locomotives, mining equipment, etc.

Loading huge units weighing up to 1,000 tons is a critical operation, with progress measured in inches. Work often goes on around the clock... which makes dependable lighting absolutely essential.

That's why the builders chose Phoenix Super-Marine floodlights. Each ship has eight Phoenix Model MRS-EB-400 fixtures mounted on the king post cranes to flood the entire deck with ample light. Equipped with

energy-saving clear mercury vapor lamps, these 400 watt wide-beam fixtures feature shock and vibration resistant lamp mountings, with one-piece cast marine aluminum housings and gasketed watertight enclosures.

To learn how Phoenix floodlights can help you increase safety and efficiency, and reduce your lighting maintenance costs, call your Phoenix distributor or write for details.



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AquaMarine Asks Title XI On Deck Specialty Barge To Cost \$4.15 Million

AquaMarine Associates, doing business as Offshore Transportation Co., 935 Mellie Esperson Building, Houston, Texas, has applied to the Maritime Administration for a Title XI guarantee to aid in financing the construction of one deck specialty barge. The company plans to operate the 300-foot-long vessel in the U.S. Gulf Coast area. The proposed builder, Misener Industries, Inc. of Tampa, Fla., has set delivery for December 15, 1980.

If approved, the Title XI guarantee will cover \$3.6 million, or 87½ percent of the barge's \$4.15-million estimated cost.

Guy Beakley Appointed Director Of R&D For Scientific-Atlanta

Scientific-Atlanta, Inc. of Atlanta, Ga., has announced the appointment of Guy W. Beakley as its director of research and development. He comes to his new position from two years as general manager of the company's satellite communications division. As director of research and development, he will be responsible for developing and overseeing the corporate R&D plans and objectives, reporting to the office of the president.

Dr. Beakley joined Scientific-Atlanta in 1977 after several years in engineering and management positions at RCA Laboratories in Princeton, N.J.

Norris Butterfly Valve Features Positive Shutoff —Literature Available

Designed specifically to handle hydrocarbons, corrosive media, and other difficult applications, the Norris M285 Series butterfly valve is a long-life, positive-shutoff valve that meets ANSI B16.5 Code for pressure and temperature ratings of Class 150 flanges.

An O-ring, set in a specially designed disc groove (patent applied for), seals against the field-replaceable metal liner. The bi-directional disc O-ring groove assures positive shutoff in both directions. Shaft O-ring seals and metal liner keep the body dry. Separate body O-ring flange seals eliminate the need for flange gaskets, and can be replaced in minutes without dismantling the valve.

An almost endless combination of disc, liner and O-ring seal materials is possible to control even the most destructive flowstream. Norris valves with stainless steel, Inconel, Hastelloy, titanium, Monel, zirconium, or aluminum bronze

disc and liner; Viton®, Kalrez®, buna N, EPDM, or neoprene seals solve difficult valving problems in the chemical processing industry — without repairs — over long periods of service time. The limited amount of elastomeric material that is in contact with the flowstream makes M285 valves ideal for handling volatile materials such as gasoline, jet fuel,

and solvents which tend to dry elastomers.

The flow area is equal on both sides of the through-shaft and angled disc. According to the manufacturer, there is less turbulence and reduced fluid dynamic torque than in "high-performance" butterfly valves with off-set discs.

Rated at 285 psi w.p. with re-

serve strength to handle sudden differential pressure surges, the Norris M285 butterfly valve is available in sizes 2½ through 36 inches, single flange lug and wafer styles, with a choice of manual or automated operators.

For free literature or additional information, write to Mrs. Pat Dillard, Dept. MR, Dover Corporation/Norris Division, P.O. Box 1739, Tulsa, Okla. 74101.



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The Sea-Shed System

The "Sea-Shed" is a king-sized, open-top, multipurpose container which forms the "heart" of an innovative marine transportation system. Designed primarily for the stowage of the large number of commodities which comprise the neo-bulk cargo market, the Sea-Shed has been configured to assure compatibility with the standard barge systems adopted by both the U.S. and European waterways. This container also has been sized to permit efficient handling and stowage in the large open holds of most bulk and neo-bulk ocean carriers in service.

The dimensions of the Sea-Shed are based on multiples of the standard I.S.O. container. Sea-Sheds also can be accommodated in the cellular compartments of containerhips and combination container/breakbulk vessels. The key to the system concept lies in the unique patented design features of the container.

The basic marine applications include its use as a portable ship's hold, shoreside transit shed, domestic container for standard sized U.S. inland waterway hopper barges, and as a cargo box which can serve to convert harbor lighters into covered barges.

As a system, Sea-Shed offers the potential for barge or ship operators to expand their market opportunities, increase capacity utilization and total earning power. Insofar as marine intermodal applications are concerned, the system adds a new dimension to combined sea/waterway services. Since it can be readily adapted to the many thousands of standard barges presently operating on the large river networks in the U.S. and Europe, the system can be introduced without disturbing arrangements which have been the culmination of many years of development. It enables operators of existing tonnage to make a slow and cautious transition from today's cargo handling and shipping practices to the more elaborate systems of tomorrow.

The Sea-Shed

What is the Sea-Shed? The Sea-Shed is essentially a supersized version of the standard I.S.O. open-top container.

Built around a framework of four corner posts, it is tied together longitudinally by top rails and lower rails which also tie the

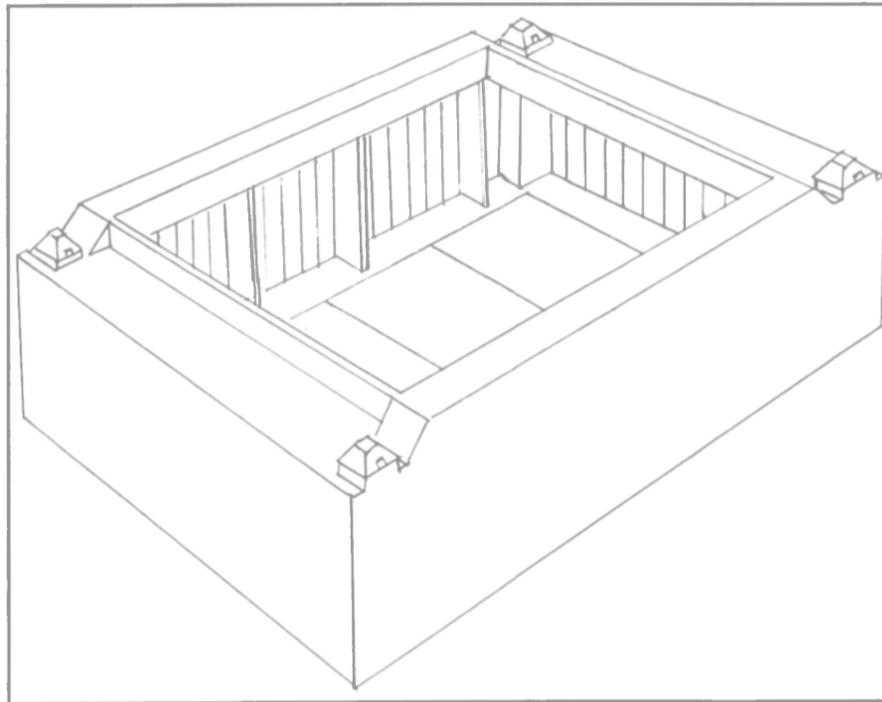


Figure 1 — The Sea-Shed is essentially a super-sized open-top container.

end frames together to form the box, Figure 1. The corner posts are fitted with complimentary upper and lower castings to facilitate rapid transfer via floating or shoreside heavy-lift cranes and to enable stacking on river barges, in the holds of oceangoing vessels or at shoreside facilities. However, the Sea-Shed incorporates certain unique design features which clearly distinguishes it from any other type container of either standard or nonstandard design.

The key feature of this "super" container lies in the design of its bottom structure. A rectangular hatch frame which occupies most of the inside floor area is secured to the base cross members and bottom side rails. Hatch covers comprising fore-and-aft bifolding panels are fitted into this frame. The container thus normally has a continuous floor, but when the covers are folded up, it has a large hatch opening, providing access to the cargo stowed in another container placed beneath it. The fold-up floor feature provides for considerable flexibility in cargo operations.

The container is fitted with a roof hatch frame for placement of watertight pontoons. These covers would be used only on a container exposed to the weather, such as the top container of a stack of containers, or individual containers temporarily stored shoreside.

Roof covers would not be required for a shipboard cargo operation.

Shipboard Use

The system provides shipowners with more alternatives during periods of depressed shipping rates. A "portable" 'tweendeck arrangement enables the operator to quickly shift from one cargo to another or from one trading area to another as market demand dictates. This type of flexibility can take on special significance for ocean carriers engaged in short-term-charter agreements where demands for 'tweendeck general cargo space or open-hold single deckers for neo-bulk such as lumber, newsprint, etc. along with certain bulk cargoes tends to fluctuate.

Once emptied of cargo, the Sea-Sheds can be shifted from hold to deck or vice versa to suit the special stowage requirements for either the base-haul or back-haul voyage.

The Sea-Sheds can be positioned and restrained in the ship's hold by a heavy-duty guide structure similar to the type presently in use. Double-bottom reinforcement would, of course, be required to compensate for the highly concentrated corner-post loadings.

Sea-Shed installation would not require the use of shipyard cranes. This can be accomplished at the ship's normal loading berth via conventional-type floating der-

ricks or mobile truck cranes. The tare weight of the Sea-Shed would, of course, vary according to size and construction materials. However, the largest size steel module envisioned (40-feet long by 25-feet wide and 12-feet deep) would have a tare weight slightly in excess of 30 tons.

The flexibility of the Sea-Shed provides river operators with a means for introducing entirely new distribution concepts on inland waterways.

MarAd Studies Sea-Shed

The Maritime Administration awarded a contract to M. Rosenblatt & Son, Inc., naval architects, to study the Sea-Shed concept as it would apply to containerhips. This report stated, in part, as follows:

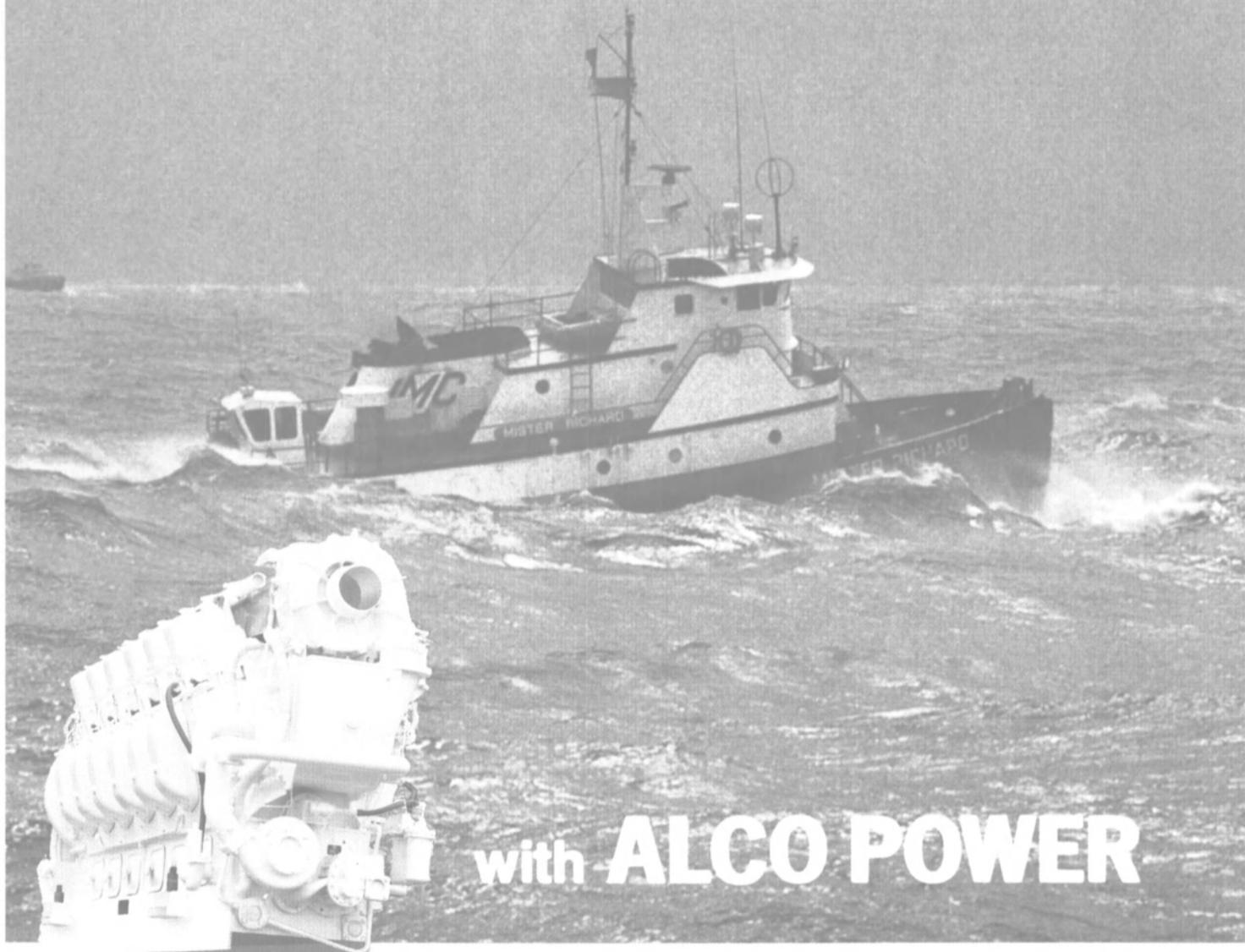
The Sea-Shed concept is that of a removable modular 'tweendeck conversion system for containerhips to provide them with the capability to carry outsize and heavy unit loads which cannot be containerized in standard I.S.O. containers. Sea-Shed modules are large open-top containers having work-through floors designed for insertion into container holds having at least three laterally adjacent 40-foot container cells. Depending on the depth of the hold, the modules may be installed in a stacked arrangement.

When Sea-Sheds are installed in the ship, their work-through floors are in effect 'tweendecks and may be likened to the folding 'tweendeck hatch covers on breakbulk cargo ships. The Sea-Shed modules will be inserted into the ships by dockside cranes. Cargo may then be loaded on a unit or breakbulk basis.

Adoption of the Sea-Shed concept will provide U.S.-flag containerhips with a versatility which will make possible the utilization of these ships for handling outsize commercial and military cargoes.

The Sea-Shed development is a response to the need to improve American merchant marine ship capacity utilization in commercial and military applications. The general decline in the number of breakbulk U.S.-flag merchant cargo ships and the increased trend toward the construction of "full" containerhips has deprived commercial shippers and the military of ships with the capacity to accept outsize cargo.

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First American Asks Title XI On Two Bulk/Containerships

First American Bulk Carrier Corporation, Orange, Texas, has applied to the Maritime Administration for a Title XI guarantee to aid in financing the construction of two bulk/container ves-

sels. First American, a new company owned by the Pension Fund of the Marine Engineers' Beneficial Association and General Shipholding, S.A., a firm organized in Luxemburg, had previously applied to MarAd for construction differential subsidy for these ships.

Each of the 38,580-dwt ships, to be powered by diesel engines,

would have two onboard, 30-ton gantry cranes and capacity to carry about 1,300 TEUs. They would be used in worldwide trading, primarily between the U.S., Europe, and Australia. Levingston Shipbuilding Company, also of Orange, is the proposed builder, with delivery estimated for September 1982 and August 1983.

The estimated cost of each ves-

sel is \$78 million, \$36.3 million or 46.5 percent of which will be paid by the construction differential subsidy. Therefore the Title XI guarantee, if approved, will cover \$31,275,000 or 75 percent of the \$41.7 million that will be the owner's cost for each ship.

Marine Efficiency Opens New Seattle Office To Serve Fishing Industry

Marine Efficiency Engineering recently announced the opening of its new office at 2208 N.W. Market Street, Suite 210 Ballard Building, Seattle, Wash. The firm provides independent marine engineering consulting, design, and problem-solving for the fishing industry, with emphasis on energy efficiency in propulsion and auxiliary machinery systems.

The two principals are **George A. Lundgren** and **Thomas J. Breiwick**. Their firm is stressing an active involvement in current fishing technology such as automated longlining and factory trawlers.

Mr. Lundgren has been an independent consultant for the past five years specializing in fuel economy, speed and power prediction, propulsion system design, and vibration analysis.

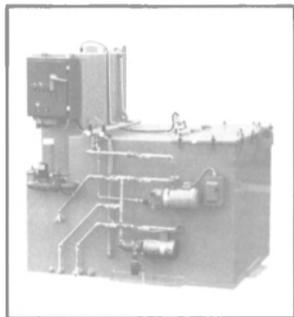
Mr. Breiwick has spent the past 11 years as a marine engineer at shipyard and naval architecture offices, most recently as a principal in the design offices of B. F. Jensen and Associates. He works primarily in the field of vessel auxiliary machinery systems, piping systems, and hydraulic system design.

Jerry Magness Named Marketing Manager For Petro-Marine Engineering

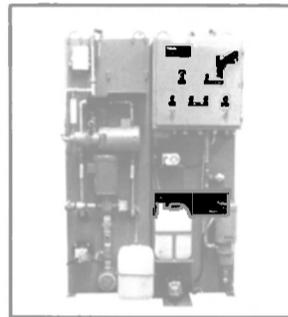


Jerry D. Magness

Petro-Marine Engineering, Inc. has announced the appointment of **Jerry D. Magness** as manager-marketing. He formerly served as manager-projects in the firm's New Orleans office. In his new capacity, **Mr. Magness** is responsible for the Petro-Marine's worldwide marketing operations, including client relations, market-



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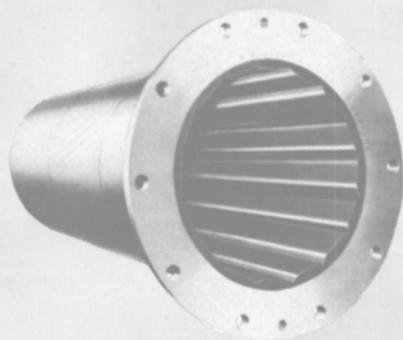


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Petro-Marine is one of the nation's largest independent engineering consulting firms serving the energy and marine industries. It specializes in feasibility studies, design, planning, coordination and construction management of offshore structural, process, and pipeline projects as well as onshore facilities and civil works. The firm has offices in New Orleans, Houston, London, England, and Lafayette, La.

MarAd Approves Title XI On Eight Tractor Tugs To Cost \$19.8 Million

The Maritime Administration has approved in principle an application from Faustug Marine Corporation of San Francisco for a Title XI guarantee to aid in financing the construction of eight tractor tugs. The 3,000-horsepower, twin-screw tugs are intended to be used for precision towing assignments in the search for offshore Alaskan and California oil. Each of the vessels will be 92 feet 6 inches long and have a molded beam of 32 feet.

The Port Brownsville Shipyard, Port Brownsville, Texas, has been selected to build the vessels, which are scheduled to be delivered between December 1980 and January 1982. The Title XI guarantee covers \$17,320,275, which is 87½ percent of the estimated cost of \$19,794,600.

Fernstrum Offers New Literature On Gridcooler® Keel Cooling Systems

R.W. Fernstrum & Co. of Menominee, Mich., is offering new literature on the Gridcooler® packaged keel cooling system.

The Gridcooler is available in many sizes to meet varied engine applications and operating conditions. In many cases, the Gridcooler takes only one-twelfth of the room needed for traditional channel cooling. A vessel with recessed packaged keel cooling also experiences far less drag than one with channel cooling systems and can be operated in ice-laden waters or mud flats without difficulty.

For full free details on Fernstrum's Gridcooler keel cooling systems, write **Paul W. Fernstrum**, Dept. MR, R.W. Fernstrum & Co., P.O. Box 87, Menominee, Mich. 49858.

J.C. Kiersted Appointed Public Relations Manager For Texaco U.S.A.

J. Christopher Kiersted has been appointed manager of public relations for Texaco U.S.A., it was announced recently by **Annon M. Card**, president of Texaco U.S.A. In his new position, Mr. Kiersted will coordinate pub-

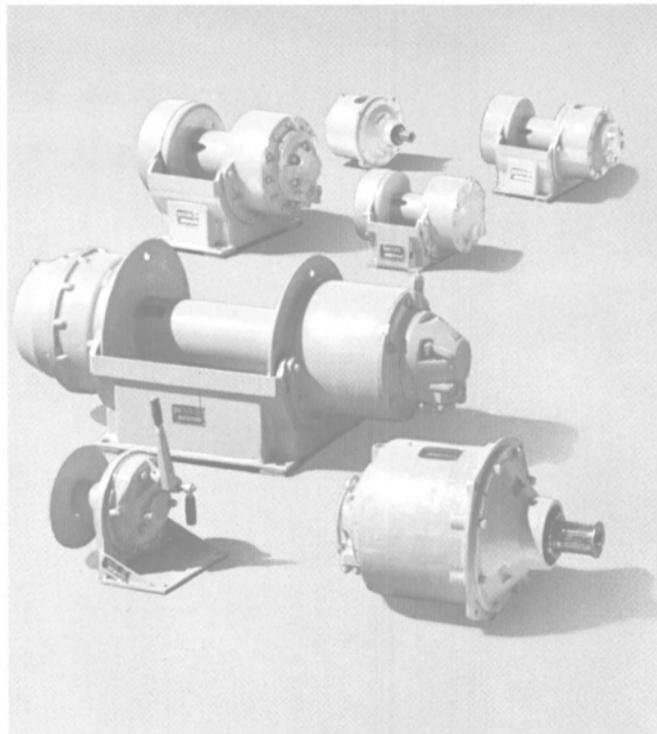
lic relations activities for Texaco U.S.A. He will continue to be located in Houston.

Mr. Kiersted joined Texaco in 1951 as an employee relations trainee. He subsequently served at Texaco refineries at Port Arthur, Amarillo, and elsewhere, becoming plant supervisor for employee relations.

In 1958, Mr. Kiersted was transferred to the personnel divi-

sion of the public relations and personnel department, located in New York City, and was named supervisor of college relations there in 1959. In 1965, he was appointed manager of the Pacific Coast area of the public relations and personnel department, located in Los Angeles. In 1975, he was named assistant to the vice president of Texaco Inc., in charge of the company's Houston offices.

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ensure that our equipment is exactly right for your job, even if it means customizing it—with proven Gearmatic components. Line pulls to 44,000 pounds. Gear, vane or piston motors to 5,000 psi. Depend on the problem solvers. The Gearmatic distributor team is pulling for you.

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Armour Swanson Named President Of Waukesha Bearings Corporation



Armour F. Swanson

Armour F. Swanson has been named president of Waukesha Bearings Corporation, a subsidiary of Dover Corporation of New York. Waukesha Bearings has plant operations in Waukesha, Butler, and Antigo, Wis., as well as in Tokyo, Japan, and Drunen, Holland.

Mr. Swanson was most recently president of Graham Company, Menomonee Falls, Wis., for seven years. Prior to Graham, he was affiliated with the Enerpac Division of Applied Power Industries for eight years.

Trans-Agra Asks Title XI On 30 Hopper Barges To Cost \$8.3 Million Total

Trans-Agra, Inc., Memphis, Tenn., has applied to the Maritime Administration for a Title XI guarantee to aid in financing the construction of 30 covered hopper barges.

The vessels are intended to operate on the Ohio, Mississippi, and Illinois Rivers. They will measure 195 feet by 35 feet by 12 feet. Dravo Corporation of Pittsburgh is the proposed builder. Delivery of 10 barges is expected later this year; the remaining vessels are scheduled for delivery in 1981.

If approved, Title XI financing would cover \$7,240,348, or 87½ percent of the estimated cost of \$8,274,684.

Redish Named Manager Of Data Processing For Norton, Lilly

Stephen Redish Jr. has been appointed manager, Data Processing Department, for Norton, Lilly. Previous to his joining the company, he was associated with Marine Transport Lines.

Norton, Lilly & Company, Inc., founded in 1841, is one of the oldest shipping companies in the United States, headquartered in New York, with a network of 22 branch offices from coast to coast, including the Panama Canal.

Marland Acquires Allied Water

Marland Environmental Systems, Inc. recently announced the acquisition of Allied Water Corporation, a San Francisco-based manufacturer of integrated reverse osmosis (RO) purification and desalting systems.

Since 1975, Allied has been en-

gaged in research and development of the reverse osmosis process as a reliable energy-efficient alternative to existing troublesome evaporative techniques. The Sweet Water™ systems they manufacture use third generation technology to produce water of extreme purity from salt, brackish and other impure sources.

The product line includes 21

units with daily capacities from 40 to 7,500 gallons.

"The acquisition of Allied is part of an ongoing program to broaden and strengthen our product line," commented Marland vice president, Bob Daniels.

Marland, a public company with headquarters in Walworth, Wis., is one of the leading manufacturers of marine sewage treatment systems.

A down-to-earth view of container shipping



Longshoreman loading a container ship in Staten Island, New York.

Any business with marine risks needs specialized insurance broker planning. How Alexander & Alexander looks at container shipping will help explain how we will protect your maritime operations. In this case, we look through a shipper's eye. Tracking risks from inland depot to dock, from deck to destination.

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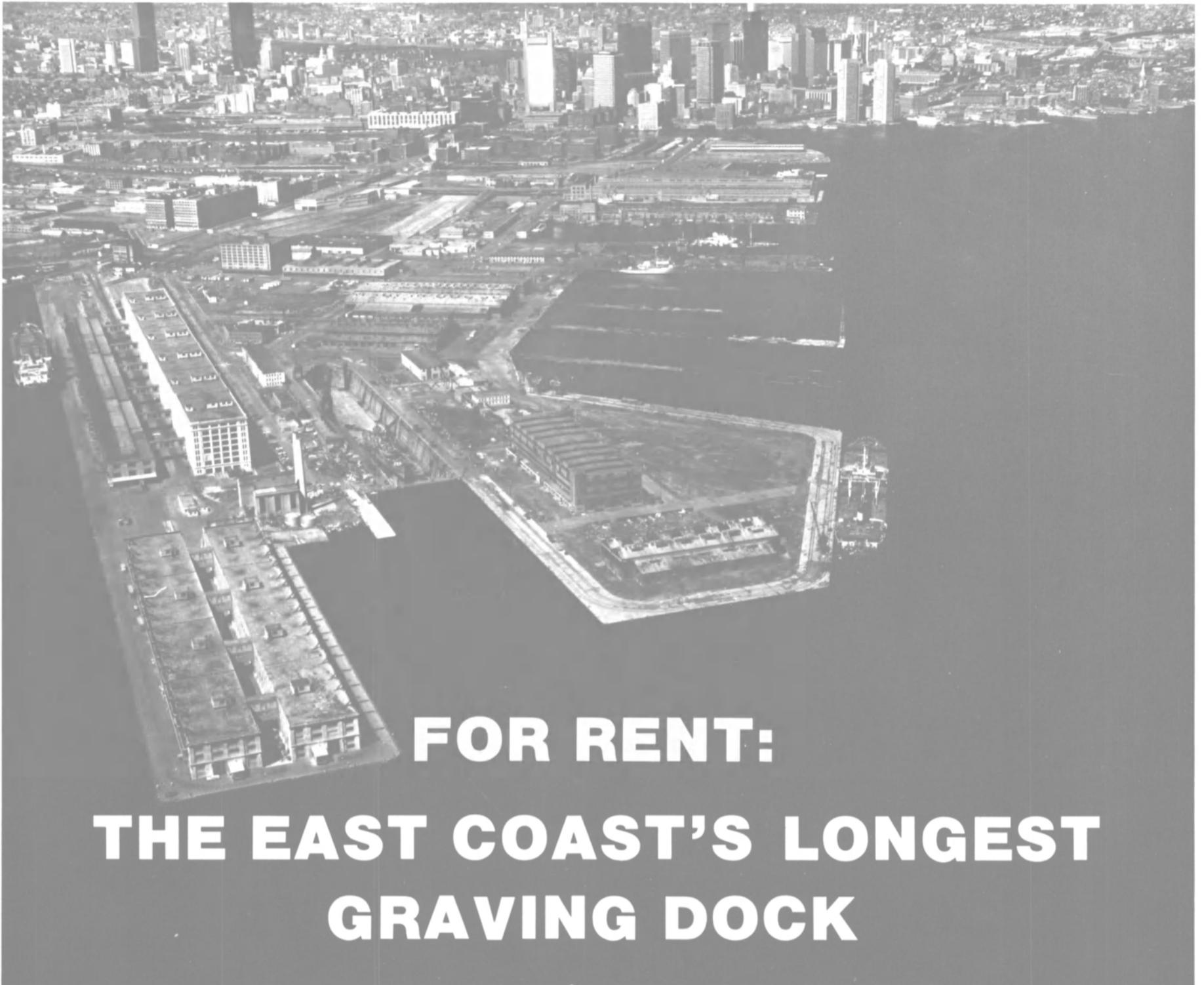
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From the client's point of view.



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The BMIP has an unbeatable location, less than 2 miles from downtown Boston, only 15 minutes from Logan International Airport.

Singly or in combination, BMIP facilities are now available to one or more companies engaged in the ship repair/ship building or other marine-related industry.

Call us for further information:

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Economic Development and Industrial Corporation of Boston
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BOSTON MARINE INDUSTRIAL PARK

Kevin H. White, Mayor, City of Boston

Frank Bronstein, Chairman, EDIC/Boston

**Combination Aluminum
Seiner Delivered By
Progressive Marine**



Fishing vessel *Kara-Matt*, a 68-foot aluminum salmon and herring drum seiner, was completed recently by Progressive Marine Installations Ltd. of New Westminster, B.C., Canada.

A 67-foot aluminum salmon and herring drum seiner built by Progressive Marine Installations Ltd. of New Westminster, B.C., Canada was delivered recently to Capt. **Ross Aleksich** of Vancouver, B.C. The 99-gt vessel has an overall length of 67 feet 11 inches, beam of 22 feet, and depth of 10 feet 2 inches.

Her main engine is a Cummins KTA-1150-M diesel with an output of 450 bhp. Other equipment includes Capitol reverse/reduction gear; two Ford diesel auxiliaries; Hytac hydraulic system, seine winch, and bow thruster; Harrison and Robbins anchor winch; Pumps and Power bilge, fire, and circulating pumps; and General Refrigeration chillers, receivers, condensers, and system components.

With a 7-man crew, the seiner has fuel capacity of 1,900 gallons, water ballast of 2,200 gallons, fresh water of 1,300 gallons, and fish hold capacity of 3,000 cubic feet.

**Westran Acquires Quaker
City Electric Valve Actuator
—Literature Available**

Westran Corporation recently announced the acquisition of the Quaker City electric valve actuator, formerly manufactured by the Quaker City Gear Works of Huntington, Valley, Pa.

With sales offices worldwide, Westran enters the market with \$3-million inventory of finished actuators and spare parts, and has an experienced team of field service engineers for installation and field service requirements.

For free literature on Westran's Quaker line 'E' and 'EV' Series of electric valve actuators, write for Bulletin FM-912, **Don Trott**, Director of Marketing, Dept. MR, Westran Corporation, 950 West Norton Avenue, Muskegon, Mich. 49441.

**Grain Transfer Facility Hull
Launched At Bergeron Yard**

Bergeron Industries, Inc., St. Bernard, La., has launched the K-2 for Rogers Terminal and Shipping Corporation, a subsidiary of Cargill, Incorporated. The unit is the hull for a floating grain transfer facility, and measures 330 feet by 75 feet by 15 feet. The facility will be completed in Greenville, Miss., by NCI of Minnesota, Inc.

When complete, the facility will transfer grain from barge to ship at a rate of 60,000 bushels per hour, and possess the capability of blending, sampling, analyzing, and storing product. Automatic scales provide for constant monitoring of cargo flow both from

the barges and to the ship, while completely enclosed conveyor systems, working in negative pressure enclosures, make the entire facility environmentally safe.

The hull was designed by Bergeron in conjunction with Swantec, Inc. of Minneapolis, and built at Bergeron's Braithwaite marine facility, located at mile 80.7 on the Mississippi River near the Port of New Orleans.

The installation of below-deck machinery and systems was accomplished prior to launch, with the erection of above-deck cargo-handling equipment ensuing after launch. Once completed, the unit will then be towed to its operating area and become the largest, most sophisticated facility of its kind.

This vessel is in keeping with Bergeron's policy of increased service to both domestic



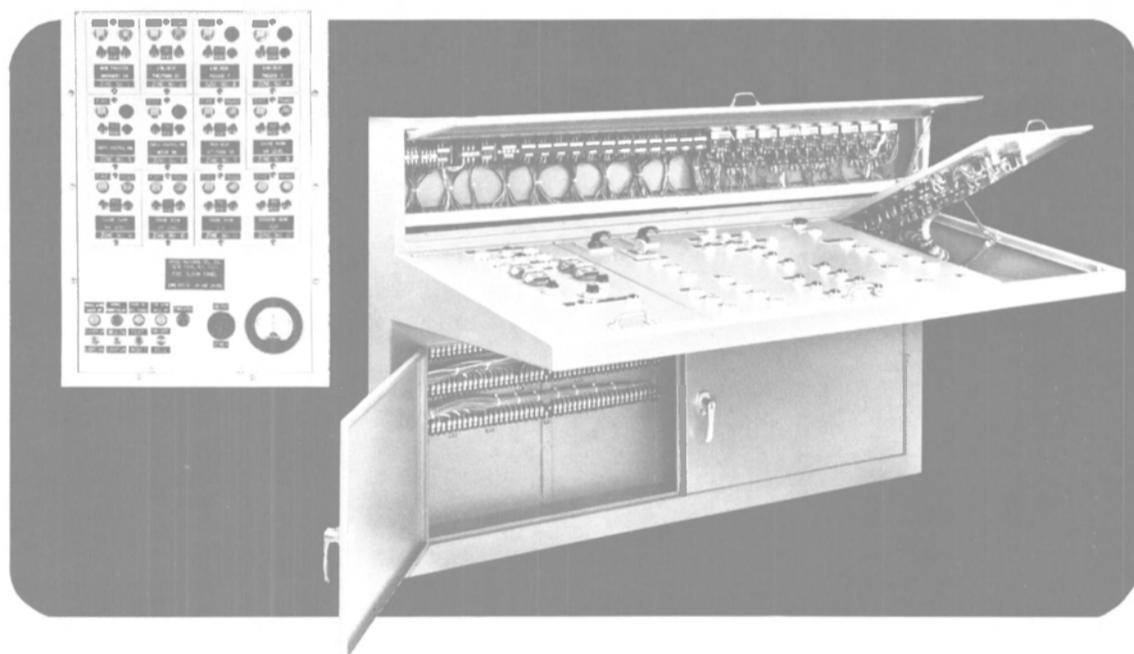
Side launching of 330-foot hull for a floating grain transfer facility took place recently at Bergeron Industries' yard in Braithwaite, La.

and international markets. With general offices in St. Bernard, and marine facilities at Braithwaite, La., and Port Bienville, Miss., Bergeron is one of the nation's leading designers and builders of marine equipment.

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**Joe Christopher Joins
Schnitzer-Levin Marine
As Engineering Manager**

Joe Christopher has joined Schnitzer-Levin Marine Company in South San Francisco as manager of engineering, according to Wallace Z. Levin, general manager of the firm.

Mr. Christopher comes to

Schnitzer-Levin Marine with international engineering experience, having managed the construction of 47 vessels, ranging from 35,000 deadweight tons to 406,000 deadweight tons, in five countries. In addition, he has managed construction of towboats and barges and major conversions.

Prior to joining Schnitzer-Levin Marine, he was manager of Construction and manager of main-

tenance and repair for Chevron Shipping. Prior to that he was superintendent engineer of Tankers Company in New York City.

He holds B.S. degrees in engineering from the Massachusetts Institute of Technology and the Massachusetts Maritime Academy.

Schnitzer-Levin Marine, part of the Schnitzer Group of companies, sells and repairs marine machin-

ery and equipment, and provides technical marine service for the repair of maritime vessels worldwide. Its headquarters is in South San Francisco with offices in Portland, Ore., and New York City.

**Barrios Joins Algiers
Iron Works & DD As
Chief Estimator**



Ted Barrios

Ted Barrios has joined Algiers Iron Works and Dry Dock Company as their chief estimator. He brings to the company some 30 years of experience in marine estimating of repairs and maintenance to river and offshore vessels.

Mr. Barrios has worked closely with owners' representatives and regulatory agencies in developing the best approach to repair projects. As a marine estimator for other firms in the Port of New Orleans, he has earned a reputation for his handling of vessel conversion and major repair jobs.

**New Small Probes Expand
Use Of Thickness Gage—
Literature Available**

Krautkramer-Branson has expanded the capability of its DM2 ultrasonic thickness gage with a selection of new, small probes. The DM2 is already well-known for its reliability in measuring wall thickness on corroded or eroded pipes and vessels, its penetrating power in castings, and its stable thickness readings at high temperatures. Four new 1/4-inch probes now extend application of the DM2 to include measurement of wall thickness on small-diameter tubing and stud-bored boiler tubes, as well as other limited-access inspections.

The new additions to the DM2 system include fingertip as well as extended housing designs. The KB-550-FH is a fingertip probe for ambient-temperature testing on rough and uneven surfaces over a wall-thickness range of 0.05 to 2.0 inches. Similar specifications are offered by the KB-550-BTH, except that its extended housing provides easier access to obstructed test surfaces such as stud-bored boiler tubes.

The KB-560-FL is a fingertip

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up to 50%
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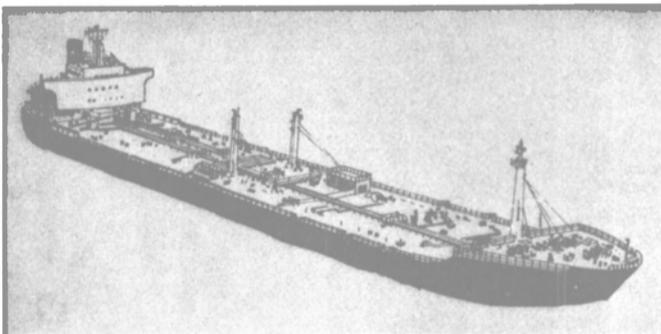


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probe for use on clean, very smooth surfaces such as new fabrications. Thickness range is 0.06 to 2.0 inches. Identical performance is offered by the KB-560-BTL, except that its extended housing can reach limited access surfaces.

A removable bell housing is available for use with all the new small probes, for testing on surfaces where access is not limited.

For free literature or more information on the DM2, write to **George Quinn**, Dept. MR, Krautkramer-Branson, Inc., 250 Long Beach Boulevard, Stratford, Conn. 06497.

\$14-Million Scrapping Facility To Be Built In Netherlands Antilles

Paul Loewenthal, U.S. Economic Commissioner for the Netherlands Antilles, recently announced that his government and West Germany's Eisen Und Metal A.G.

have signed an agreement in principle for a \$14-million, ship-breaking scrap yard in Curacao that will produce 85,000 tons of steel a year for the Latin American market. Construction of the facility will begin in early 1981.

According to **Mr. Loewenthal**, the Netherlands Antilles Government will provide \$7 million for the necessary infrastructure including piers and access roads, plus 85 percent of the cost of an additional \$7 million for equipment. To be located in the harbor of Willemstad, the yard will employ from 185 to 270 workers, depending on the ship breakage methods used. Additional jobs will be created in such related activities as preparing the vessels for scrapping.

Eisen Und Metal A.G., which has been active since the 1920s in the ship-breaking industry, is owned by three German companies—Hoescht/Estel, Mannesmann, and Rheinmetall, each holding a one-third equity.

Present plans call for the es-

tablishment of two separate companies in the Netherlands Antilles—a production company that will scrap the ships, in which the Government would have a majority of shares; and a trading company that will buy the vessels, market

the resultant scrap metal, and be involved in other commercial activities. The trading company would be a joint venture, owned equally by the Netherlands Antilles Government and Eisen Und Metal A.G.



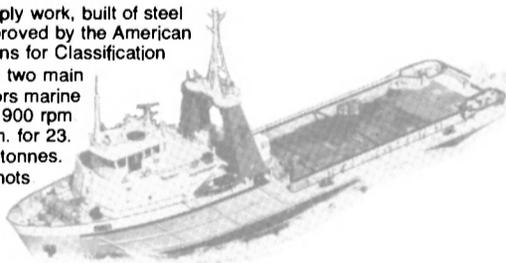
WELCOME ABOARD — Neill McAllister of McAllister Brothers, Inc. welcomed participants of a recent meeting of The Women's Traffic Club of New York aboard the Margaret M. McAllister for a tour of the harbor. The day's activities were sponsored by the Educational Program of The Women's Traffic Club of New York. The Women's Traffic Club of New York was organized in 1931 to bring together women engaged in freight and passenger traffic, transportation and related firms in the industry.

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Our modern flow-line shipyard has all the extras: On site fabrication shop/machine shop, superb building & launch facilities. 'in house' computer system handling 32 operating channels, computer based N.C. Cutting and we are in close proximity to major suppliers.

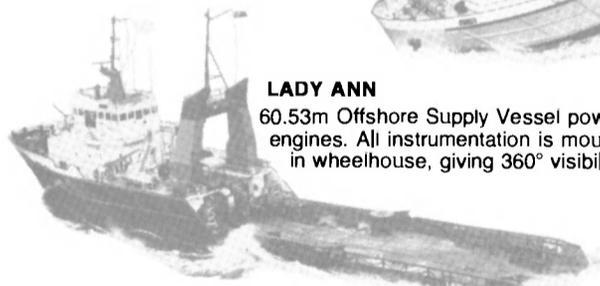
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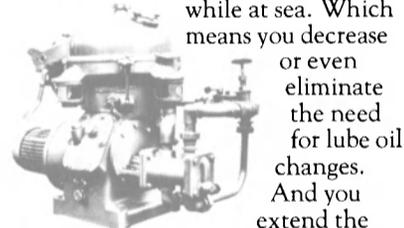
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European Agent: European Marine & Machinery Agencies, 60 Brookley Road, Brockenhurst Hants, SO47RA, U.K. Telex: 47509

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Photo courtesy of Ocean Marine Services.

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Phone 201-592-7800 for the name of your nearest Alfa-Laval marine representative.



ALFA-LAVAL





DRAVO VIKING LAUNCHED—The Karen Mott was launched recently into the Ohio River from Dravo Corporation's Neville Island shipyard near Pittsburgh. The 5,600-bhp towboat, 52nd of Dravo's Viking class, is owned and operated by American Barge Lines of Greenville, Miss., and is named for the wife of a company owner. The vessel

is 168 by 42 feet with an 11-foot draft, and is powered by two fuel-efficient 2,800-bhp EMD 16-645E7B General Motors diesel engines. The Karen Mott will be the third Viking in American Barge Lines' fleet.

Jackup Rig For Marine Drilling Commissioned At Beth-Beaumont

Marine Drilling Company of Corpus Christi, Texas, and Bethlehem Steel Corporation's Beaumont shipyard recently commissioned a 200-foot water depth mobile offshore drilling vessel. **James C. Storm**, president of Marine Drilling, said this jackup is the third to be delivered this year by Bethlehem to his company. During the christening ceremonies, **Mrs. Joyce I. Hudson**, wife of **Carroll D. Hudson**, vice president of East Texas District, Arco Oil & Gas Company, commissioned the rig **J. Storm XIV**. Upon delivery,



Sponsor of drilling vessel **J Storm XIV** was **Mrs. Joyce I. Hudson**, wife of **Carroll D. Hudson**, vice president of Arco's East Texas District. Looking on is Beaumont yard general manager **Sherman C. Perry**.

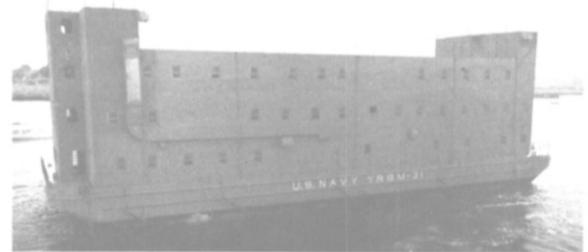
the unit will work in the Gulf of Mexico for Arco Oil & Gas Company.

The mat-supported jackup features a cantilevered substructure and offers the capability of being able to position its drill floor over existing offshore production platforms in order to drill development wells or to re-work existing wells.

On location, **J. Storm XIV** will have a total variable load capacity of 4.5 million pounds, which includes hook plus setback loads of one million pounds on wells as far as 39 feet aft of the platform deck. The maximum cantilever load capacity at 45 feet is 850,000 pounds.

The new vessel consists of a platform that is 157 feet by 132 feet supported by three 11-foot-diameter columns fixed to a large stabilizing mat that is 220 feet long and 185 feet wide. Outfitted with deep-well drilling equipment, the rig will be able to operate in waters up to 200 feet deep during non-hurricane season and withstand hurricane forces resulting from 100-knot winds and 60-foot seas in water depths up to 175 feet.

The **J Storm XIV** contains onboard, air-conditioned living accommodations for 50 people, complete with sleeping quarters, galley, recreation room, laundry, and rest rooms, and is built to comply with U.S. Coast Guard and American Bureau of Shipping standards for mobile offshore drilling units.



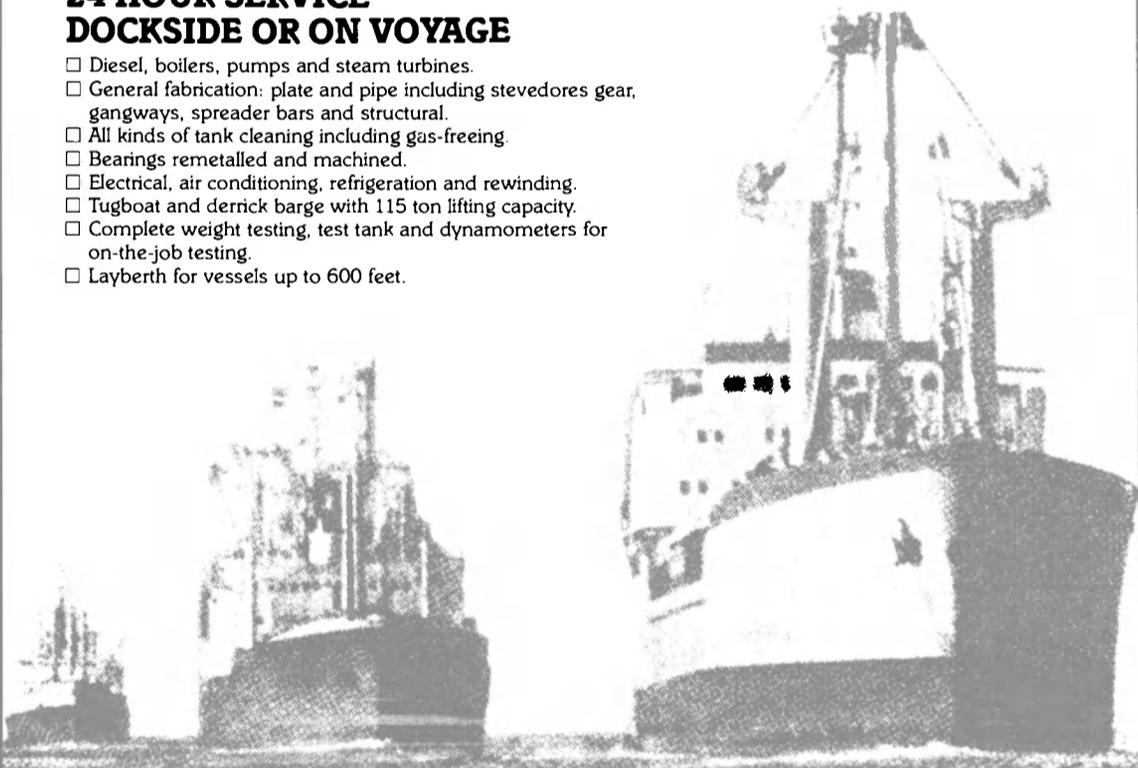
BERTHING BARGE LAUNCHED — **Marinette Marine Corporation**, **Marinette, Wis.**, recently launched the first in a series of six **Large Yard Repair Berthing and Messing Vessels** for the U.S. Navy. The **YRBM (L)** vessels are being built under a contract from the **Naval Sea Systems Command**. The vessel is 146 feet overall length, 46-foot beam, and a 688 long ton displacement. A total of 201 enlisted men, 26 officers, and 30 chief petty officers will be accommodated within the vessel. Additional features include recreation rooms, machine shop areas, galley, and instructional classrooms. The first two vessels are scheduled for delivery in December 1980, with subsequent deliveries of two each in June 1981 and December 1981.

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

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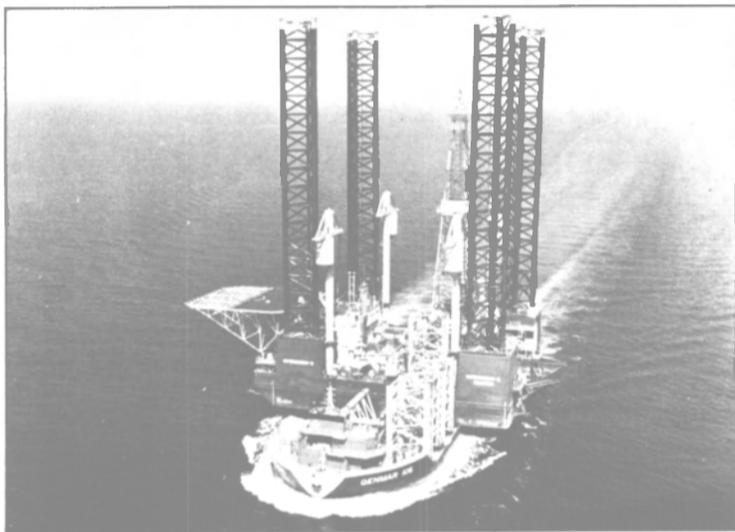


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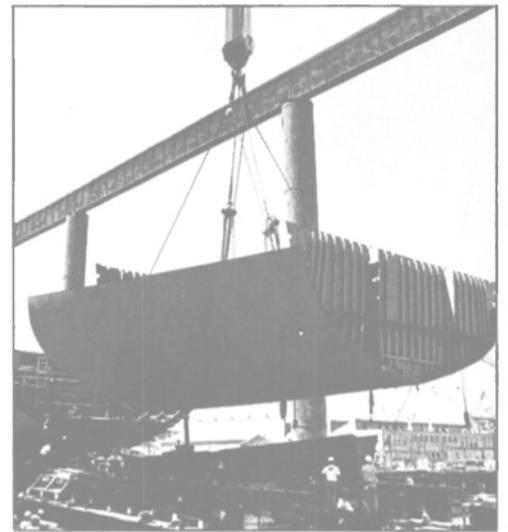
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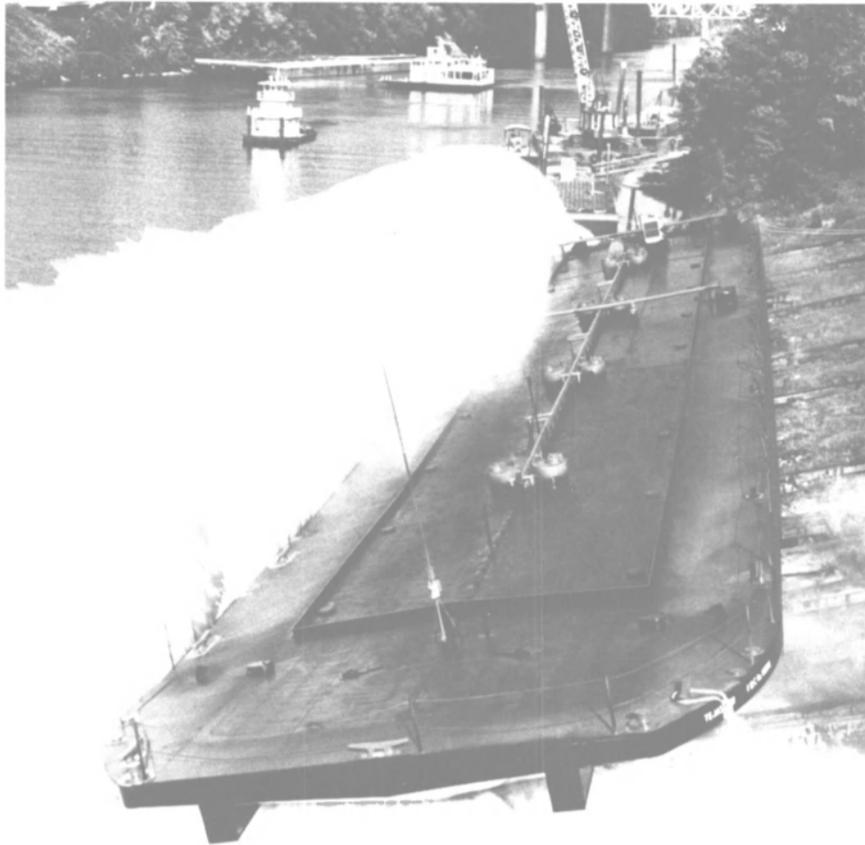
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MacGregor Will Provide Two Service Stations In People's Republic

An agreement providing two MacGregor service stations at Chinese ports has been signed by MacGregor Cargo Handling Company (Pacific) Limited, Hong Kong, and China Ocean Shipping Company (COSCO), of Peking. The agreement makes provision for servicing virtually the full range of MacGregor-designed equipment, hatch covers, and RO/RO. The stations are located at the principal ports of Shanghai and 935 nautical miles to the south at Whampoa (Huangpu).

As part of MacGregor's strict code of practice concerning service stations, manning will be by experienced service engineers trained in MacGregor technology and, of equal importance, the station will be stocked with a comprehensive range of MacGregor spare parts.

To implement this, four key Chinese personnel have been undergoing intensive training over the past three months at MacGregor Land & Sea's U.K. headquarters located at Seaton Delaval, Whitley Bay. The party, all graduates of technical colleges or universities, included a manager from COSCO's technical department, a supervisor from the COSCO voyage repair station and two technically trained interpreters. On return to China, they in turn will manage the stations and act as tutors, passing on their newly acquired knowledge of MacGregor cargo access equipment to the technicians who actually under-

take the repairs and maintenance. Each station will have a staff of six.

Karl Mueller Named Bulk/Tanker Manager At Barber Steamship

Karl G. Mueller has been named manager of the Bulk and Tanker Agency Department of Barber Steamship Lines' Gulf Division New Orleans office, it was announced by Robert H. Pouch, president.



Karl G. Mueller

Captain Mueller has a broad background and experience in the various aspects of shipping, having spent his early years at sea and eventually sailing as master, chiefly on bulk carriers. Subsequently, he spent a period of time with the port authority of Hamburg, Germany, and during the last few years he worked with a well-known New Orleans steamship agency, primarily in their bulk and tanker agency department.

He is a graduate of the Merchant Marine Academy in Hamburg, Germany.



Marinette Marine Awarded Contract For 10 YRBM (L) Vessels

Marinette Marine Corporation (Marinette, Wis.) has been awarded a contract by the Naval Sea Systems Command for the construction of 10 Large Yard Repair Berthing and Messing Vessels.

The YRBM (L) vessels have a 146-foot overall length, 46-foot beam, and a 688 long ton displacement. A total of 201 enlisted men, 26 officers, and 30 chief petty officers will be accommodated within the vessel. Additional features to crew facilities include recreation rooms, machine shop areas, galley, and instructional classrooms.

The vessels are being built under a multiyear procurement, with the first vessel scheduled for delivery 23 months after the date of contract. Value of the 10 vessel contract is in excess of \$68,000,000.

Marinette Marine previously had been awarded a contract for six YRBM (L) vessels in 1979 from the Naval Sea Systems Command. Delivery of the first and second unit of this contract is scheduled for December 1980.

Marinette Marine Corporation is a major supplier of custom engineered vessels for ocean and inland marine service.

H.Z. Shelton Appointed Vice President-Finance For Sun Ship, Inc.

Henry Z. (Hal) Shelton has been elected vice president-finance for Sun Ship, Inc. He was also elected a member of the board of directors and corporate secretary-treasurer. In his new post, Mr. Shelton is responsible for directing all of Sun Ship's financial functions. He replaces George C. Liacouras, who has retired.

Mr. Shelton joined Sun Ship as vice president of financial planning in February 1980. In this capacity, he assisted in maintaining the shipyard's corporate financial functions as well as implementing changes resulting from Sun Ship's new technology and systems. His previous post was director of finance and systems for Sunmark Industries, the marketing portion of Sun Company.

Savage Named General Manager-Port Sales For NY&NJ Port Authority

The appointment of John E. Savage as general manager of port sales to succeed Hendryk S. Weeks who has retired, it was

announced recently by Anthony J. Tozzoli, director of the Port Department of The Port Authority of New York and New Jersey.

Mr. Savage, who previously was special assistant to Mr. Tozzoli, has been given major responsibility for the management of shipper-oriented programs to route oceanborne cargoes via the Port of New York and New Jersey. He will be in charge of

the Authority's headquarters sales unit in New York, as well as its regional sales offices in Chicago and Cleveland. He will also supervise port sales activities of the bi-state agency's overseas offices in London, Zurich, and Tokyo. He will report to Robert N. Steiner, assistant director of the Port Department.

Mr. Savage joined the Port Authority in 1962 as a management

trainee, and was promoted successively to positions of increasing responsibility for promotion, planning and administrative activities in a number of Port Authority departments. Most recently, he served for two years as assistant manager of Port Newark and the Elizabeth-Port Authority Marine Terminal, before his last assignment to the director's office.

Twin Disc extends marine transmission line for engines up to 3617 kW (4850 bhp).

Now Twin Disc offers the North American marine industry five new series of marine reverse and reduction transmissions for higher horsepower diesel engines. Twin Disc has extended its line of domestically manufactured transmissions to include higher horsepower models from its partially-owned affiliate Niigata Converter Company Limited (NICO). This means the superior reliability, performance and operating economics typical of Twin Disc Marine Transmissions are now available here in greater horsepower capacities than ever.

These larger, coaxial (inline) marine transmissions are designated Models MGN-650BZ, MGN-1000AZ, MGN-1600AZ, MGN-2200AZ and MGN-3200AZ. In addition, special designs and other NICO models are available in production quantities to meet specific installation and application requirements.

The MGN-Z Series Features:

- Coaxial input-output shaft arrangement for lowered propul-

sion package center of gravity.

- Wide variety of models and ratios to meet various propulsion requirements.
- Use same type oil as specified for the engine.
- Carburized, hardened and precision finished single helical gearing, anti-friction bearings, and hydraulically-actuated clutches are the principal members of the uniquely-designed gear train resulting in a dimensionally compact, low weight, high efficiency transmission.
- Prompt, smooth shifting, integral hydraulic forward and reverse clutches respond to operator requirements for good vessel maneuverability. The "X" control is available as an option which permits variable propeller speed independent of engine speed.
- Housing design and strategic placement of access covers provides for easy inspection and maintenance, even in compact engine rooms.

The MGN-Z Series, like all Twin Disc Marine Transmissions, are backed by Twin Disc's warranty program with Approved Renewal Parts available from Twin Disc. For more information on the new coaxial MGN-Z Series contact Twin Disc, Incorporated, Racine, WI 53403, U.S.A. Telephone (414) 634-1981, Telex 264432.

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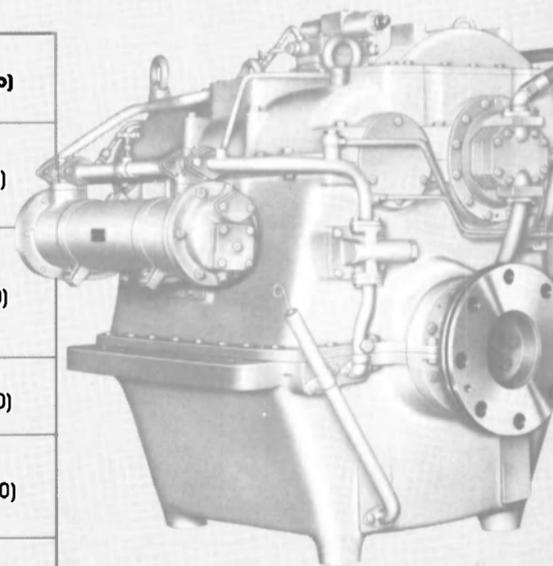


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Model MGN-Z Series

MARINE TRANSMISSION MODEL	NOMINAL RATIOS	GOVERNED ENGINE SPEED RANGE*, RPM	POWER RANGE* kW (hp)
MGN-650BZ	3.0:1 3.5:1 4.0:1 5.0:1 6.0:1	700-1800	634-895 (850-1200)
MGN-1000AZ	3.0:1 4.0:1 5.0:1 6.0:1 7.0:1 8.0:1 9.0:1	700-1800	634-1119 (850-1500)
MGN-1600AZ	3.0:1 4.0:1 5.0:1	700-1700	1119-1641 (1500-2200)
MGN-2200Z	3.0:1 3.5:1 4.0:1 4.5:1 5.0:1	700-1600	1491-2237 (2000-3000)
MGN-3200Z	3.0:1 4.0:1 5.0:1	700-1400	2610-3617 (3500-4850)

*Depending on ratio, type of duty, input speed and survey society classification requirements. Certification certificates available from ABS, LRS and other major survey societies.



Model MGN-650BZ

**A.I. Levy Named Chairman,
J.J. Alcina President Of
Arthur Levy Enterprises**

Arthur Levy Enterprises, Inc. has announced that Arthur I. Levy Sr. was recently appointed chairman and chief executive officer. Mr. Levy has been active in providing marine transporta-

tion services to the offshore oil industry since 1946.

John J. Alcina has been promoted to president and chief operating officer of the company. He entered the industry 25 years ago working offshore, and was promoted to various supervisory positions. Formerly vice president of domestic operations with Arthur Levy Boat Services, Inc.,

Mr. Alcina joined Arthur Levy Enterprises in 1977

Timothy J. McKeand was elected vice president and treasurer. He worked with the CPA firms of Ernst & Ernst and J.K. Lasser prior to joining Arthur Levy Enterprises in 1976.

Arthur Levy Enterprises, Inc. and its affiliate, Offshore Island Boats, Inc., provide marine trans-

portation services with a fleet of 16 towing/supply vessels to the offshore oil industry.

**South African Ship
Repair Company
Changes Hands**

Messrs. Elgin-Murray Marine (Pty) Limited, operators of a ship repair service in Cape Town, has been taken over by Globe Engineering Works, Limited, the major ship repair company in the area. This takeover and expansion of facilities by Globe means better service to shipowners carrying out repairs in Cape Town.

Tom Larkin is operations manager of the enlarged complex, and he heads a team with experience in all aspects of ship repairing, from voyage repairs to major refits, conversions, and renovations.

Agent in the U.S. for Globe is James R. Porter of Porter Continental Marine, Inc., 250 Park Avenue, New York, N.Y. 10017.

**New Instrument Monitors
Chlorine Residuals—
Literature Available**

EPCO, developer and manufacturer of OEM electronics for the pollution control industry, has introduced an instrument capable of continuous monitoring and recording of chlorine concentrations in waters at 1-500 parts per billion concentration levels.

Known as the Chlortect chlorine monitor, their instrument was developed at the National Bureau of Standards and is the result of an increasing need to monitor chlorine residuals, on site, with high sensitivity and reliability. The technology is based on the principle of amperometric measurement of iodine, produced via chemical reaction to active chlorine in the sample water with a potassium iodide reagent. An internal calibration system which coulometrically generates an accurately known amount of iodine, eliminates the need to calibrate the system with standard solutions.

The Chlortect is supplied in rack-mountable configuration with standard ac power supply, and is available with optional dc battery pack for remote use in field monitoring. It is adaptable to saline, fresh, or brackish water and is applicable to any industry, especially those subject to EPA regulations where chlorinated waste water discharges must be monitored.

For free literature containing complete details, write to EPCO, Dept. MR, 5 Newtown Road, Danbury, Conn. 06810.

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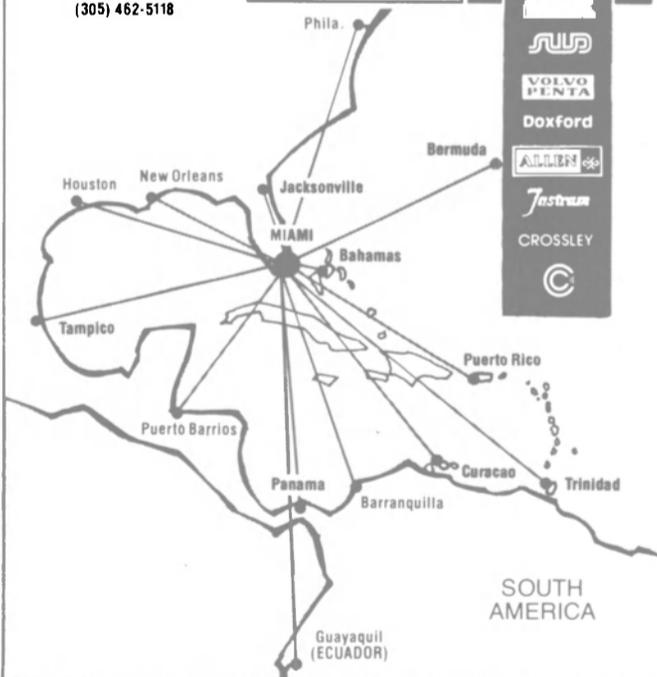


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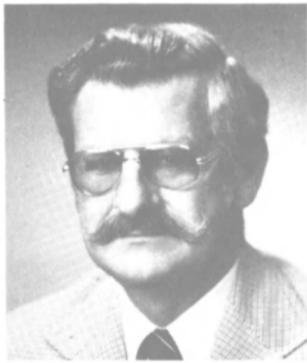
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**J.V. Bishop Appointed
General Manager
Of Dixie Dredge**



James V. Bishop

James V. Bishop has been appointed general manager of The Dixie Dredge Corporation, a wholly owned subsidiary of St. Louis Ship. The announcement was made by Edward Renshaw, the president of St. Louis Ship, a wholly owned subsidiary of Pott Industries Group. Pott is a member of the Houston Natural Gas Corporation group of companies.

Mr. Bishop's previous position at Dixie Dredge was manager of marketing. He joined the company in 1977 as general sales manager.

**D.S. Kern Appointed
Senior Sales Engineer
At Raytheon Marine**

Donald S. Kern has been appointed senior sales engineer at Raytheon Marine Company, Manchester, N.H. Raytheon is a leading manufacturer of marine electronics equipment for oceangoing vessels, commercial fishing and workboats, and pleasure craft.

Mr. Kern joined Raytheon as a sales engineer in 1977. Prior to that, he served 10 years as an officer in the U.S. Navy with duties as a navigator, pilot, and aircraft commander for the evaluation and testing of advanced radar, airborne optics, and oceanographic systems.

**Gulf Fleet Marine
Announces Four
Staff Appointments**

Gulf Fleet Marine Corporation, headquartered in New Orleans, recently announced the following personnel changes. Richard N. White has been named sales representative for the Houston office. He has 11 years of marketing experience in marine transportation, and will be involved in marketing the services of the company's fleet of offshore tugs, supply, and towing/supply vessels and offshore deck barges.

Rodney J. Duplantis also has joined Gulf Fleet as sales representative for the Morgan City,

La., office. He has worked for 19 years in various capacities in the petroleum industry and has devoted the past five years in marketing tug and supply boat services in the Gulf Coast area.

Ralph C. McIngvale, currently sales representatives in Gulf Fleet's Houston office, will be transferred to the Harvey, La., office and will be involved in mar-

keting efforts in the New Orleans area.

All three men will report to Jim Barrett, domestic sales manager, also located in Harvey.

Richard J. Jacob has joined Gulf Fleet's Latin American Division as marine superintendent. He has 20 years of experience in engine maintenance and repair as well as marine operations. Mr.

Jacob will be responsible for development of preventive maintenance procedures, supervision of repair activities and the coordination of operations with the operations of repair activities and the coordination of operations with the operations managers in Mexico and Brazil. He reports to Roger T. White, vice president-Latin America.

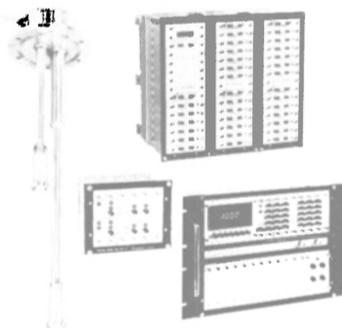


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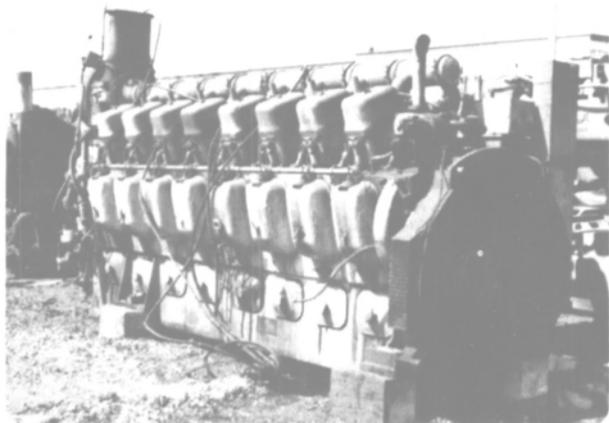
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Sino-American Maritime Accord Announced By Commerce Department

Secretary of Commerce **Philip M. Klutznick** has announced that the United States and the People's Republic of China have reached accord on a bilateral maritime agreement. Terming it a historic agreement that will officially foster expanded U.S. and PRC shipping services linking the two countries, Secretary **Klutznick** said it also will provide further momentum to the growth of Sino-American trade.

The text of the agreement, which includes reciprocal provisions governing cargo sharing, port access, tonnage duties, and treatment of crews, was initialed in Beijing (Peking) by **Samuel B. Nemirow**, Assistant Secretary of Commerce for Maritime Affairs, and **Dong Huamin**, Director of the Foreign Affairs Bureau of the PRC Ministry of Communications. Formal signing of the agreement took place in Washington recently.

"The normalization of our commercial relations with the People's Republic of China offers substantial economic benefits to both nations," Mr. **Klutznick** said. "This agreement will provide a firm foundation for the equitable participation by the U.S. and PRC merchant fleets in the burgeoning trade moving between our two countries."

Under the cargo-sharing provisions, the U.S. and PRC fleets will each be entitled to carry at least one-third of the bilateral trade. The agreement also provides U.S. and PRC ships with accelerated access to each other's ports.

Two-way trade between the PRC and the United States totaled \$2.3 billion in 1979, and is expected to reach about \$4 billion this year. By 1985, annual U.S.-China trade should reach at least \$10 billion, Secretary **Klutznick** said. The United States has been exporting to the PRC about three times as much as it imports, according to Commerce Department figures.

Promet Launches First Of Kind Vessel For National Marine



Correction. In the September 1 issue of **MARITIME REPORTER** and **Engineering News**, the vessel shown above, the NMS 401, was incorrectly identified as belonging to National Marine Service of St. Louis. The vessel is owned wholly by National Marine Services (NMS) of Abu Dhabi, United Arab Emirates. The NMS of Abu Dhabi, U.A.E., is a joint venture company, formed in 1978 by the board of directors, headed by H.E. **Shaikh Tahnoon**, of the Abu Dhabi National Oil Company (ADNOC), and by **Hugh C. Jackson**, president, and **Gene Domaschk**, vice president of the well-known U.S. tug and supply boat firm of Jackson Marine Corporation (a Halliburton Company).

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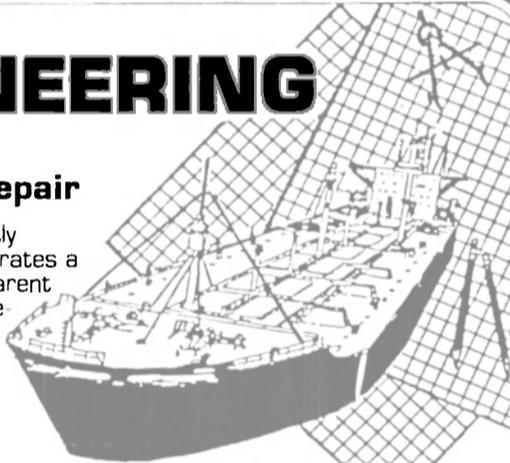
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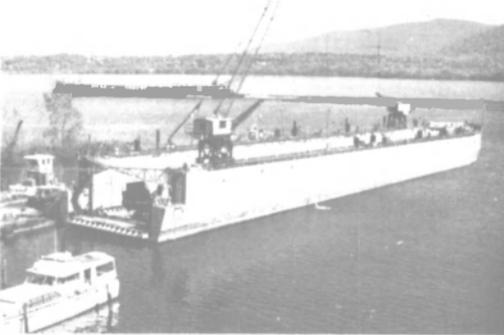
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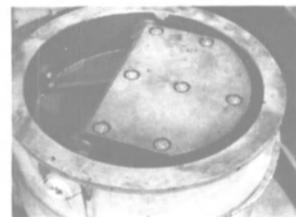
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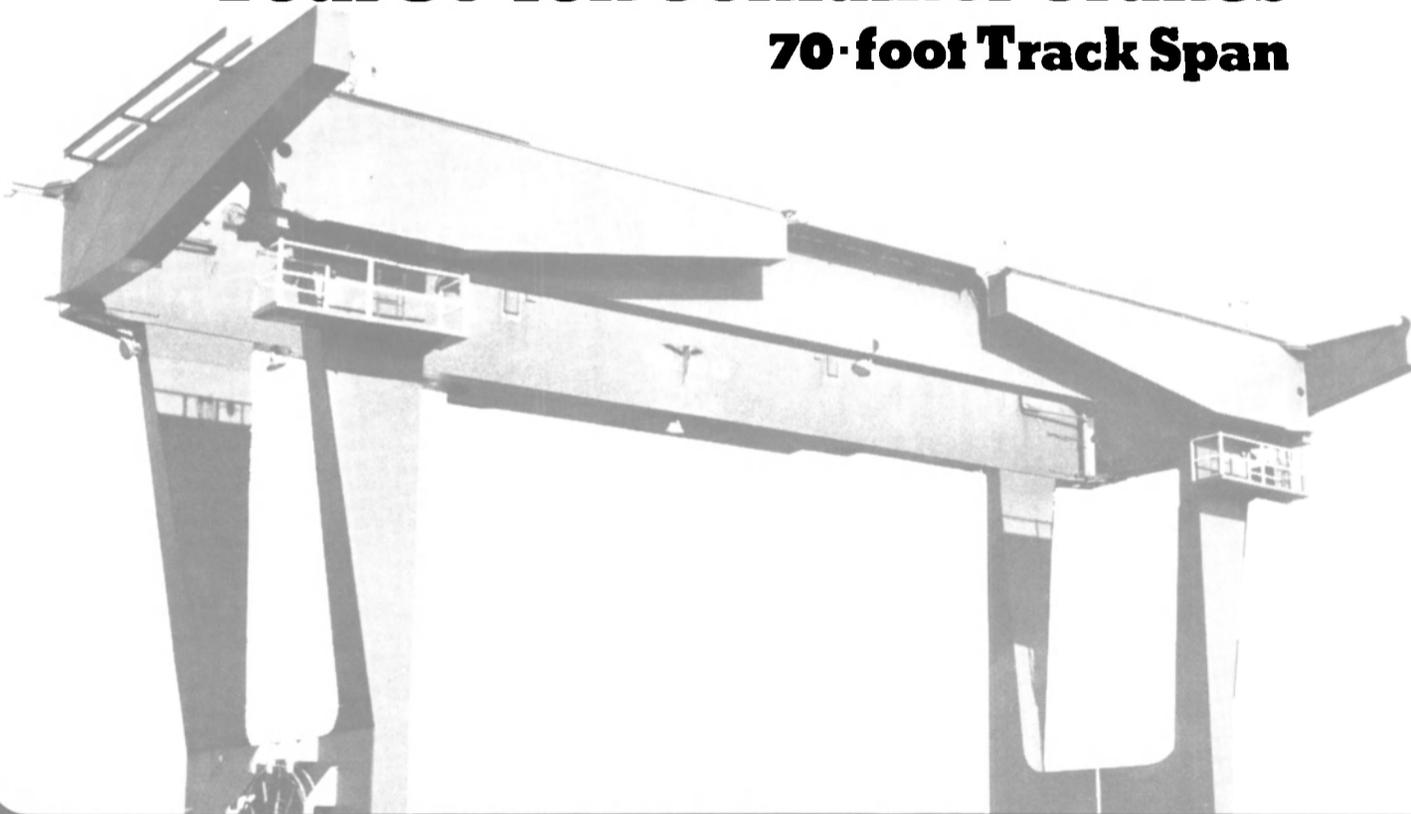
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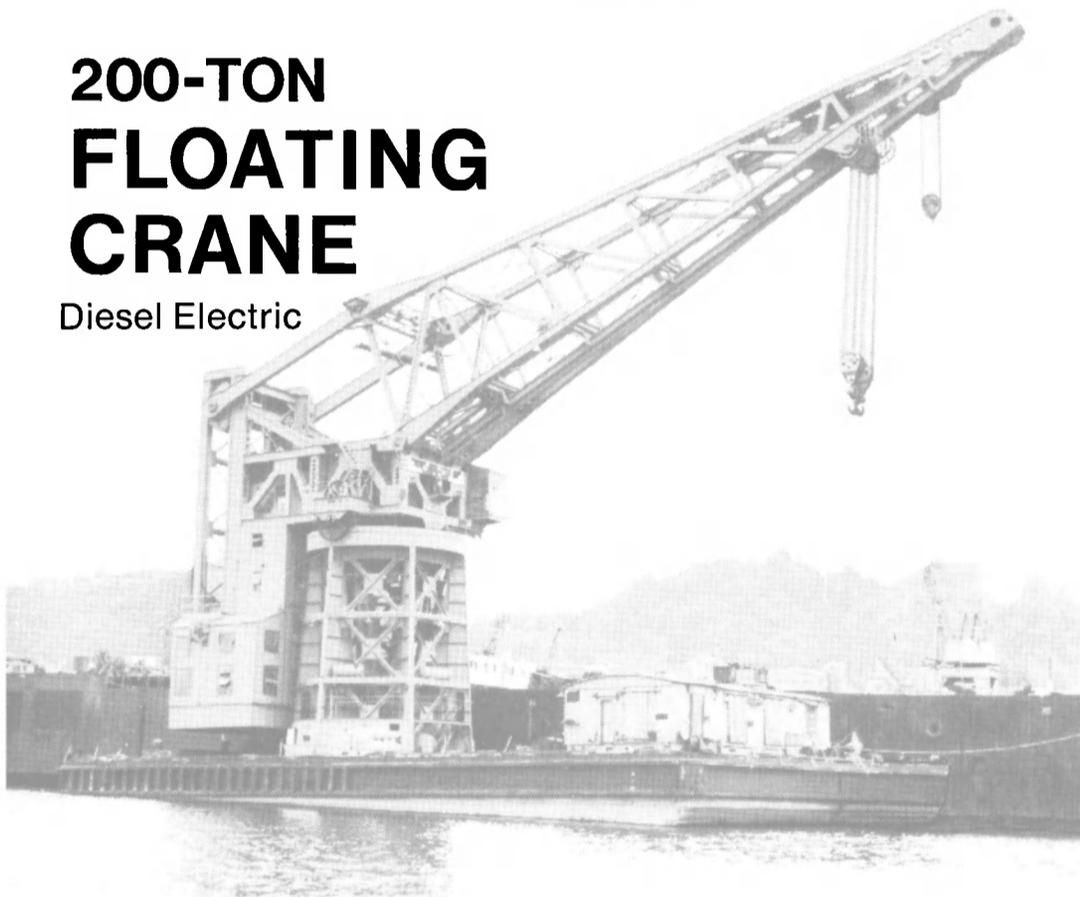
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HEAVY DUTY CAST ALUMINUM marine floodlights—series 48116—ADE 16. U.L. Marine listing 595—also USCG accepted. Mogul base—will handle 1000 watt incandescent or clear metal Halide bulb. Corrosion-resistant—hinged door.

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313 E. Baltimore St. Baltimore, Md. 21202
Marine Warehouse (301) 752-1077

NEW — UNUSED FLUSH HATCHES

14-DOG

54" X 66" and 54" X 77"
14 Dog—operated from top side by T-Key, with dogs marked to show open & closed positions.



4-DOG

24" X 30"
and
30" X 30"



4 Dogs on underside. Top side is flush and dogs are operated with T-Key openers.

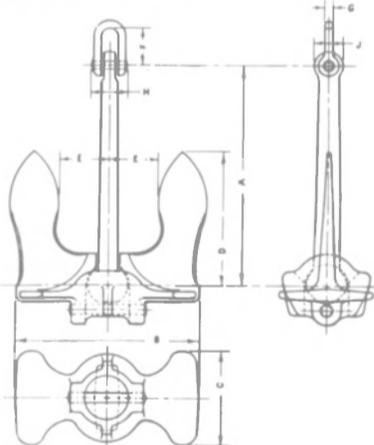
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ANCHORS — CHAIN

DETACHABLE LINKS

PEAR-SHAPED DETACHABLE LINKS



LARGE BALDT-TYPE ANCHORS

16000 LBS/12000 LBS/8000 LBS/3000 LBS

10 EA. 5" x 15" I.D. STEEL RINGS
3 EA. R.P. ANCHOR SHAX 3 7/8" STK, 3 7/8" PIN

NEW CHAIN

10 X 90 Ft. 3" DILOK CHAIN — ABS
9 X 90 Ft. 2" DILOK CHAIN — ABS

NEW SWIVELS

3 EA. 2 5/16" — 3" E&E SWIVELS
13 EA. 3 7/8" DETACHABLE LINKS

PEARSHPED DETACHABLE LINKS

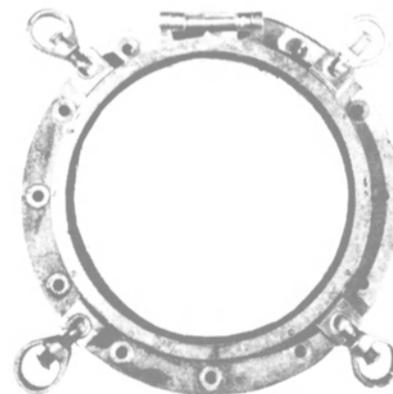
25 EA. #7 — 17 EA. #5

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15 1/2" & 16" CLEAN BRASS 4-DOG MARINE PORTLIGHTS

15 1/2" CLEAR OPENING
16" CLEAR OPENING

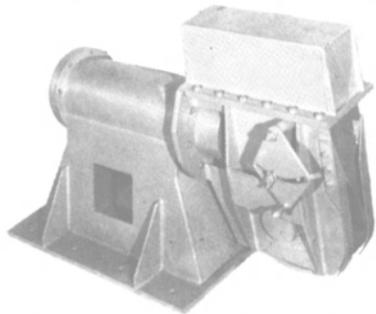


Recently carefully hand removed from ocean vessels. Suitable for re-use on shipyard conversions or for marine ornamental use. Heavy marine standard glass . . . clear or can be furnished frosted for use in special locations.

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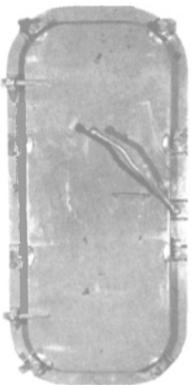
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NEW — UNUSED — 1 1/4" SELF-ALIGNING FAIRLEADS



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QUICK-ACTING LEVER OPERATED WATERTITE DOORS
26" X 66"
8-DOG
Rights & Lefts

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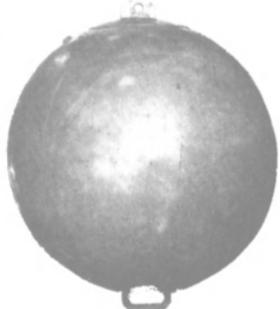
SURPLUS BERGER FAIRLEADS



2 Model 620 — for 1 1/2" wire — 20" sheave. Located San Francisco, Ca.
3 Model 614 — for 1 1/4" wire — 14" sheave. Located Panama City, Fla.

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NEW — UNUSED SPHERICAL MOORING BUOYS

About 58" diam. With tieplates top & bottom. Est. wt 680 lbs each. 120 lbs submergence

CYLINDRICAL BUOYS

3 Available — 5 ft X 9 ft — with wood bumpers

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— FOR SALE —

AFTER REMOVAL FROM

"R.V. ALCOA SEAPROBE" — BUILT 1970-71

ONE OF THE MOST ADVANCED DEEPSEA SEARCH AND EXPLORATION VESSELS EVER BUILT!

Equipment is immediately available for inspection and is still aboard the ship

FOR TUGS, FERRIES, CRANES, EXPLORATION, ETC.

ALL EQUIPMENT FOR AUTOMATIC PILOT & STEERING CONTROL

including

2 VOITH SCHNEIDER CYCLOIDAL OMNI-DIRECTIONAL PROPULSION UNITS WITH DYNAMIC POSITIONING CAPABILITIES
and
ELECTRO-HYDRAULIC WINCH FOR HANDLING UNDERWATER PHOTOGRAPHIC EQUIPMENT & TV CAMERAS & SCANNERS

Winch handles 10,000 feet of 1 1/2" electric cable. Unit is complete with slip rings & level wind. Mfg by Swann, Ltd.

SUBJECT TO PRIOR SALE, ONBOARD EQUIPMENT INCLUDES:

2 VOITH SCHNEIDER CYCLOIDAL OMNI-DIRECTIONAL PROPULSION UNITS

Size 24/E150 — 6-blade stainless steel propellers — blade orbit 2400mm — blade length 1500mm. Complete with Voith Schneider reduction gears AD40 and spare parts.

PROPULSION MOTORS

2 800HP 440/3/60 — 1775 RPM — squirrel cage — mfg by Electric Machine Co. — with 2 propulsion motor switchboards.

AUTOMATIC STEERING SYSTEM PILOT HOUSE CONTROL — ITT DECCA CONSOLES

2 Decca Arkkas steering systems complete with autopilot and provision for automatic positioning (X-Y) input. This system controls 2 Voith Schneider propulsion units with complete redundancy for backup and dynamic station keeping. The Decca consoles are located with one on bridge and one in Control Search Center.

- 3 Baldt-type anchors — 4230 lbs ea.
- 2 26' Aluminum lifeboats — oar propelled — 50-person — 530 cu ft — USCG approved
- 2 Sets of lifeboat davits for above lifeboats
- 3 Berger fairleads — 1 1/4"
- 2 Kohlenberg air horns — model D2
- 2 30HP Quincy compressors — 7 1/2 X 4 X 4 — air cooled — 75 CFM @ 200 PSI — belt-driven by 440/3/60/1700 motor
- 83 Kearfott windows, fixed aluminum frames, 19" X 28"
- 4 Kearfott crank windows, aluminum frames, 19" X 28"
- 5 Kearfott windshield wipers — 18" blade — model K3-9120
- 14 Mooring bits — 10"
- 12 Panama chocks
- 11 Steel fire doors — 26 3/4" X 74"
- 7 Watertight doors — 6-dog — 32" X 54"
- 8 Watertight doors — 6-dog — 32" X 66"

WARPING CAPSTAN

8500 lbs @ 90 FPM or 4250 lbs @ 180 FPM. Below deck mounted motor — 30 HP — 440/3/60 — with control

5-TON CRANES

2 — Pitman Hydrolift pipe-handling 5-ton cranes — Model HL100B

LIFEBOAT WINCHES

2 — CG approved No. 160,015/75/0 type 31-H — 6200 lbs w/load on single line — 13,000 lbs on 2 part line. Mfg by Marine Safety Appliance Co.

FLASH EVAPORATOR

Maximum Flash Evaporator — 3000 GPD — Cuna Engineering Corp. — complete with all pumps

250KW DIESEL GEN.

2 — 250KW GM12-71T 1800 RPM diesel generators — E.M. Bemac II — synchronous — 440/3/60. Complete switch-gear — freestanding type

EMERGENCY 40KW GEN.

Hercules model D4300 — 40KE — 50KVA — 64 amps — 440/3/60 — 1800 RPM — complete with emergency transfer switches & panels for automatic startup on power failure

WALZ & KENZER USCG APPROVED HEAVY DUTY SLIDING DOORS W/FRAMES

- 1 36" X 66" Horizontal hand mech. steel sliding door — complete with local & remote gear boxes & complete frame
- 1 60" X 78" steel watertight sliding door & frame. Complete with local and remote boxes
- 1 36" X 66" Steel watertight sliding door complete with local and remote gear boxes — electro-hydraulic

ALL THE ABOVE OFFERINGS CAN BE SEEN ABOARD "R.V. ALCOA SEAPROBE" Located Panama City Port Authority Docks — Panama City, Florida

FOR INFORMATION CONCERNING PRICES & INSPECTION ARRANGEMENTS WRITE, PHONE, CABLE: H.B. CHAIT, V.P.

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PHONE: (301) 539-1900

Baltimore, Md. U.S.A. 21202
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Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
R.W. Fernstrum & Company, 1716 Eleventh Avenue, Menominee, MI 49858
James D. Noll Co., Inc., 3195 NW 20th Street, Miami, FL 33142
York Division (Borg-Warner Corp.), P.O. Box 1592, York, PA 17405

ANODES—Cathodic Protection

Kaiser Aluminum & Chemical Corp., 300 Lakeside Dr., (Rm 1139KB), Oakland, CA 94643

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Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44052
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309
Morse Chain Company, Div. Borg Warner, So. Aurora St., Ithaca, N.Y. 14850
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186

BLASTING—Cleaning—Equipment

Butterworth Systems Inc., 224 Park Ave., Florham Park, NJ 07932
GMMC/Porta-Shotblast, 1112 Davidson Road, Nashville, Tenn. 37205

BOILERS—Tube Cleaning

Combustion Engineering, Inc., Windsor, Connecticut 06095

BRAKES

Goodyear Aerospace (Industrial Brakes Division), Box 477, Berea, KY 40403

BROKERS

Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, La. 70153
Crown Assets Disposal Corp., 300 Notre Dame St., Ville St.-Pierre, Quebec, Canada H8R 3Z6
Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y., N.Y. 10006
Max Rouse & Sons, Inc., P.O. Box 5250, Beverly Hills, CA 90213

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Belcher Company of New York, Inc., 48-02 54th Avenue, Maspeth, NY 11378
Gulf Oil Trading Co., 1290 Ave. of the Americas, N.Y., N.Y. 10019

CARGO TRANSFER & ACCESS EQUIPMENT

MacGregor-Comarain, Inc., 135 Dermody St., Cranford, N.J. 07016

CHECKING SYSTEMS

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

CLOCKS

Wempe Chronometerwerke Germany, Stubbenhuk 25 2000 Hamburg 11, Germany

COILS—Cooling, Heating, Ventilating

Colmac Coil, Inc., Colville, Wash. 99114

CONTAINERS—Cargo Container Handling

Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501

CONTROL SYSTEMS—Monitoring

Arnesen Marine Systems, Inc., One Battery Plaza, New York, NY 10004
Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913
Megastystems, Inc., 5909 West 130th Street, Cleveland, OH 44130
Seatronic Engineering & Mfg. Co., 1230 E. Joppa Rd., Towson, MD 21204
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.
Transamerica Delaval, Inc., Gem Sensors Div., Spring Lane, Farmington, CT 06032

COUPLINGS

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

CRANES—HOISTS—DERRICKS—WHIRLEYS

Clyde Iron, a unit of AMCA International Corp., Suite 102, 2300 West Loop South, Houston, TX 77027
M. P. Howlett, Inc., 410 32nd St., Union City, N.J. 07087
J. D. Neuhaus, Witten-Heaven, Hebezeuge, D 5810 Witten-Heaven, West Germany
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501

DECK MACHINERY—Cargo Handling Equipment

Appleton Machine Co., Marine Division, 618 S. Oneida St., Appleton, WI 54911
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134

DIESEL ACCESSORIES—CYLINDER LINERS

B & W Marine Service, One State Street Plaza, New York, N.Y. 10004
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, Massachusetts 02360
Golfen Marine Company, Inc., 162 Van Brunt Street, Brooklyn, NY 11231
Teledyne Metal Finishers, 1725 East 27th Street, Cleveland, OH 44114
Teledyne Metal Finishers, 3125 Brinkerhoff Road, Kansas City, KS 66115
Twin Disc, Incorporated, Racine, Wis. 53403

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AM Bruning, 1834 Walden Office Square, Schaumburg, IL 60196

ELECTRICAL EQUIPMENT

Argo Marine, Div. of Argo Intl., 140 Franklin St., New York, N.Y. 10013
Marine Safe Electronics of Canada Ltd., 101 Jardin Dr., Suite 24, Concord, Ontario, Canada L4K 1B6
Oceanic Electrical Mfg. Co., Inc., 159 Perry Street, N.Y. 10014
Port Electric Supply, 157 Perry Street, N.Y., N.Y. 10014
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

EQUIPMENT—Marine

ATCO Marine Corp., 603 Dean Street, Brooklyn, NY 11238
Argo Marine, Div. of Argo Intl., 140 Franklin St., New York, N.Y. 10013
Baldt, Inc., P.O. Box 350, Chester, PA 19016
Comet Marine Supply Corp., 157 Perry St., New York, N.Y. 10014
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, N.Y. 10550
J. H. Menge & Company, Inc., P. O. Box 23602, New Orleans, La.
Rockwell International, Power Tool Division, 400 N. Lexington Ave., Pittsburgh, PA 15208
Schnitzer-Levin Marine Co., 445 Littlefield Ave., So. San Francisco, CA 94080
Schwepper Beschlag GmbH, Postfach 101110, 5620 Velbert 1, West Germany
Sudoimport, 5 Kalyaevskaya, Moscow K-6, USSR
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186

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Hartzell Propeller Fan Company, 901 S. Downing Street, Piqua, OH 45356
Joy Manufacturing Co., 338 So. Broadway, New Philadelphia, Ohio 44663
Zidell Explorations, 3121 S.W. Moody St., Portland, Ore. 97201

FENDERING SYSTEMS—Dock & Vessel

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Morse Chain Company, Div. Borg Warner, So. Aurora St., Ithaca, N.Y. 14850
Seaward International, Inc., 6269 Leesburg Ave., Falls Church, Va. 22044

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Continental Illinois National Bank, 231 S. LaSalle, Chicago, IL 60693
General Electric Credit Corp., P.O. Box 8300, Stamford, Conn. 06904
Greyhound Leasing & Financial Co., Greyhound Tower, Phoenix, AZ 85077
Kidder, Peabody & Co., Inc., 10 Hanover Square, New York, N.Y. 10005
Salomon Brothers, One New York Plaza, New York, N.Y. 10004
Warburg Paribas Becker, Inc., 2 First National Plaza, Chicago, Ill. 60670

FITTINGS & HARDWARE

Custom Alloy, 2040 N. Loop W., Houston, TX 77018
Rabvon Backing Ring Co., 675 Garden St., Elizabeth, N.J. 07207

FURNITURE

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IDT Corp. (Intersystems Design & Technology Corp.), P.O. Box 1590, Summerville, S.C. 29483

GANGWAYS

Rampmaster Inc., 1226 N.W. 23rd Ave., Fort Lauderdale, Fla. 33311

HATCH & DECK COVERS—Chain Pipe

Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07207
Lockstad Company, Inc., R D 2 Burnett Road, Mendham, NJ 07945
MacGregor-Comarain, Inc., 135 Dermody St., Cranford, N.J. 07016
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696
Julius Mock & Sons, Inc., 20 Vesey St., New York, NY 10017

HULL CLEANING

Butterworth Systems Inc., 224 Park Ave., Florham Park, N.J. 07932
Phosmarin Equipment (Phocenne Sous-Marine S.A.), 21 Boulevard de Paris, 13002 Marseille, France
Sub Enterprises, Inc., P.O. Box 16531, Irvine, CA 92713

HYDRAULICS

Voss, Inc., Building J, 7029 Huntley Road, Columbus, Ohio 43229

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Camar Corporation, P.O. Box 460, Worcester, MA 01613
Foster Wheeler Boiler Corp., 110 So. Orange Ave., Livingston, N.J. 07039
Fredriksstad mek. Verksted, N. American Agents, American United Marine Corp., 575 Madison Ave., New York, N.Y. 10022

INFORMATION—Marine

Maritime Data Network, 300 Broad Street, Stamford, CT 06901

INSULATION—Cloth, Fiberglass

Bailey Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
Dupont Company, Nemours Bldg.-RM C31H6, Centre Rd. Bldg., Wilmington, DE 19898
IDT Corp. (Intersystems Design & Technology Corp.), P.O. Box 1590, Summerville, S.C. 29483

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Alexander & Alexander, Inc., 1185 Ave. of the Americas, New York, N.Y. 10036
Midland Insurance Co., 160 Water St., New York, N.Y. 10038
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Masonite Commercial Division, Dover, OH 44622
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Duo-Safety Ladder Co., 513 West 9th Ave., P.O. Box 497, Oshkosh, Wis. 54901

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ACR Electronics, Inc., 10-99 3901 North 29th Avenue, Hollywood, FL 33020
Oceanic Electrical Mfg. Co., 157 Perry Street, New York, N.Y. 10014
Oreck Corp., 100 Plantation Rd., New Orleans, LA 70123
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Phoenix Products Company, 4785 North 27th Street, Milwaukee, WI 53209
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Master Machine Tools, Inc., 1300 East Avenue A, Hutchinson, Kansas 67501
Republic-Lagun Machine Tool Co., 1000 E. Carson St., Carson, CA 90749

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General Electric Company—Bldg. 2, Rm 216, Schenectady, N.Y. 12345
Schnitzer-Levin Marine Co., 445 Littlefield Ave., So. San Francisco, CA 94080

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Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
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C.D.I. Marine Co., Regency East, Suite 222, 9951 Atlantic Blvd., Jacksonville, Florida 32211
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Nicum & Spaulding Associates, Inc., 911 Western Ave., Seattle, WA 98104

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Norgaard and Clark, 114 Sansome St., San Francisco, CA 94104

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PRC Guralnick, 5252 Balboa Ave., San Diego, CA 92117

Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156

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M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013

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Sargent & Herkes, Inc., 611 Gravier St., New Orleans, La. 70130

Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Florida 33316

Seacor Systems Engineering Associates, Corp., P.O. Box 2030, 19 Cherry Hill Industrial Park, Perina Blvd., Cherry Hill, NJ 08003

Seaworthy Engine Systems, 36 Main Street, Essex, CT 06426

George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007

T. W. Spaetgens, 156 West 8th Ave., Vancouver, Canada V5Y 1N2

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Richard R. Taubler Inc., 8 Columbia St., Millford, Del. 19963

Thames Engineering Consultants Inc., P.O. Box 589, New London, Ct. 06320

Timco, 622 Azalea Road, Mobile, AL 36609

Corning Townsend III, 18 Church St., Georgetown, CT 06829

Undersea Systems, 112 W. Main St., Bay Shore, N.Y. 11706

Wesley D. Wheeler Associates, Ltd., 104 East 40 St., Suite 207, New York, N.Y. 10016

Thomas B. Wilson, 920 North Avalon Blvd., Wilmington, CA 90744

XPLO Corporation, 229 Fifth Street, Gretna, LA 70053

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Comsat General Corp., 950 L'Enfant Plaza, S.W., Washington, D.C. 20024

Dantronics Co., P. O. Box 673, Rye, NY 10580

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EPSCO, Inc., 411 Providence Highway, Westwood, Mass. 02090

Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080

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Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913

Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631

ITT Decca Marine, U.S. Route I & St. Joe Rd., P.O. Box G, Palm Coast, FL 32037

ITT Mackay Marine, 2912 Wake Forest Road, Raleigh, N.C. 27611

Intermarine Electronics, Inc., Flowerfield Bldg. #7, St. James, N.Y. 11780

Iatron Corp., 5 Alfred Circle, Bedford, MA 01730

Krupp Atlas-Elektronik, 241 Erie Street, Jersey City, NJ 07302

Maritel, Inc., 139 Old Solomon's Island Road, Annapolis, MD 21401

Nav-Com, Inc., 711 Grand Blvd., Deer Park, NY 11729

Navidyne Corp., 11824 Fishing Point Drive, Newport News, VA 23605

Navigation Communications Systems, Inc., 20100 Plummer Street, Chatsworth, CA 91311

North American Philips Communication Corp., 91 Mckee Road, Mahwah, N.J. 07430

RCA Service Co., Building 204-2, Camden, N.J. 08101

Radar Devices, Inc., 2955 Merced Street, San Leandro, CA 94577

Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
Rockwell International, Collins Telecommunications Products Division, Cedar Rapids, IA 52406
Simrad Inc., 1 Labriola Court, Armonk, N.Y. 10504
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.
Texas Instruments Inc., P.O. Box 226080, M/S 3107, Dallas, TX 75265
Tracor, Inc., Industrial Products Div., 6500 Tracor Lane, Austin, Texas 78721

OILS—Marine—Additives

B. P. Marine North America Trading, Plaza 9, 900 Route 9, Woodbridge, NJ 07095
Ferro Corporation, P.O. Box 1764, Bellevue, WA 98009
Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001
Gulf Oil Trading Co., 1290 Ave. of Americas, New York, N.Y. 10019
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002
Mobil Oil Corporation, 150 East 42nd St., New York, N.Y. 10017
Texaco, Inc. (International Marine), 135 East 42nd St., N.Y., N.Y. 10017

OIL/WATER SEPARATORS

Alfa-Laval, Inc., 2115 Lindwood Avenue, Ft. Lee, NJ 07024
Butterworth Systems Inc., 224 Park Ave., Florham Park, N.J. 07932

PAINTS—COATINGS—CORROSION CONTROL

Belzona Molecular Metalife Inc., 224 7th Street, Garden City, NY 11530
"CONSOL" manufactured by Hanline Bros., Inc., 1400 Warner St., Baltimore, MD 21230
Devoe Marine Coatings Co., P.O. Box 7600 Louisville, KY 40207
Eureka Chemical Company, 234 Lawrence Ave., So. San Francisco, CA 94080
International Paint Co., 17 Battery Place North, Suite 1150, New York, N.Y. 10004
Mobil Chemical Co., Maintenance & Marine Coatings Dept., P.O. Box 250, Edison, N.J. 08817
The Skybrite Co., 3125 Perkins Ave., Cleveland, OH 44114

PETROLEUM SUPPLIES

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

PIPE—HOSE—Cargo Transfer, Clamps, Couplings

Camlock Flange Sales Corp., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696
CUNICO Corp., Cooney Pipe & Copper Works Div., 214 N. Hawaiian Ave., Wilmington, CA 90748
Hydro-Craft, Inc., 4223 Edgeland, Royal Oak, Mich. 48073
Kubota, Ltd., 22, Funade-cho 2-chome, Naniwa-Ku, Osaka, Japan
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

PLASTICS—Marine Applications

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

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

Alco Power Inc., 100 Orchard St., Auburn, N.Y. 13021
Alsthom-Atlantique, 2 quai de Seine, 93203 Saint-Denis, France
Armo Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150
Bird Johnson Company, 110 Norfolk St., Walpole, Mass. 02081
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Burmeister & Wain Diesel, Inc., 50 Broadway, New York, NY 10004
Caterpillar Tractor Company, Engine Division, Peoria, IL 61629
Colt Industries' Fairbanks Morse Engine Division, Beloit, Wisc. 53511
Combustion Engineering, Inc., Windsor, Connecticut 06095
Electro-Motive Division, General Motors Corp., LaGrange, Ill. 60525
Elliott Company, (Div. of Carrier Corp.), Jeanette, PA 15644
General Electric Co., Diesel Power Products, 2901 E. Lake Rd., Erie, PA 16531
MTU of North America, Inc., 10450 Corporate Drive, Sugar Land, TX 77478
Maritime Industries, Ltd., 6307 Laurel St., Burnaby, B.C. Canada V5B 3B3
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
Motive Power Corp., P.O. Box 365, Mineola, NY 11501 70124
Omnithruster Inc., 15418 Cornet Ave., Santa Fe Springs, CA 90670
Oosterhuis Industries, P.O. Box 30587, New Orleans, LA 70190
Port Electric Turbine Div., 155-157 Perry St., New York, N.Y. 10014
Propulsion Systems Inc., 21213 76th Ave., So., Kent, WA 98031
Schottel of America, Inc., 8375 N.W. 56 Street, Miami, Fla. 33166
Skinner Engine Company, P.O. Box 1149, Erie, PA 16512
Tacoma Boatbuilding Co./Escher Wyss, 1840 Marine View Dr., Tacoma, WA 98422
Transamerica DeLaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621
Transamerica Delaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, N.J. 08650
Turbine Specialties, Inc., P. O. Box 207, West State Street Road, Salina, KS 67401
Voith Schneider of America—U.S. Agent: Eli Sharprut, 347 Evelyn St., Paramis, N.J. 07652

PUMPS—Repairs—Drives

Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030
Transamerica DeLaval, Inc., IMO Pump Div., P.O. Box 321, Trenton, NJ 08602
Warren Pumps, Inc., Bridges Ave., Warren, Mass. 01083

REFRIGERATION—Refrigerant Valves

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

ROPE—Manila—Nylon—Hawsers—Fibers

American Mfg. Co., Inc., Willow Avenue, Honesdale, Pa. 18431
Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110
Tubbs Cordage Company, Orange, CA 92668

RUDDER ANGLE INDICATORS

Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

SANITATION DEVICES—Pollution Control

Argo Marine Pollution Systems Division, 140 Franklin St., New York, N.Y. 10013
Envirovac (Division of Dometic Inc.), 1260 Turret Drive, Rockford, IL 61111
Marine Moisture Control Co., Inc., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696
Marland Environmental Systems, Inc., N. Main Street, Walworth, WI 53184
Microphor, Inc., P.O. Box 490, Willits, CA 95490
Red Fox Industries, P.O. Drawer 640, New Iberia, LA 70560
Research Products/Blankenship, 2639 Andjon, Dallas, Texas 75220
St. Louis Ship FAST Sewage Systems, 611 East Marceau St., St. Louis, Mo. 63111
Sigma Treatment Systems, 2 Davis Ave., Frazer, PA 19355

SCAFFOLDING EQUIPMENT—Work Platforms

Patent Scaffolding Co., 2125 Center Ave., Fort Lee, N.J. 07024
Spider Staging Sales Co., P.O. Box 182, Renton, Washington 98055
Trus Joist Corp., P.O. Box 60, Boise, Idaho 83707

SHAFT SEALS, REVOLUTION INDICATOR EQUIPMENT

Bird-Johnson Co., 100 Norfolk St., Walpole, MA 02081
Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

SHIPBREAKING—Salvage

American Ship Dismantlers, Inc., Division of Schnitzer Industries, 3300 N.W. Yeon Avenue, Portland, Ore. 97210
The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202
Levin Metals Corporation, 1310 Canal Blvd., Richmond, CA 94807
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

SHIPBUILDING STEEL

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

SHIPBUILDING—Repairs, Maintenance, Drydocking

A.D.M. (Amsterdam Drydock Mfg.), Moatschappij bv, P.O. Box 3006, 1003 AA, Amsterdam, Holland
AMT, Inc., 2400 N.W. 39th Avenue, Miami, FL 33142
Asmar Shipyards Co., Astilleros y Maestranzas de la Armada, Prat 856, Piso 14, Casilla 150-V, Valparaiso, Chile, S.A.
Astilleros Espanoles S.A., 17 Padilla, P.O. Box 815, Madrid, Spain
Astilleros Unidos de Veracruz, S.A., San Juan de Uluva S/N, Apdo. Postal 647, Veracruz, Ver., Mexico
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150
Bergeon Industries Inc., P.O. Box 38, St. Bernard, La. 70085
Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004
Blount Marine Corp., P.O. Box 368, Warren, RI 02885
Boeing Marine Systems, P.O. Box 3707, Mail Stop 14-11, Seattle, WA 98124
Ira S. Bushey & Sons, Inc., 764 Court Street, Brooklyn, N.Y. 11231
Cantieri Navali Riuniti, Via Cipro, 11, 16100 Genova, Italy
Carrington Slipways Pty, Ltd., Old Punt Road, Tomago, N.S.W., Australia 2322
Centromar, One World Trade Center, Suite 3557, New York, N.Y. 10048
China Shipbuilding Corp., c/o Allegro Transportation Supply Co., One Penn Plaza, Room 1606, New York, NY 10119
Coastal Dry Dock & Repair Co., Building 131, Brooklyn Navy Yard, Brooklyn, N.Y. 11205
Conrad Industries, P.O. Box 790, Morgan City, La. 70380
Curacao Drydock Co., Inc., P.O. Box 153, Willemstad, Curacao, Netherlands Antilles
Curacao Drydock, 26 Broadway, Suite 741, New York, N.Y. 10004
Delattre-Levivier, Tour Fiat, Cedex 16, 92084 Paris La Defense, France
Dorbyl Ltd., Military Road, 1 Industrial Sites, West Bank, 5201 East London Republic of South Africa
Dravo Steelship Corp., R.4, Box 167, Pine Bluff, Ark. 71602
Empresa Nacional Bazan, Paseo de la Castellana 65, Madrid 1 Spain
Equitable Shipyards, Inc., P.O. Box 8001, New Orleans, La. 70122
FMC Corp., Marine & Rail Equipment Div., 4700 N.W. Front Ave., Portland, Oregon 97208
Galveston Shipbuilding Co., P.O. Drawer 2660, Galveston, TX 77553
HBC Barge, Inc., Grant Building, Pittsburgh, PA 15219
Halifax Industries, Ltd., P.O. Box 1477, Halifax, Nova Scotia, Canada, B3K 5H7
Halter Marine, Inc., P.O. Box 29266, New Orleans, La. 70189
Havre de Grace, Havre de Grace, Md.
Hitachi Shipbuilding & Engrg. Co., Ltd., 47 Edobori 1-Chome, Nishi-Ku, Osaka, Japan
Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong
Hudson Shipyards, Inc., P.O. Box Q, Pascagoula, MS 39567
Jackson/New York, 29 45 Richmond Terrace, Staten Island, NY 10303
Jeffboat, Inc., Jeffersonville, Ind. 47130
Keppel Shipyard Ltd., P.O. Box 2169, 325, Telok Blangah Road, Singapore 4
Kockums Shipyard, S-201, 10 Malmo 1, Sweden
Levingston Shipbuilding, P.O. Box 968, Orange, TX 77630
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134
McDermott Incorporated, 1010 Common Street, New Orleans, LA 70160
MacGregor Land & Sea, Inc., 135 Dermody Street, Cranford, NJ 07016
Mangone Shipbuilding Co., 819 South 80th Street, P.O. Box 5446, Houston, TX 77012
Matton Shipyard Co., Inc., P.O. Box 645, Cohoes, New York 12047
Misener Industries, Inc., 5353 Tyson Avenue, P.O. Box 13625, Tampa, Fla. 33681
Mississippi Marine Towboat Corp., P.O. Box 539, Harbor Front Industrial Park, Greenville, MS 38701
Monark Boat Co., P.O. Box 210, Monticello, Ark. 71655
Nashville Bridge Company, P.O. Box 239, Nashville, TN 37202
National Steel & Shipbuilding Corp., San Diego, Calif. 92112
Newpark Shipbuilding & Repair, P.O. Box 5426, Houston, TX 77012
Newport News Shipbuilding & Dry Dock Co., 4101 Washington Ave., Newport News, Va. 23607
North American Hydraulics, P.O. Box 278, Brampton, Ontario Canada L6V 2L1
O.A.R.N. (Officine Allestimento-Riprazioni Navi), P.O. Box 1395, Genoa, Italy 16100
Pacoco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501
Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, Fla. 33156
Perth Amboy Dry Dock Co., Perth Amboy, N.J. 08862
Port Allen Marine Service, Inc., P.O. Box 108, Port Allen, LA 70767
Port Houston Marine, Inc., 7220 J.W. Peavy Drive, Houston, TX 77012
Port of Portland, P.O. Box 3529, Portland, OR 97208
Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22
S.E.B.N., Societa Estercizio Bacini Napoletani, Via Marinella Varco N.6 (80133) Naples, Italy

St. Louis Shipbuilding—Federal Barge, Inc., 611 East Marceau, St. Louis, Mo. 63111
STE Marie Yard & Marine, Inc., 741 East Portage Ave., Sault Ste Marie, MI 49783
Savannah Shipyard Co., P.O. Box 787, Savannah, GA 31402
Sembawang Shipyard Ltd., Sembawang, P.O. Box 3, Singapore 9175

The Service Machine Group, Inc., P.O. Box 2664, Morgan City, LA 70308
Setenave-Estaleiros Navais De Setubal, P.O. Box 135, Setubal, Portugal
Southwest Marine, Inc., P.O. Box 13308, San Diego, Ca 92113
Sudimport, 5 Kalyaevskaya, Moscow K-6, USSR
Swiftships Inc., P.O. Box 1908, Morgan City, LA 70380
Tacoma Boatbuilding Co., Inc., 1840 Marine View Drive, Tacoma, WA 98422

Todd Shipyards Corp., 1 State St. Plaza, New York, N.Y. 10004
Total Transportation Systems Inc., 813 Forest Dr., Newport News, VA 23606
Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 28, N5201 Oslo, Norway
Tracor Marine, P.O. Box 13107, Port Everglades, Fla. 33316
Tug Barge Systems, Inc., subsidiary of Ingram Corp., 4100 One Shell Square, New Orleans, La. 70139
Union Dry Dock & Repair Co., Foot of Pershing Road, Weehawken, N.J. 07087
Wiley Manufacturing, a unit of AMCA International Corp., P.O. Box 97, Port Deposit, MD 21904
Zigler Shipyards, P.O. Box 2607, Morgan City, La. 70380

SHIP STABILIZERS
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

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

STUFFING BOXES
Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062

SURVEYORS AND CONSULTANTS
Francis B. Crocco, Inc., P.O. Box 1411, San Juan, Puerto Rico 00903
Hull & Cargo Surveyors, Inc., 99 John St., New York, NY 10038

TANK CLEANING
Butterworth Systems Inc., 224 Park Ave., P.O. Box 352, Florham Park, N.J. 07932
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030
Salwico, Inc., 77 River St., Hoboken, N.J. 07030

TANK LEVELING INDICATORS
Transamerica Delaval, Inc., Gem Sensors Div., Spring Lane, Farmington, CT 06032
Vu-Gage System, 150 E. 42nd St. (Room 910), New York, NY 10017
Zesco, Inc., 3131 Brian Park, Suite 1095, Houston, TX 77042

TECHNICAL MANUAL PREPARATION
Benhof, Inc., 2468 N. Jerusalem Road, N. Bellmore, NY 11710

TERMINALS—Oil-Transfer
Caicos Petroleum Services Div., Federal Chicago Corp., 2222 North Elston Avenue, Chicago, IL 60614
Delong Corp., 29 Broadway, New York, N.Y. 10006
Houston Marine Services, Inc., First State Tower, (Suite 509), Houston, TX 77015
Transportation Concepts & Techniques Inc., 1020 West Main Street, Charlottesville, VA 22903

TOWING—Barges, Vessel Chartering, Lighterage, Salvage, etc.
Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002
Chotin Transportation, Inc., 580 Walnut St., Cincinnati, Ohio 45202
Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md. 21202
Henry Gillen's Sons Lighterage, 21 West Main St., Oyster Bay, N.Y. 11771
Gulf Fleet Marine Corporation, Canal Place One, Suite 2400, New Orleans, LA 70130
James Hughes, Inc., 17 Battery Pl., New York, N.Y. 10004
McAllister Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
McDonough Marine Service, P.O. Box 26206, New Orleans, La.
Moran Towing & Transportation Co., Inc., One World Trade Center, Suite 5335, New York, N.Y. 10048
Suderman & Young Co., Inc., 918 World Trade Bldg., Houston, Texas 77002
Turecamo Coastal & Harbor Towing Corp., One Edgewater St., Clifton, Staten Island, N.Y. 10305

UNDERWATER SERVICES—Contracting
SeaTec International Ltd., Blackburn Industrial Center, Gloucester, MA 01930

VALVES AND FITTINGS
Dover Corporation, Norris Division, P.O. Box 1739, Tulsa, OK 74101
Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07207
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696
Marland Environmental Systems Inc., N. Main St., Walworth, WI 53184
Rockwell International, Flow Control Division, 400 N. Lexington Avenue, Pittsburgh, PA 15208
Stacey Valve Co., 29 Meserole Ave., Brooklyn, N.Y. 11222
Voss, Inc., Building J, 7029 Huntley Road, Columbus, Ohio 43229
Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186

WINCHES AND FAIRLEADERS
Bloom Inc., Highway 20, West Four Miles, Independence, IA 50644
Clyde Iron, a unit of AMCA International Corp., Suite 102, 2300 West Loop South, Houston, TX 77027
Gearmatic Co. Ltd., 7400 132nd Street, Surrey, B.C., Canada
Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134
Smith-Berger Manufacturing Corporation, 3236 16th Avenue S.W., Seattle, WA 98134

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

WIRE AND CABLE
Anixter Bros., Inc., 4711 Golf Road, One Concourse Plaza, Skokie, Illinois 60076
Seacoast Electric Supply Corp., 225 Passaic St., Passaic, NJ 07055
Seacoast Electric Supply Corp., 1505 Oliver St., Houston, TX 77007

WIRE ROPE—Slings
Armo Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004

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

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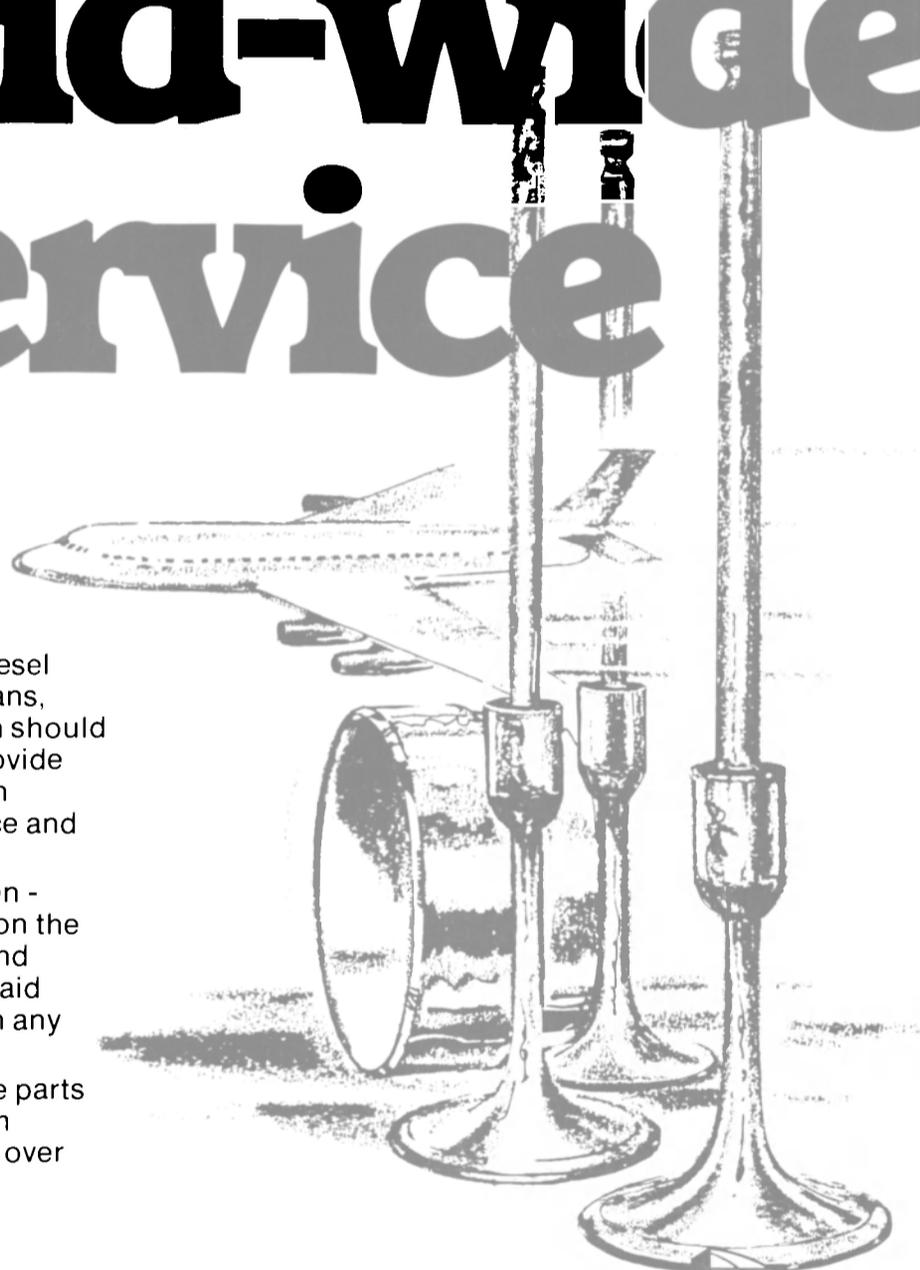
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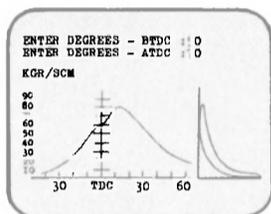
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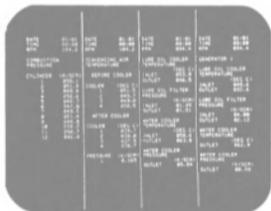
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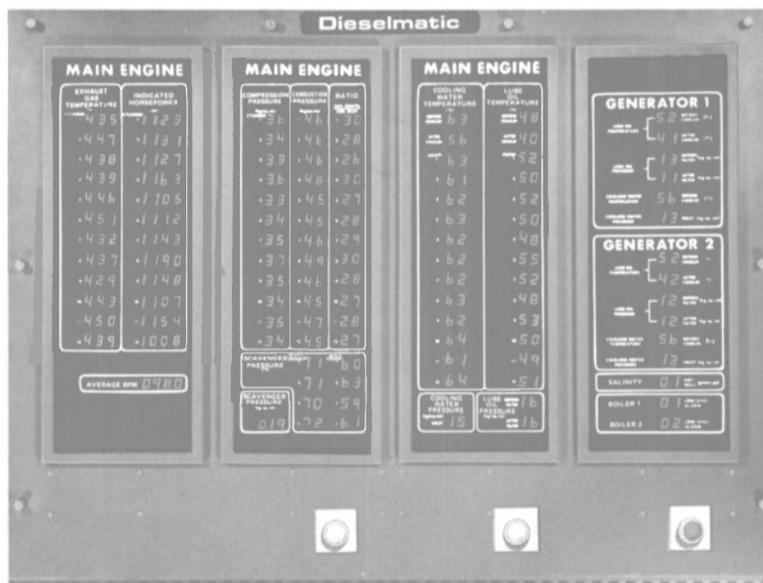
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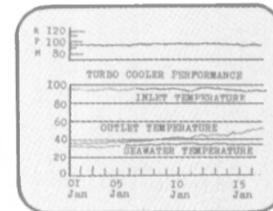
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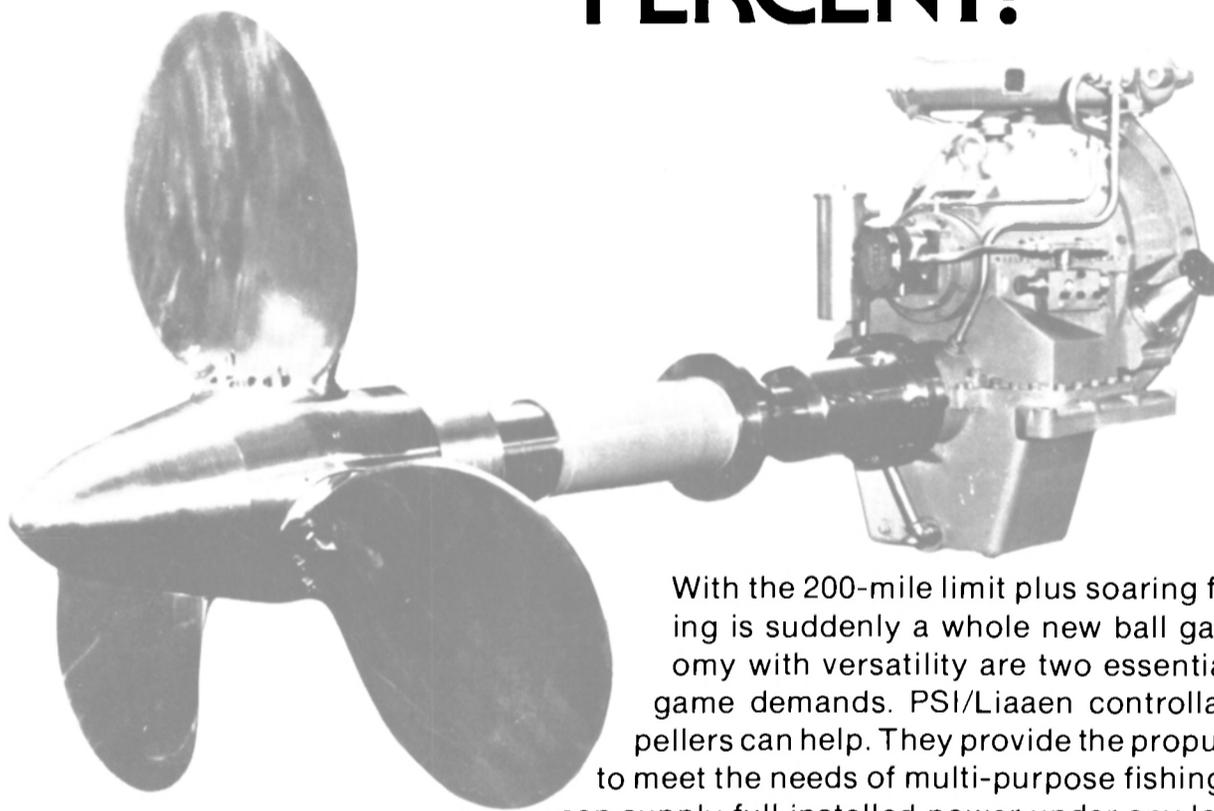
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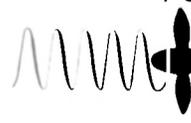
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