MARITIME
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AND
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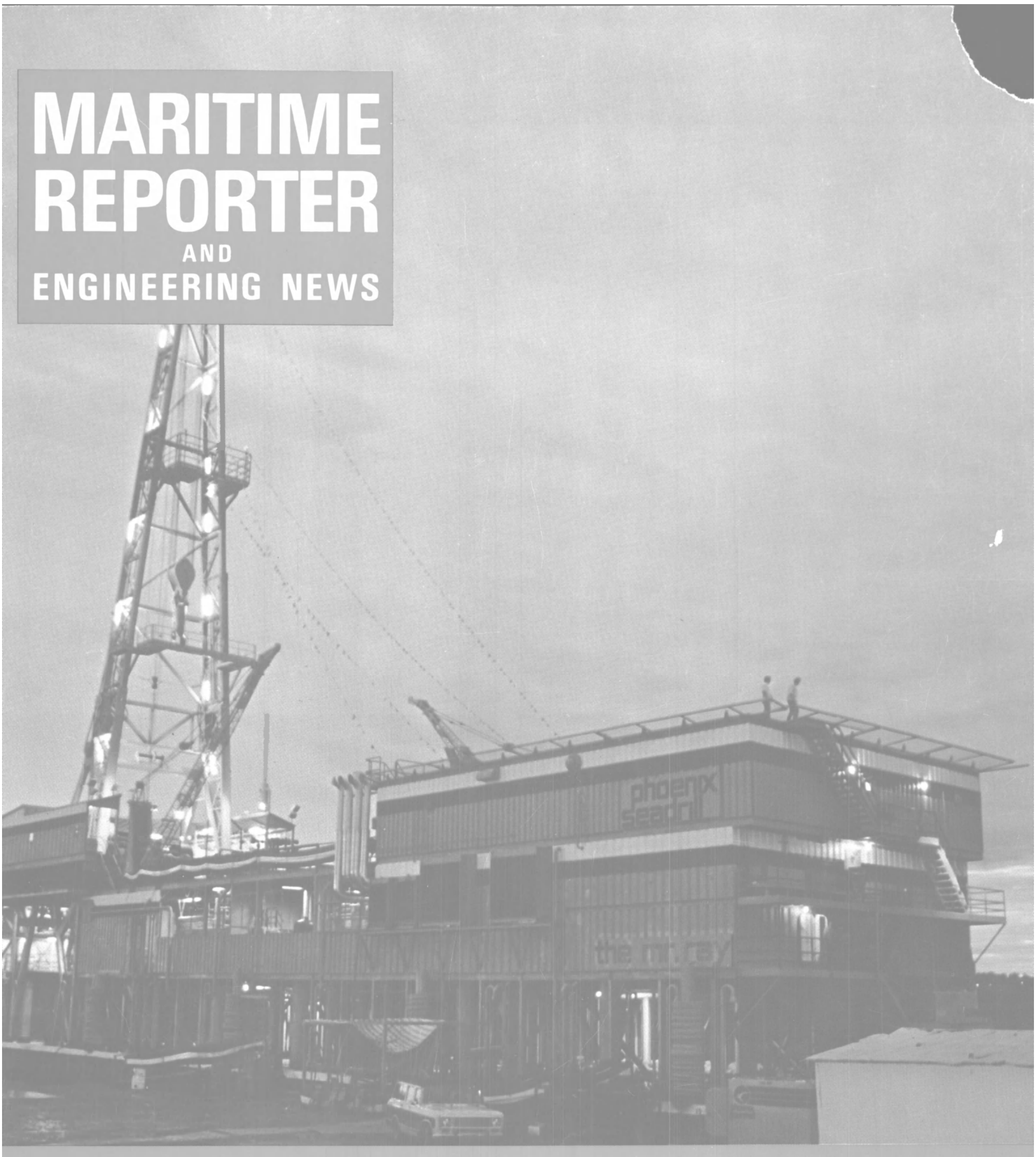


'The Mr. Ray'

Submersible Drilling Barge Christened At McDermott Yard

(SEE PAGE 4)

DIESEL POWER REVIEW

(SEE PAGE 4)

OCTOBER 15, 1981

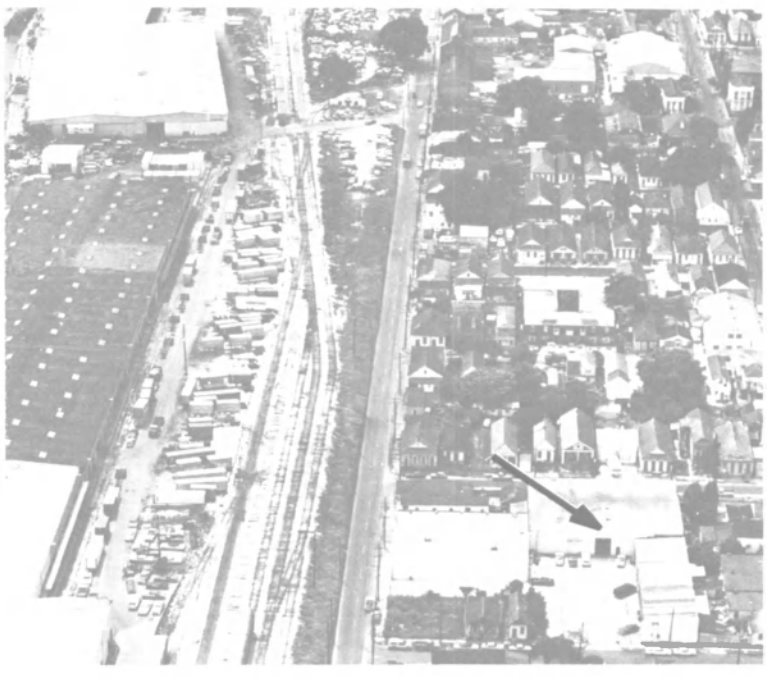
BAILEY'S EXPANDING

More than 30 years marine experience has taught us an important lesson: when our customer's ship hits port with a problem, we have to be ready "right now."

The best way to provide this service is to have all the necessary material on *our* shelves, not at some manufacturer's plant half way across the country. And to make sure that our shelves are where you need them. All of which is why we are expanding our main office and all branch facilities.

In our Brooklyn, New York, main office we have just completed a 10,500 square foot expansion and are about to add another 6,000 square feet to the existing 31,000 square feet. We have expanded our home office truck fleet as well to more comprehensively service the port of New York.

In our New Orleans office, an additional 12,000 square feet have been added to the existing 27,250 square feet. And this entire complex is just across the street from the docks.



And in New Jersey, our existing 25,000 square foot facility can easily be tripled in capacity whenever required.

Also, we have just doubled available space in our Miami plant to better serve Florida's booming cruise ship traffic.

But it takes much more than floor space to provide Bailey service. We carry an enormous parts and equipment inventory valued at over $2,500,000 to insure that we can deliver exactly what you need exactly when you need it. Plus, Bailey's engineering and technical staff is unmatched in the marine business.

When you need service, you need Bailey. Call us.

Bailey Refrigeration Co., Inc.

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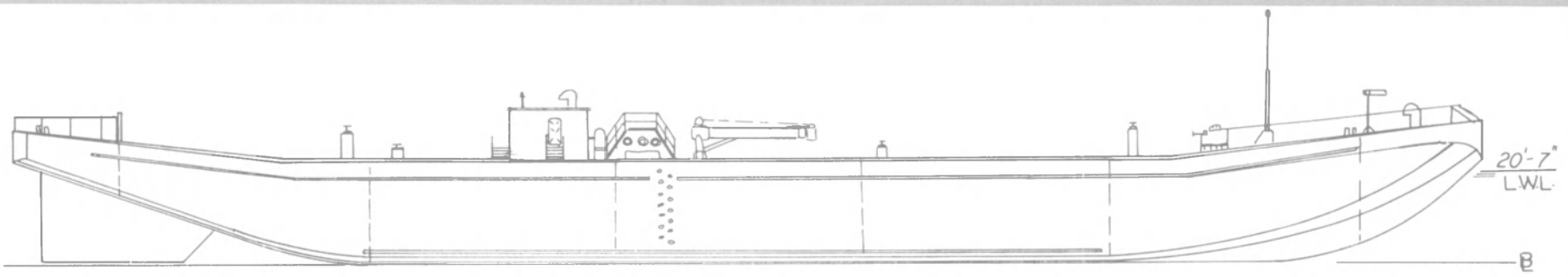
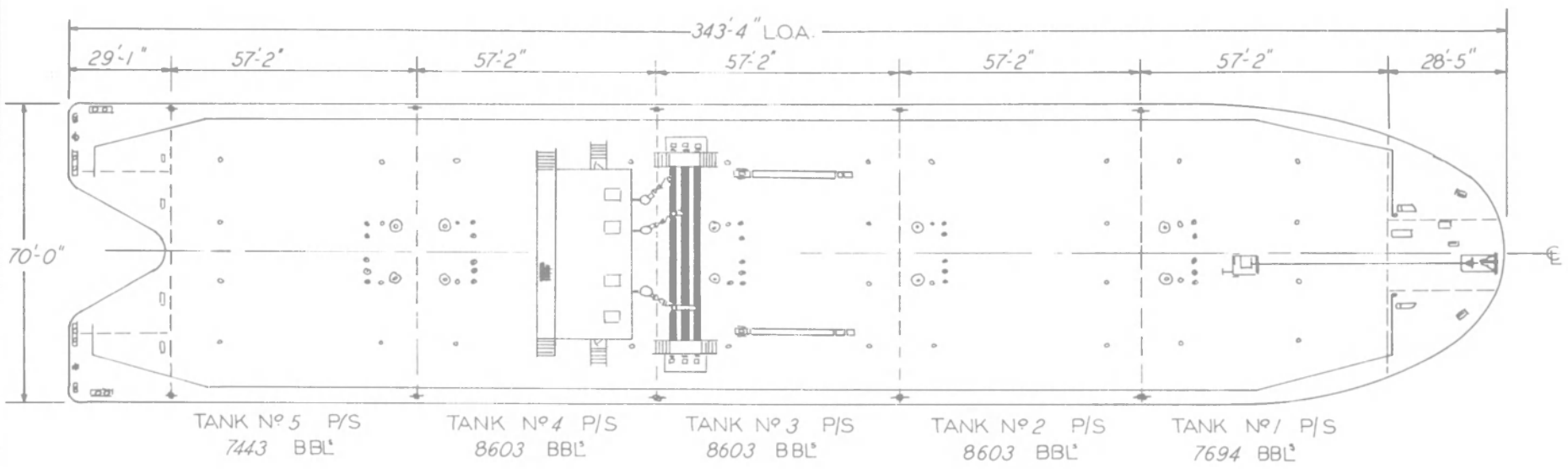
New 80,000 Barrel Barge Available for Oil and Chemical Transportation



OUTBOARD PROFILE



PLAN VIEW - MAIN DK. ARRNG'T.

This new barge, McAllister 80, is available for freightment or charter.

- **Suitable for clean petroleum products and chemicals. Tanks fully coated with inorganic zinc.**
- **Capable of loading or discharging 3 cargoes simultaneously.**
- **Able to handle 10 segregations.**

Call John Alban, General Manager, Oil Transportation Division at (212) 269-3200 or any of the McAllister offices listed below.

McALLISTER 80 CHARACTERISTICS

	VESSEL PARTICULARS	
1.	LENGTH, O.A.	343'-4"
2.	BREADTH	70'-0"
3.	DEPTH	24'-7"
4.	LOADLINE DRAFT	20'-7"
5.	DEADWT @ 20'-7"	9546 L.T.
6.	A.B.S. ✠ A-1 OIL BARGE OFFSHORE	
7.	TOTAL CAPACITY @ 100% FULL	81892 BBLS

	MACHINERY PARTICULARS
1.	ENGINES: (3) GM DIESELS 12V-71
2.	PUMPS: (3) GOULDS 16x12-3500 GPM
3.	GENERATOR: (1) G.M. 2-71 W/ 30 K.W. 230/115 VAC. 3 PHASE

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McAllister

Write 243 on Reader Service Card

ON THE COVER

$16-Million Title XI MarAd Guarantee Approved For Dry Cargo Barge

Acting Maritime Administrator **Bruce McAllister** recently approved in principle an application from Universal American Barge Corp., Greenwich, Conn., for a Title XI guarantee to aid in financing a 33,000-dwt dry cargo barge. The vessel was built by Bay Shipbuilding Corp., Sturgeon Bay, Wis., and delivered last month.

The applicant, a subsidiary of Universal American Shipping Co., indicated the barge will be used for domestic coal shipments. The approved guarantee is for $16,047,000, or up to 87.5 percent of the barge's estimated depreciated actual cost of $18,339,638.

Award $2.3-Million Navy Contract To CDI Marine

CDI Marine Company, Jacksonville, Fla., recently announced the award of a major contract with Boland Marine and Manufacturing Company, New Orleans, La. CDI Marine Company is to furnish engineering and design services for the conversion of a C3-S-33a Design Ship to a Fleet Ballistic Missile Resupply Ship (T-AK-5) (FMB). The $2.3-million contract was a result of CDI Marine Company's proven ability to provide engineering services for major conversions and overhauls within a short period of time. CDI Marine is one of the nation's largest naval architectural and marine engineering firms.

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Our CONTROLLABLE PITCH PROPELLERS have featured remote control systems for as long as we've been making them—over 26 years. With that much experience, we have the capability to develop flexible controls, designed to match operator needs with hull and machinery characteristics. Built under ABS survey to ACC or ACCU requirements and backed by comprehensive vibrational and operational testing.

Remote stations are drop-in panels: Pneumatic (1) or Electronic (2) to ease integration with ship control consoles. Control Transfer and Mode Selection Logic (3) is a fail safe system, with low voltage DC for back-up control. Propulsion Load Limit Logic (4) operates on a programmed power-RPM relationship. The payoff with this system—improved fuel efficiency and less engine wear.

Our patented Engine Load Sharing System (5) provides fuel rack equalization—which results in uniform load between two or more engines driving the same propeller. For FP or CP Propellers, retrofits or new construction, our service tested system compensates for calibration deviations between engine governors throughout the full range of RPM and power.

From hydrodynamic performance and CP propeller mechanical design to hydraulic amplification of remote controls, we have the experience to put you in control of your ship. Interested? Contact us for the details.

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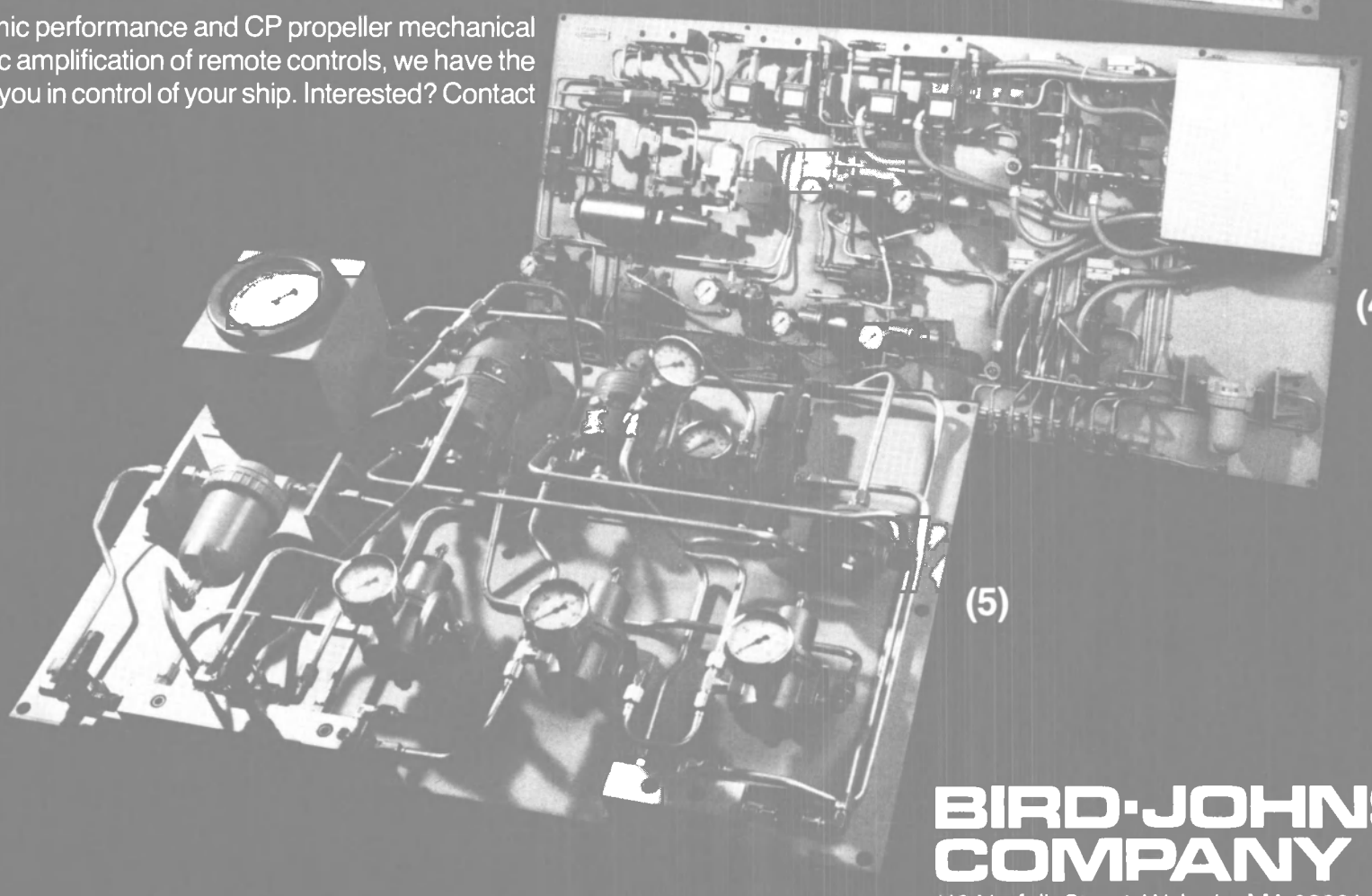
(2)

(3)



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BIRD-JOHNSON COMPANY MARINE DIVISION

110 Norfolk Street, Walpole, MA 02081, (617) 668-9610

INMARSAT Set For February 1 Start

A new, high-quality global satellite communication system for ships at sea, run by INMARSAT, will come into operation on February 1, 1982. INMARSAT is the International Maritime Satellite Organization which has 36 member-States.

A February starting date has been assured by a decision taken by the INMARSAT Council in London recently at its eighth session. The Council decided to lease capacity on two existing MARISAT satellites — one serving the Indian Ocean region, the other the Atlantic Ocean region. INMARSAT has already taken a lease on a Pacific Ocean satellite. The three satellites comprise the space segment of Comsat General's successful system.

Later next year, new satellites on which INMARSAT has leased capacity will start to replace those of the MARISAT system. The new satellites, which are needed to meet expected growth in calls, are: MARECS, maritime version of the European Communications Satellite, leased from the European Space Agency (ESA). The first MARECS will be placed in orbit over the Atlantic Ocean by the end of this year. Its launch vehicle is the European Ariane Rocket.

INTELSAT V maritime communications subsystems (MCS) leased from the International Telecommunications Satellite Organization (INTELSAT) and launched by Atlas Centaur and Ariane rockets.

Spare satellites will be provided over all three ocean regions to ensure continuity of service in the event of failure on any one satellite.

Over 700 ships throughout the world are now fitted with earth stations enabling them to send and receive calls by satellite. By the time INMARSAT takes over from the MARISAT system on February 1, 1982, the number of ship earth stations in use is expected to be nearly 1,000. Technical arrangements agreed by the INMARSAT Council and Comsat General will ensure that the transition from MARISAT to INMARSAT is accomplished without interruption to service to users and with minimum inconvenience to ship earth station manufacturers.

Brochure Available On ODECO's Range Of Services For Offshore Drilling

The Ocean Drilling & Exploration Company (ODECO), New Orleans, La., has published an eight-page full-color brochure detailing the services and equipment the 28-year-old company provides to the offshore energy industry.

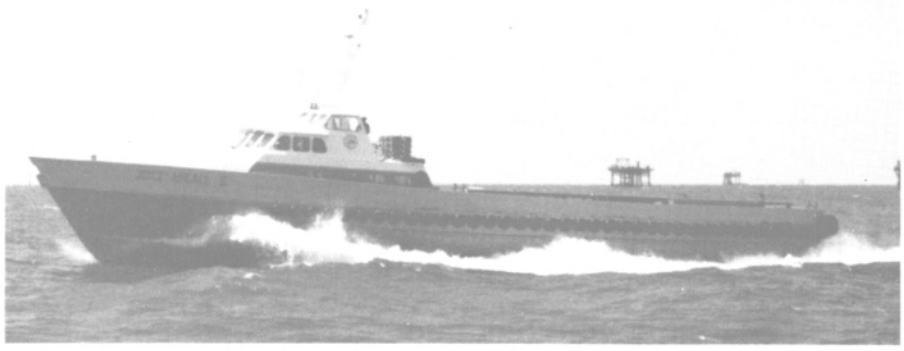
The brochure presents the company's engineering services, worldwide communications and logistical support concepts, as well as services available through related companies.

A world map pinpoints the location of 40 ODECO offshore drilling units — submersibles, semisubmersibles, jackups, and drillships—their year of build and maximum operating water depths. For a free copy of the brochure,

Write 14 on Reader Service Card

Scientific Management Awarded $3.7-Million Australian Navy Contract

Scientific Management Associates, Inc., Glouchester, N.J., has been awarded a $3,744,789 cost-plus-fixed-fee contract for technical support and modernization of the Royal Australian Navy DDG and FFG program. The Naval Sea Systems Command is the contracting activity.



Launch First Five-Screw Crewboat At Gulf Craft; Diesel Plant Modified By George Engine

George Engine Company of Harvey, La., among the world's largest distributors of marine diesel engines, has added another innovation to the offshore diesel power field. The first five-screw crew/utility boat, Joyce McCall II (shown above), was launched recently by Gulf Craft, Inc., Patterson, La.

The vessel is 125 feet long, with a breadth of 28 feet and a 12-foot height at midship; light, it draws 3½ feet.

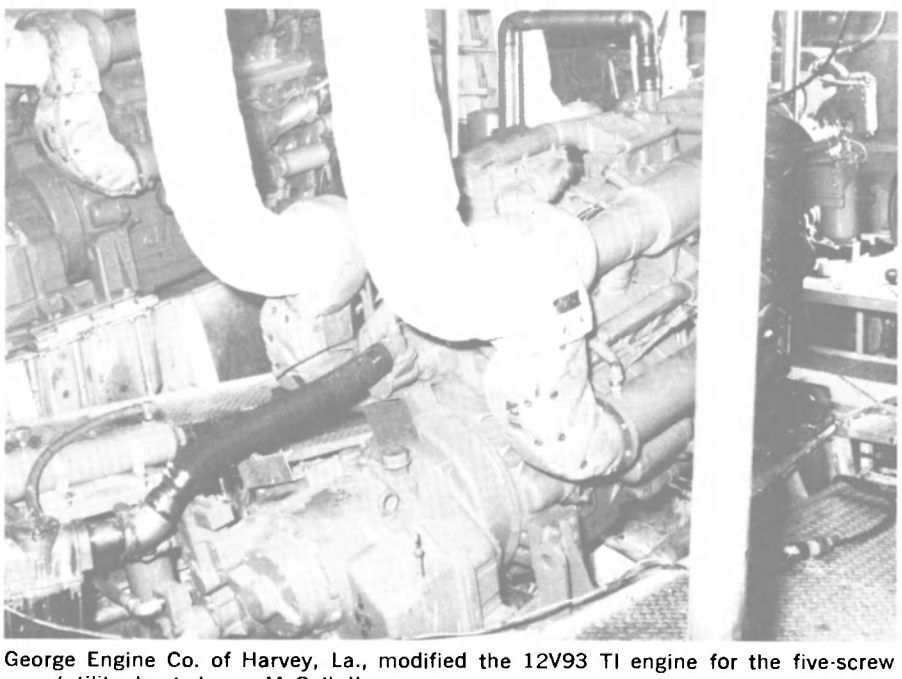
McCall Boat Rentals, which in 1975 launched the first quad-screw offshore boat, also built by Gulf Craft and powered by George, foresees several distinct advantages from the five-screw application. Owner **Norman McCall** of Cameron, La., expects better maneuverability with the vessel's three rudders, increased reliability and safety factors from the use of five engines, and an extension of his company's concept of interchangeability of engines.

The Joyce McCall II is powered by the new George Engine Company modified 12V92 TI engine, rated at 640 shaft horsepower at 2,100 rpm. George installed the intercoolers and fabricated the water-cooled rear-mounted exhaust manifolds, and relocated the turbochargers to the rear of the engine to better suit the workboat installation. George also supplied the vessel's two 3-71 30-kw generator sets and the 2:1 Twin Disc reduction gears.

This summer, McCall Boat Rentals took delivery of the quad-screw Kelly McCall from Gulf Craft, the second such installation of 12V92 TIs delivered by George.

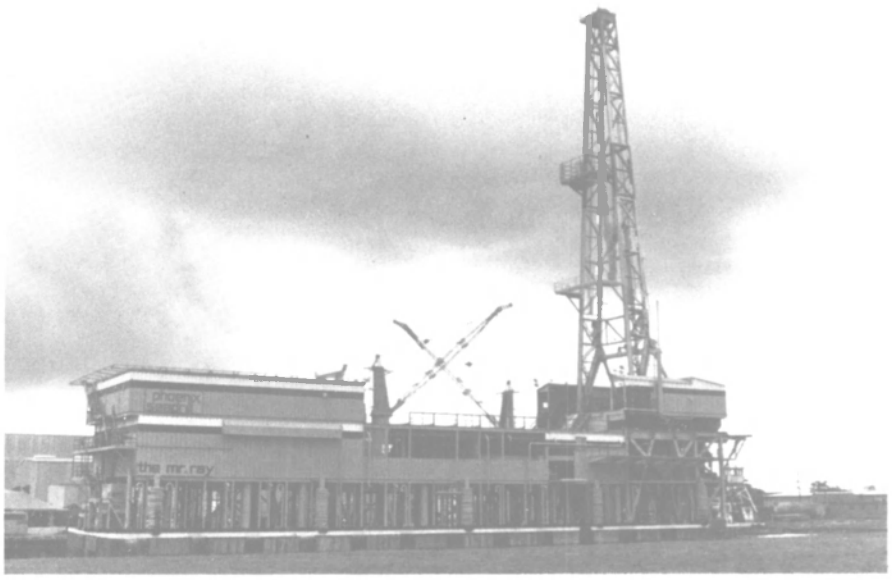
Billy Pecoraro, general manager of Gulf Craft, anticipates a loaded light speed of 25 mph at 2,100 rpm and a loaded deck tonnage of at least 150 tons. The Joyce McCall II can carry 78 passengers and has a clear deck space of 70 feet by 23 feet. It is equipped with five water tanks for a total 19,000-gallon capacity, can carry up to 8,000 gallons of fuel, and has a 6-inch fire pump powered by a Detroit Diesel 4-71 capable of pumping 1,000 gpm. The new vessel is expected to operate in the Louisiana-Texas Gulf waters with a certification of 200 miles offshore. It will be operated by a four-man crew.

McCall Boat Rentals presently operates 25 boats, powered primarily by George Engine-supplied Detroit 12V71s. McCall utilizes the same engines in 65, 77, 100, and 110-foot boats. The 12V-92 TIs are expected to be utilized in future 110-foot and larger crew/utility boats.



George Engine Co. of Harvey, La., modified the 12V93 TI engine for the five-screw crew/utility boat Joyce McCall II.

ON THE COVER



Submersible Drilling Barge 'The Mr. Ray' Christened At McDermott Yard

The Phoenix Seadrill Rig 3 — The Mr. Ray—an all-new slotted-type submersible posted drilling barge built by McDermott Inc. shipyard, New Iberia, La., was christened recently at ceremonies held at the yard.

The rig can drill below 30,000 feet in nominal 7- to 21-foot water depths. It is one of very few rigs sized for the intracoastal waterway that has the capability to drill multiple wells within its slot without repositioning the hull.

The Mr. Ray was christened by **Mrs. Ray Hargrove,** wife of the person for whom the rig is named, the late father of **William R. Hargrove,** board chairman of Phoenix Management Corp. **Frederick L. Saalwachter,** executive vice president of Phoenix, delivered the address, and the Rev. **John Mackinnon,** pastor of Memorial Drive United Methodist Church, Houston, delivered the blessing of the rig and its crews.

The Mr. Ray is a 209-foot 6-inch-long by 14-foot deep, by 54-foot wide submersible barge having a 15-foot-wide by 40-foot-long slot in the stern. The unit is equipped with a skid unit built to allow transverse and longitudinal movement of the intact mast and drill floor to as much as 4 feet off centerline port and starboard, and to as much as 8 feet fore and aft. The movement is accomplished by activation of hydraulic cylinder jacks.

Power generation for the drilling unit is from two Electro-Motive diesel Model MD16E8 marine drilling units. Each unit is rated 1,550 kw, 2,000 kva, 0.8 pf, 600 v, 3-phase, 60 hertz, with the prime mover being an EMD-16-645E8 diesel engine rated 2,200-hp maximum at 900 rpm, and the prime generator being an EMD HB20-6 brushless ac synchronous generator.

The rig has two Stewart & Stevenson Model 16VGDT-540 generator sets. The prime mover is a Detroit Diesel 16V-71T diesel engine rated 685-hp maximum at 1,800 rpm and the prime generator is a Delco brushless ac synchronous generator.

The two deck cranes are Unit Mariner 280H offshore marine pedestal cranes each ABS certified. Each crane is rated 28,620 pounds lift at 30 feet. Each is equipped with 50-foot lattice type booms with 5-foot boom tip extension. The main hoist is 10,000 pounds single line pull having a 15 ton 2 sheave main hook block. The auxiliary hoist is a 7,500-pound single line pull having a 5-ton ball with swivel and hook. Each crane is hydraulically driven. The port crane is equipped with controls on a crane pedestal. The starboard crane is equipped with remote controls located on the rig floor.

William R. Hargrove, the Phoenix Management Corporation board chairman, reports that a jackup unit, Rig No. 5, is under construction at Bethlehem Steel's Sparrows Point, Md., yard, and that three other units are in various stages of planning or design for the company.

Phoenix has purchased the equipment and entered into a contract for a Bethlehem JU-100MC. This rig will be a jackup mobile drilling unit with a cantilevered skid floor and skirted mat. It is intended to operate in the Gulf of Mexico, or in areas of similar environment, within a maximum sinking depth of 100 feet while drilling routine wells to 20,000 feet. Rig 5 is scheduled to be delivered during July 1982.

The Phoenix Seadrill Rig 4 will be capable of drilling 20,000 feet. This rig is a first of a kind utilizing a three-module hovercraft principal as a wetlands drill barge system. It has been more than 16 months in design and engineering development in the U.S. and in England by the Phoenix Hovercraft Corporation. "As soon as we are comfortable with certain patents and licenses," Mr. **Hargrove** reported, "the final design phase shall be concluded. Machinery has already been committed, and we anticipate a 12-month construction by Brown & Root." This project is very much alive and Rig 4 shall be built, Mr. **Hargrove** stated.

Herman Schellstede and Associates, Inc. is under contract to develop and engineer a submersible offshore drilling rig design for Phoenix Seadrill Rig 6. The design criteria is for Smackover and Tuscaloosa-like drilling year around in the northern coastal waters of the Gulf of Mexico. Six shipyards have been asked to bid on construction. The critical machinery has already been committed, Mr. **Hargrove** said, and Rig 6 will be scheduled for a christening the first quarter of 1983.

Phoenix Seadrill Rig 7 will be a jackup designed to stay on location in water greater than 300 feet deep during hurricane season in the Gulf of Mexico. Its drilling capabilities will be to 20,000 feet. Here, as with all of these future rigs, major equipment has already been committed, he said. Good rapport exists with a highly competent shipyard for its delivery to Phoenix in March 1983. As soon as negotiations are concluded, Mr. **Hargrove** said, details will be given and a public announcement shall be made.

The company has two jackup units operating in the Gulf of Mexico, and the Mr. Ray is under contract to Koch Exploration Co. for drilling in Louisiana waters.

Tidewater Elects Bankston President, Koock, Ramey Are New VPs

Tidewater Inc., New Orleans, La., announced the election of **Damon B. Bankston** as president and chief operating officer, and **Victor I. Koock** and **William J. Ramey** as vice presidents.

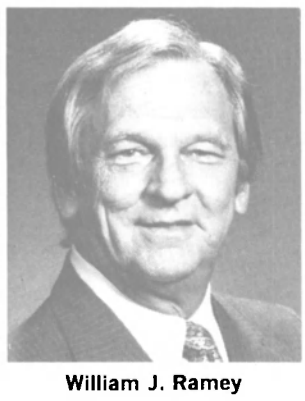
Mr. **Bankston,** former senior executive vice president and chief operating officer of Tidewater Inc., succeeds **John P. Laborde** who will remain as chairman and chief executive officer, a position he has held for the past 25 years.

A native of Dawson, Texas, and graduate of Louisiana State University, Mr. **Bankston** joined Tidewater Inc.—then named Tidewater Marine Service, Inc. — as sales manager in 1958, and in 1960 was promoted to vice president. In 1965 he was named to the company's board of directors and three years later was elected executive vice president. In 1979 he became senior executive vice president and chief operating officer.

Mr. **Bankston** is currently a director of the Employers Information Service, Inc., and is a past chairman and member of the board of directors of the Offshore Marine Association and the National Ocean Industries Association.

Damon B. Bankston

Victor I. Koock



William J. Ramey

Mr. **Koock,** vice president-legal and president of Pental Insurance Co. Ltd., the insurance subsidiary of Tidewater Inc., is in charge of the company's general legal affairs, including contract administration, admiralty, general civil law, government regulations, labor and claims.

A native of New York, N.Y., Mr. **Koock** earned a B.S. degree in biology from the University

of Alabama and a law degree from the Loyola University School of Law. He joined Tidewater in 1968 as a staff attorney.

In 1972 he was appointed manager of Tidewater's contracts department and in 1977 was elected associate general counsel. The following year he was named manager of the legal department, and two years later was elected president of Pental in addition to manager of the legal department.

He is a member of the Louisiana State Bar Association and the Maritime Law Association.

As a new vice president of Tidewater Inc., and as a vice president of Tidewater Marine Service, Inc., Mr. **Ramey** will add administrative and operational duties to his responsibilities for the marine affiliate's activities in South America and the Caribbean.

A native of Shreveport, La., and a graduate of Louisiana State University, Mr. **Ramey** joined Tidewater in 1971 as a sales representative after having served as a vice president of Homco International of Houston.

In 1973 he was appointed managing director of Tidewater Middle East Marine, Inc. in Iran, and later served as area manager in the Persian Gulf and in West Africa as regional manager, based in Nigeria.

In 1977 he was promoted a vice president of Tidewater Marine. Last year, he was named regional manager for all Latin America, excluding Lake Maracaibo.

Tidewater Inc. owns and operates the world's largest fleet of vessels serving the offshore energy industry and also explores for and produces oil and gas, and conducts air and natural gas compression operations, including engineering, fabrication, construction and operation of compressor stations and natural gas plants.

Award $5.7-Million Contract For Galveston To T.L. James Co.

T.L. James Company, Inc., Ruston, La., has been awarded a $5,739,555 firm fixed price contract for dredging Galveston Harbor following competition in which 36 bids were solicited and six were received. The Galveston Engineer District, Galveston, Texas, is the contracting activity.

Crowley Establishes Unit For Energy Transportation Headed By VP Kirkeide

Crowley Maritime Corporation (CMC), San Francisco, Calif., recently established a department identified as the energy transportation and development group, according to a recent announcement by **Leo L. Collar,** executive vice president of CMC operations.

Based in San Francisco, the new department is responsible for chartering activities of the company's fleet of large ocean-going oil barges, which includes 10 vessels of 16,000 long tons, in addition to the development of coal transportation and terminal services. The group will also pursue new energy transportation opportunities and the development of related equipment to meet market demand.

Heading the new department is **Keith L. Kirkeide,** vice president, who previously directed the company's bulk petroleum services.

John S. Hollett was named director of marketing and development for the new energy group. He was formerly director of marketing, contract transportation, for CMC's Caribbean operations in Jacksonville, Fla.

Charles D. Madison is director of bulk petroleum marketing. Mr. **Madison's** four years in management of bulk petroleum marketing at CMC were preceded by over 20 years in marine and oil industry operations.

Larry R. Olsen has been appointed director of coal transportation and development. Mr. **Olsen** was previously managing director for a CMC trucking and marine transportation subsidiary based in Damman, Saudi Arabia.

Mrs. Joseph Elected Director At Twin City Barge

Mrs. Geri M. Joseph, former U.S. Ambassador to the Netherlands, has been elected to the board of directors of Twin City Barge, Inc., St. Paul, Minn., it was announced recently by **John W. Lambert**, chairman of the board.

A life-long resident of the Twin Cities, before becoming Ambassador in 1978, **Mrs. Joseph** had a distinguished journalistic career, specializing in health, education, and other social concerns. As a contributing editor and columnist for the Minneapolis Tribune, she won the Sigma Delta Chi award for a series on hospitals, as well as five American Newspaper Guild awards for other writings.

Mr. **Lambert** said the addition of **Mrs. Joseph** creates an 11-person board for TCB, five of whom are outside directors.

Twin City Barge is a diversified company engaged in river transportation, barge construction and terminal operations. Its barging operations extend from the Twin Cities throughout the inland river system of the United States. In addition to barges, TCB also manufactures dredges and other types of marine equipment and operates a major terminal with a complete intermodal exchange between rail, truck and barge.

Award $3.9-Million Contract To Maryland Shipbuilding For Navy Tanker Overhaul

Maryland Shipbuilding and Drydock, Baltimore, Md., through the Trinidad Corporation, has been awarded a $3,960,000 fixed price contract for drydocking and overhaul work on the USNS Maumee, a government-owned tanker. The U.S. Navy's Military Sealift Command is the contracting activity. (N00033-70-C-0030)

$4.7-Million Navy Contract Is Awarded To R.C.A.

RCA Corporation, Government Communications Systems, Camden, N.J., has been awarded a $4,723,398 cost-plus-fixed-fee contract for the design, integration, and test of repair and maintenance equipment to support Trident integrated radio room equipment. The Naval Electronic Systems Command is the contracting activity. (N00039-81-C-0247)

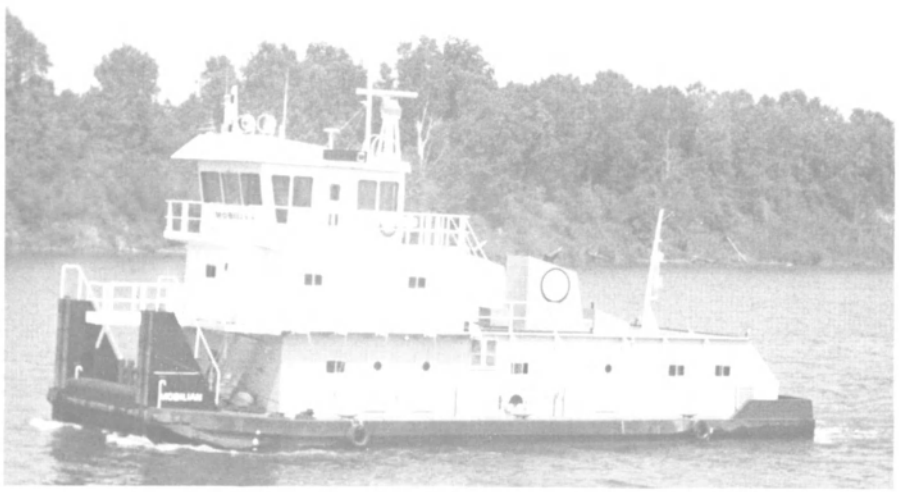
Megasystems Cargo Control Systems Ordered For Product Carriers

Avondale Shipyards, Inc. of New Orleans recently ordered three cargo control systems from Megasystems, Inc. of Boca Raton, Fla., and Cleveland, Ohio, for installation in three 43,000-dwt product carriers ordered earlier this year by Exxon Company U.S.A. of Houston, Texas. With a total price tag of $300 million, these ships will be fitted with the best and most sophisticated equipment available in the world today. They will be powered by 17,000-bhp diesel engines.

The cargo control consoles will be approximately 30 feet in length, and will feature full mimic displays as well as controls for each of the cargo tanks. Delivery of these ships is scheduled for 1983 and 1984.

For free literature on Megasystems' Cargo Control consoles,

Write **41** on Reader Service Card



Dravo SteelShip Delivers The 'Mobilian' For Warrior And Gulf Navigation Company

Dravo SteelShip Corporation, Pine Bluff, Ark., recently delivered the Mobilian (shown above), the first of a series of 85-foot by 30-foot by 10.5-foot towboats for Warrior and Gulf Navigation Company of Chickasaw, Ala.

The Mobilian is powered by twin Caterpillar diesel model 3512 engines—rated at 1,023 shp each —equipped with Cat 7241, 7.07:1 ratio reduction gears. The main engines with gears were supplied by Burford Engine Co. of Alabama. The vessel is equipped with Fernstrum keel coolers, Farr filters, and Nelson mufflers. The main engines with shaft brakes are controlled by a full Mathers system.

Twin radiator cooled Perkins/Lima engines with 50-kw generators supply the ship's power. The generators are controlled by a switchboard supplied by the Fagan Co.

Equipment services include: Quincy 5-hp air compressors, Reed 3-hp engine room ventilation blowers, 40-ton electric deck winches, and a 5-hp capstan.

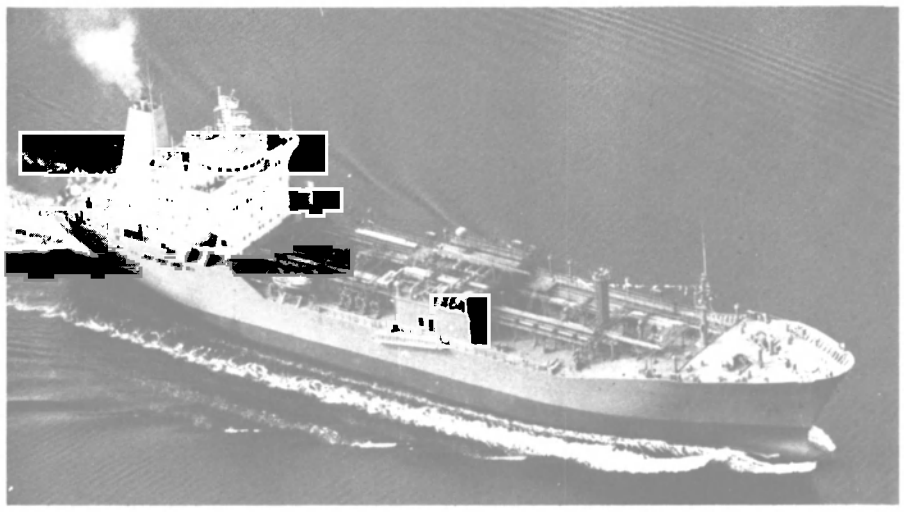
The steering is a DSS STD design mechanical over hydraulic with a Flow Systems of Arkansas hydraulic unit. The vessel is equipped with two Kahlenberg four-blade stainless-steel 80-inch by 70-inch propellers. The propulsion shafts and rudder stocks are provided with Strum sleeves. The vessel has four staterooms for a crew of seven. The marine sewage treatment system was manufactured by Redfox.

The pilothouse is equipped with an electronics package consisting of radar, twin VHF, "Ai" phone communication system, and loud hailer. The 2,000-watt searchlights are by Rayline, and the triplex air horn is from Kahlenberg.

The vessel is protected with a zinc/vinyl acrylic enamel and coal tar system by Devoe and Raynolds. Currently, Dravo SteelShip is building a series of 85-foot towboats with 1,800 hp to 2,146 hp.

Racal-Decca Awarded $1.1-Million Order By Swedish Navy

Racal-Decca Marine Radar, Ltd., has been awarded an order for 150 radars by the Swedish Navy. Estimated at $1.1 million, the order covers a range of Racal-Decca Clearscan and small boat equipment.



Moss Rosenberg Delivers First Of Three Chemical/Gas Carriers For Norwegian Owners

The Igloo Finn, an 11,200-dwt gas and chemical carrier was delivered recently by Moss Rosenberg Verft, a.s. to Partrederiet NEMO, Oslo, Norway. It is the first in a series of three and will be operated by A/S Havtor Management, Oslo.

The Igloo Finn (shown above) is a highly sophisticated multipurpose carrier designed to transport up to eight different cargoes simultaneously. The ship is a diesel-driven, single-deck vessel with forecastle and poop. She carries six free-standing, cylindrical, stainless-steel cargo tanks suitable for carrying gases as well as chemicals. In addition, two built-in wing tanks coated for chemicals only are arranged in the foreship. A deckhouse for a refrigeration plant is located midship.

The ship was classed by Det norske Veritas, class +1A1, EO, Ice 1A — "Tanker for Liquefied Gas" and "Tanker for Chemicals." The ship is also built in accordance with U.S. Coast Guard "Rules and Regulations for Foreign Flag Vessels," the IMCO Codes for gas and chemical carriers, as well as Finnish Ice Class 1A according to the Finnish-Swedish Ice Class Rules of 1971.

The main engine is a six-cylinder, slow-speed, turbocharged Sulzer diesel type 6 RLA 56. It has maximum output of approximately 7,590 bhp at 155 rpm and is directly coupled to a four-blade highly skewed nickel-aluminum-bronze controllable-pitch propeller. Trial speed is approximately 16 knots with propane loaded draft of 7 meters (about 23 feet) and 100 percent output.

The Igloo Finn has a "stainless" capacity of 8,300 cubic meters at 20 degrees C consisting of six pressure vessels all insulated with polyurethane. One tank is installed longitudinally in the forward hold and the others are installed transversely in the remaining holds. The tanks are designed to transport cargoes at minimum minus 104 degrees C and maximum plus 80 degrees C. Design criteria also include maximum specific weight of cargo 1.8 tons/m^3 and maximum tank pressure of 3.95 bar. Each tank is equipped with a separate loading/discharge line. The ship also is equipped with two coated, built-in tanks with a total of 600 cubic meters capacity. These are scantled for cargoes of specific gravity up to 1.0 tons/m^3.

The ship has a highly sophisticated cargo handling system, enabling the vessel to transport eight different cargoes simultaneously of which two are fully refrigerated. A refrigeration plant is located in a deckhouse midship and consists of three identical R22 cascade units. Two units each service three cargo tanks, while the third is a spare. Two refrigeration units have capacity to maintain a cargo of ethylene at atmospheric pressure when the air and seawater temperatures indicate plus 45 degrees C and plus 32 degrees C, respectively.

The ship is also equipped with indirect cooling and heating systems with capacity to maintain cargo temperature at minimum minus 30 degrees C and maximum plus 80 degrees C. The cargo is heated/cooled by circulating ethanol through coils welded to the exterior of the tank shells.

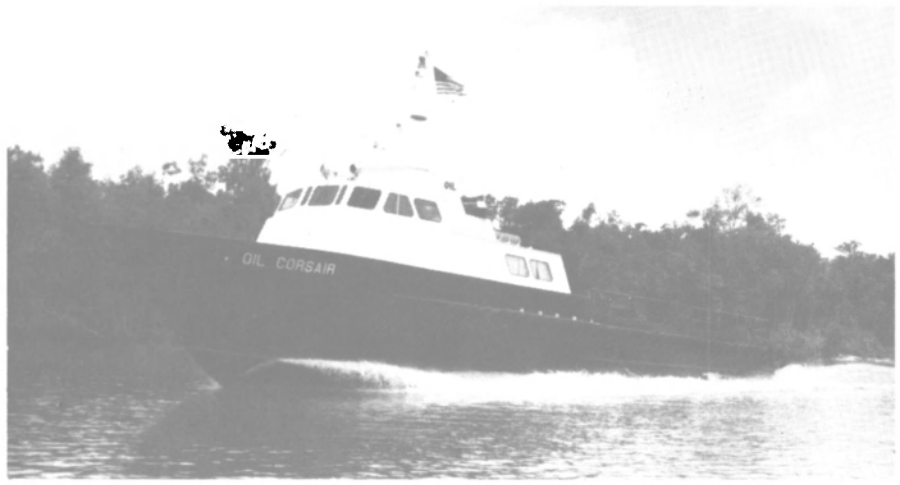
Loading can be accomplished from both over-pressure and atmospheric tanks in about 15 hours based on refrigerated tanks and gas return to shore. Each tank is equipped with a deepwell pump with 185 m^3/hr capacity for discharging. When discharging against high back-pressure, two booster pumps with 280 m^3/hr capacity each can be connected in series. During discharge, the cargo may be heated in a seawater heat exchanger. All tanks, which can be loaded and discharged independently, are equipped with a tank cleaning system.

The ship is designed to transport ethyelene, ethane, propylene, propane, butadiene, ammonia, MAPP gasses, VCM, butane, butane/propane mixtures, propylene oxide, C_4-stream, and butylene.

The Igloo Finn is equipped with two radar sets with anticollision devices, gyro equipment, echosounder, satellite navigator, etc. A gas-detection system and a 900 Nm^3/hr combined inert gas generator/incinerator have been installed. Both are designed and manufactured by Moss Verft.

IGLOO FINN	
Length	420 ft.
Beam	70 ft.
Depth	40 ft.
Draft:	
propane cargo 98% filled	23 ft.
ammonia 98% filled	24 ft.
VCM cargo	28 ft.
solvents (spec. weight 1.2)	31 ft.
maximum draft	31 ft.
DWT	11,200

Progressive Delivers First Boat For Africa



The 100-foot all-aluminum crewboat Oil Corsair (shown above) was loaded aboard the Japanese freighter Seki Rokel recently in New Orleans for service in the waters offshore Angola in West Africa, highlighting a "first" for the shipbuilder.

Built by Progressive Shipbuilders and Fabricators, Inc. of Houma, La., the Oil Corsair will be operated by Ocean Inchcape Limited, (Overseas Division) for Texaco . . . and is now the first boat built by Progressive to be shipped to Africa, **Joe Steverson**, president of Progressive, said. He hailed the event as a significant milestone in the history of his company, which has been constructing vessels for the offshore industry for the past three and a half years.

The design and construction of the vessel was praised by Capt. **John Thompson**, deputy general manager of the overseas division of Ocean Inchcape, and **John Lester**, manager of marine engineering for Ocean Inchcape.

The Oil Corsair will be the second crewboat to be put into operation in Angola for Ocean Inchcape, Ltd., but the company currently operates a fleet of vessels in offshore locations in West Africa and elsewhere, according to Mr. **Thompson** and Mr. **Lester**.

Especially designed for service under the most rigorous conditions, the Oil Corsair carries 3,000 gallons of fuel and 600 of potable water. She has a cruising speed of 22 knots and is powered by three GM Diesel Allisons Model 12V71TI. The boat has a 22-foot beam and her above deck loading area is designed so that she is capable of carrying 35 percent more cargo than boats of similar dimensions, Mr. **Steverson** said. The Corsair also has the capability of pumping extra water and fuel in emergency situations, which Mr. **Steverson** called "a real asset in cases of emergency on the rig."

The vessel's full instrumentation package includes radar, loran, single-sideband radio, VHF radio and Fathometer.

Primary ac power is supplied by two 50-kw generator sets or alternately by shore power. Emergency power for lighting, running lights and VHF radio is battery supplied.

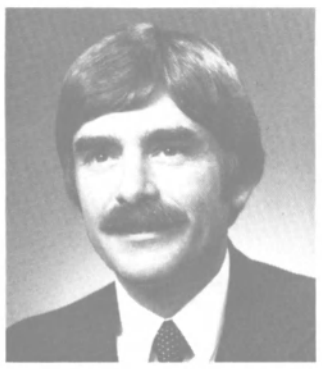
The ship's interior is air-conditioned. Its seating capacity is 56 and the crew quarters include accommodations for five plus captain's stateroom.

"We are proud that our first African vessel will be operated by Ocean Inchcape," Mr. **Steverson** said. The company, along with its sister company OIL (Asia) Ptd. Limited, operates more than 70 vessels of different classes, worldwide, since 1972. The United Kingdom-based company has been providing a variety of marine support operations for oil terminals since 1971.

In addition to 100 and 110-foot class crewboats, Progressive also builds smaller crewboats ranging in size from 32 to 65 feet, patrol boats, custom pleasure yachts, jackup barges and other types of boats for service to the marine and oil industries.

Bay Shipbuilding Names John Schermond New Manager Of Contracts

George K. Geiger, president of Bay Shipbuilding Corp., Sturgeon Bay, Wis., recently announced that **John F. Schermond Jr.**, former manager at the Chicago yard of American Ship Building Company, has joined Bay Shipbuilding as a manager of contracts.



John F. Schermond Jr.

Mr. **Schermond** succeeds **Francis (Doc) Kolbeck** who retired after 42 years of service with Bay Shipbuilding and its parent organization, The Manitowoc Company, Inc.

Mr. **Schermond** was employed by American Ship Building, Toledo yard, since 1966, and in 1973 he became manager of production planning, quality control and material control. In 1974, he was given the additional responsibility of yard repair superintendent. In 1977, Mr. **Schermond** was transferred to AMSHIP's Chicago yard as assistant to the manager. He became manager the following year and held that position until joining Bay Shipbuilding.

$24-Million Navy Contract Awarded For Overhaul

Service Engineering Company, San Francisco, Calif., is being awarded a $24,631,130 firm fixed price contract for Lot II of the regularly scheduled overhaul of the USS Camden (AOE-2). The Supervisor of Shipbuilding, Conversion and Repair, USN, San Francisco, Calif., is the contracting activity. (N62798-70-C-0009)

Zapata Christens Three Offshore Drilling Rigs Built In Singapore

Zapata Offshore Drilling Co., Houston, Texas, recently christened three new jackup drilling rigs in Singapore for its offshore fleet.

It was the world's first triple rig christening ceremony and brings the number of rigs in Zapata's fleet to 23.

Built at a cost of about $125 million, the rigs are three-legged cantilever design which enables them to drill both exploration and development wells.

Two of the rigs, Zapata Heritage and Zapata Sovereign, were built by Far East Levingston Shipbuilding, Singapore. They are equipped to drill in water up to 250 feet deep.

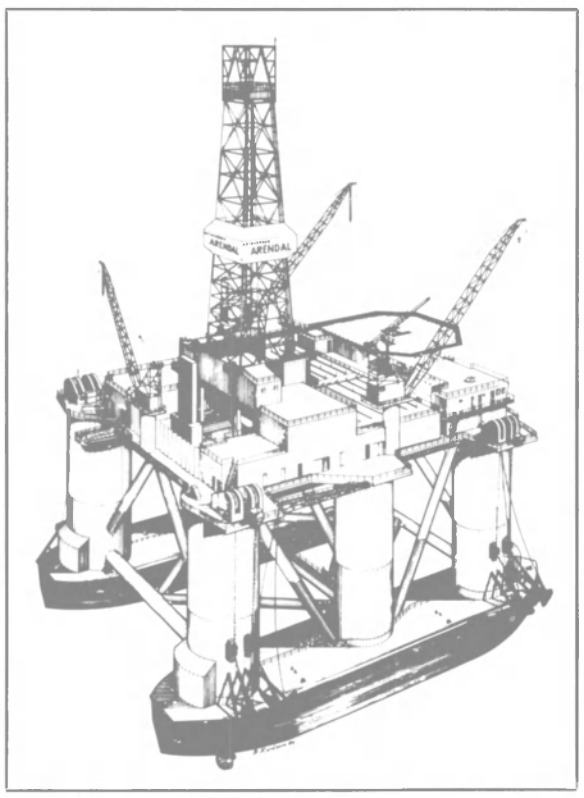
The Zapata Heritage will begin a two-year contract with Independent Indonesian American Petroleum (IIAPCO).

Abu Dhabi Marine Areas, the consortium responsible for offshore oil and gas exploration and production off Abu Dhabi in the United Arab Emirates, has chartered the Zapata Sovereign for four years.

The third rig, named Zapata Scotian, was built by Promet (Pte). Ltd., and is described by Zapata as one of the world's largest jackups in terms of storage capacity and structural strength.

Designed for drilling in severe environments, the Zapata Scotian is scheduled to work initially off Nova Scotia, Canada, under a three-year contract with Mobil. The rig has a variable deck load capacity of 2,500 tons and is equipped to drill in waters up to 200 feet deep.

Petro Canada Charters Semi Building At Gotaverken Arendal



Artist's rendering of the semisubmersible unit building at Gotaverken Arendal, Sweden.

A semisubmersible offshore drilling unit being built for Sverre Ditlev-Simonsen, Norway, by Gotaverken Arendal, Gothenburg, Sweden, has been chartered to Petro Canada for a five-year period.

The Pacesetter design unit is scheduled to begin exploration in June of 1982. Petro is the second Canadian company to order a Gotaverken rig. In June of this year, Dome Petroleum ordered the yard's GVA 4000 unit which will be built under license by Cammell Laird Yard, Birkenhead, England.

Bayou Black Delivers Sundance Sunset

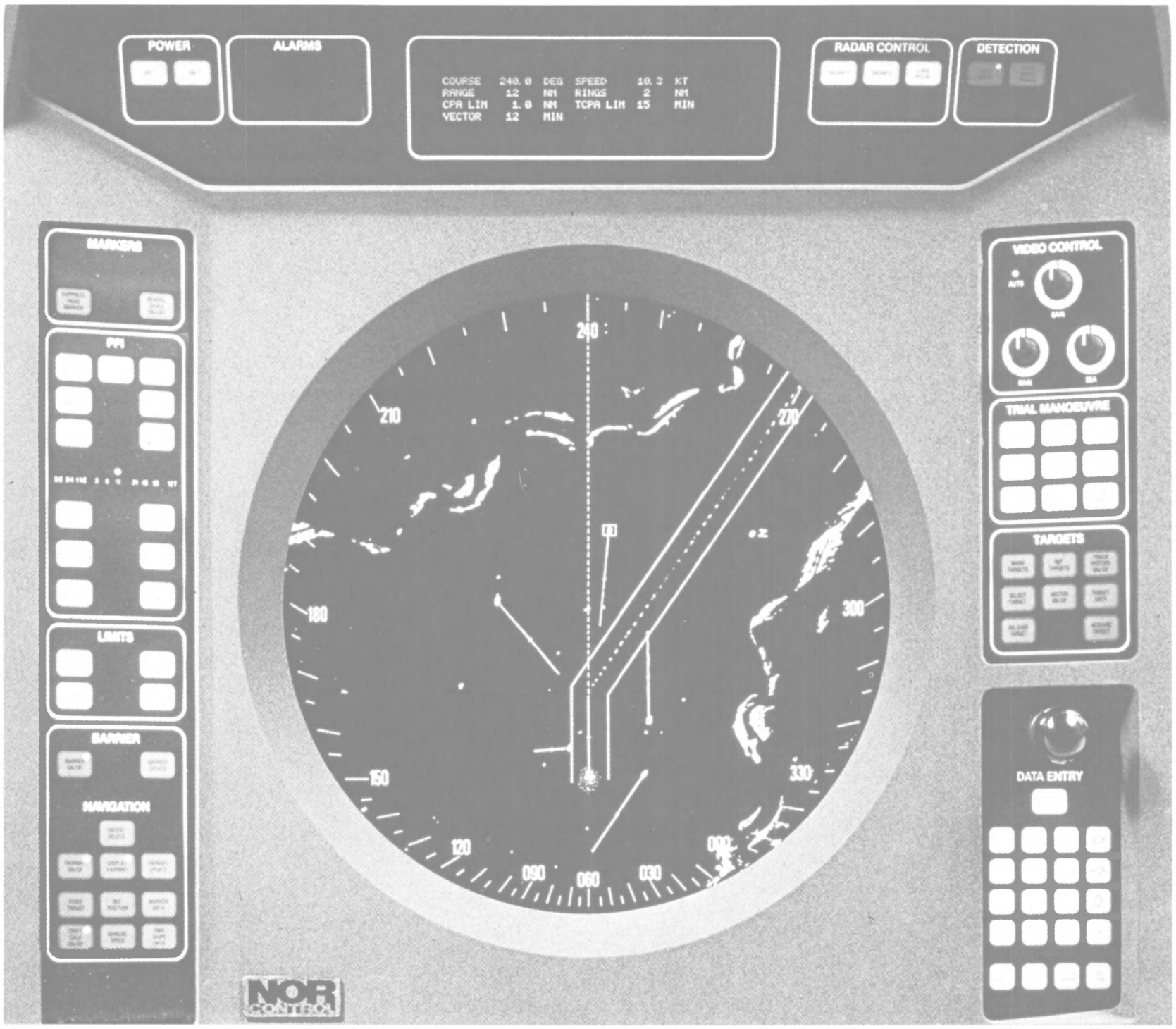
Bayou Black Shipyard, Inc., Gibson, La., recently delivered the Sundance Sunset (shown above) to Sundance Marine of Houston, Texas. The vessel was the fourth of its kind delivered to the Houston firm this year. The all-aluminum vessel is 42 feet long with a 13-foot beam, and 6.5-foot depth midship.

The main propulsion is supplied by two G.M. Detroit Diesel Allison 6-71 engines provided by George Engine Co. of Morgan City. Propellers furnished by Toups Propellers of Abbeville, La., are 28-inch by 30-inch Columbian bronze hydrosonic. Shafts are 2-inch stainless steel.

Fuel is carried in an independent 300-gallon tank located in the lazarette. Both engines are electric start with power provided by two 12-volt dc batteries.

Electronic equipment provided by Bibbins and Rice of Morgan City consists of a Standard Horizon VHF-FM radio, and a model No. 240, Mark II Furuno radar. Engine controls are Morse cable type and steering system is a self-contained hydraulic type. The vessel is U.S. Coast Guard certified to carry 16 passengers and a crew of two.

DATABRIDGE 7
THE ULTIMATE ARPA



DataBridge 7 is a third-generation Automatic Radar Plotting Aid that acquires and tracks up to 50 radar targets and continuously displays collision avoidance data on the most threatening 20. It will sound a collision warning alarm whenever any of these target tracks exceed user specified values for closest point of approach and time to closest point of approach. As a collision-avoidance system, it meets or exceeds all IMCO recommendations and U.S. Maritime Administration (USCG) Standards, soon to be mandatory for all vessels over 10,000 gross tons.

The DB-7 acquires targets throughout the operator-designated search area—not just when a target penetrates a guard ring. The system displays anti-collision data in the form of vectors superimposed over a daylight viewable 16″ radar presentation. Operator selection of true or relative vectors, and vector length provide the utmost in system flexibility. Full trial maneuver facilities, including operator selection of time-to-maneuver, quickly and clearly show the results of maneuver alternatives. The DB-7 warns the operator when the proposed maneuver does not satisfy his CPA and TCPA criteria or when it will bring him into conflict with a previously non-threatening target.

And DataBridge 7 is much more than a simple ARPA. Channels and fairways, radar locked to fixed geographical references, can also be displayed. In addition to warning the operator if the vessel strays from its intended track, this display provides the information that is vital to assure that a maneuver to avoid a collision with another ship does not result in a collision with the bottom.

And Norcontrol hasn't forgotten the operator. In addition to a control panel layout designed to simplify operation and reduce fatigue, the DB-7 includes a built-in training simulator. Preprogrammed training exercises are presented to the officer to develop his ability to operate the system and effectively use all of the information it provides. Operational problems related to new crew members or crew turnover are virtually eliminated.

Finally, Norcontrol's unquestioned reputation for reliability and service are your best assurance that the DB-7 will operate perfectly and keep on working for years to come.

NOR CONTROL

Norcontrol Division of Kongsberg AS, P.O. Box 145, Horten, Norway 3191 • (47-33) 41-436
Maritime Division, Kongsberg North America, Inc., 135 Fort Lee Rd., Leonia, NJ 07605 • (201) 947-6788
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Two Brochures Available On Sperry's Doppler Speed, Navigation Systems

Two brochures on two distinct doppler systems have been published recently by Sperry Marine Systems, Great Neck, N.Y.

One brochure concerns Sperry's Doppler Speed Log which measures speed and distance movements. The eight-page brochure describes the special features of the system—its components, installation planning data, specifications, and cabling. The system can be used with advanced radar, navigation, and computer systems either for new building or retrofitting.

The second eight-page brochure provides similar technical information on Sperry's Doppler Navigation Sonar (DNS). The DNS is a high-technology navigation system designed for use as a bottom and or water reference navigator for submersibles and surface vessels. Used in conjunction with a compass or gyrocompass, it provides the operator with primary navigation data including desired course set by the navigator, distances on course and across course, total speed, deviation from the desired course, altitude above the ocean floor, and compass heading.

For a free copy of the brochures,

Write 16 on Reader Service Card

SNAME Requests Technical Papers For 1982 Annual

The Society of Naval Architects and Marine Engineers (SNAME) has issued a call for technical papers to be delivered at the 1982 meeting to be held November 18-20—its 90th meeting.

The papers are selected for appeal to the broadest, most technically sophisticated audience possible. Members and nonmembers are encouraged to prepare proposals on any topic of interest to the marine field. Papers concerned with recreational boating or marine engineering are especially welcome.

SNAME has requested that a 400- to 500-word abstract, plus a tentative outline, be sent to headquarters at One World Trade Center, Suite 1369, New York, N.Y. 10048, by October 31. The Papers Committee will review the proposals by December 1981 and will ask selected authors to prepare a finished manuscript by April of 1982.

Five Executive Promotions Announced At Perko

Five promotions, including the appointment of an executive vice president and two new vice presidents, have been announced at Perko, Inc., Miami, Fla., manufacturer of marine lights, hardware, and accessories.

The announcement was made recently by **Marvin S. Perkins**, president.

Leroy F. Hollenbeck, formerly vice president, has been appointed executive vice president. He will continue to oversee manufacturing activities, but will also be responsible for additional management functions. Mr. **Hollenbeck** has been with Perko approximately 22 years.

Allen W. Matthews Jr., vice president of sales, becomes vice president of marketing. **John P. Rush**, sales manager, was promoted to assistant vice president of marketing.

Additionally, **Mike Angelone** has been named vice president of data processing, and **K. Timothy LePage** has been named vice president of purchasing.

McAllister Names Alban Division Manager

John P. Alban has been appointed to the staff of McAllister Brothers, Inc., New York, N.Y., as a manager in their Oil Transport Division. The announcement was made recently by **Brian A. McAllister,** vice president of the New York-based towing and transportation company.

John P. Alban

Mr. **Alban** has been involved with the New York towboat industry for over 40 years, having first signed on in 1939. He has risen through the ranks from deckhand to pilot to captain after receiving his certificates from the U.S. Coast Guard. He joined the management staff of one of the leading New York marine transportation corporations in 1952. During his years with management, Mr. **Alban** has taken a variety of courses including admiralty law at the College of Insurance in New York.

McAllister Brothers has been associated with marine transportation in the port of New York for over 115 years through four generations of the McAllister family. The firm operates 12 oil barges with load capacities from 10,000 barrels to 140,000 barrels. They serve the ports of New York, Baltimore, Norfolk, Philadelphia, and San Juan. Joining the fleet in November will be a new 80,000-barrel clean oil barge suitable for oil and chemical transportation. McAllister currently has more than 110 tugs and barges in its fleet.

Army Engineers Report Inland Waterway Traffic Grew 5 Percent In 1980

The U.S. Army Corps of Engineers announced recently that inland waterborne commerce reached 667 million tons in 1980, an increase of 5.5 percent over 1979 levels. Total domestic waterborne tonnage grew from 1.08 billion tons to 1.1 billion tons, a 2 percent growth.

Coastal traffic grew 5 percent, from 304.6 million tons to 320 million tons. Great Lakes traffic was down, from 13.6 million tons to 11.5 million tons.

Total foreign commerce also dropped by some 7 percent, with exports increasing 12 percent and imports 18 percent.

The 1980 data are estimates and are based on statistics collected and partially verified by the Corps of Engineers.

Ehrlich Appointed Asst. General Mgr. At Todd Galveston

Henry L. Ehrlich has been appointed assistant general manager of the Galveston Division of Todd Shipyards Corporation, it was announced recently by **Ben Martino**, division general manager. Mr. Ehrlich previously served with Ingalls Shipbuilding in Pascagoula, Miss., where he was director of machinery, test and trials. He served the Ingalls firm for 28 years, holding various management and administrative positions, including chief engineer of the East Bank facility and director of engineering of the West Bank facility.

DIESEL POWER REVIEW

Research Continues For More Fuel Efficiency With Lower Grade Fuels

The two major factors influencing diesel engine design and development continue to be the soaring fuel costs and deterioration in the quality of marine fuels. While most diesel designers are working to modify existing models to achieve lower specific fuel consumption, a milestone was achieved by Caterpillar with the recent introduction of an entirely new series of high-speed, heavy-duty diesels in the 800 to 1,600-bhp range.

The past year saw several new licensing agreements between European companies and U.S. engine manufacturers. Transamerica Delaval has been licensed by the Dutch company Stork-Werkspoor Diesel of Amsterdam to manufacture and market in the U.S. the TM 620 series, which will be known as the Enteprise/SWD TM 620 diesel line. Waukesha Engine Division of Dresser Industries will manufacture a line of medium-speed diesels in the 1,230 to 4,320 bhp power range under license from Sulzer Brothers of Switzerland. And Allis-Chalmers of Milwaukee has been licensed by B&W Diesel of Copenhagen to manufacture and market the Danish company's low-speed engines in the U.S.

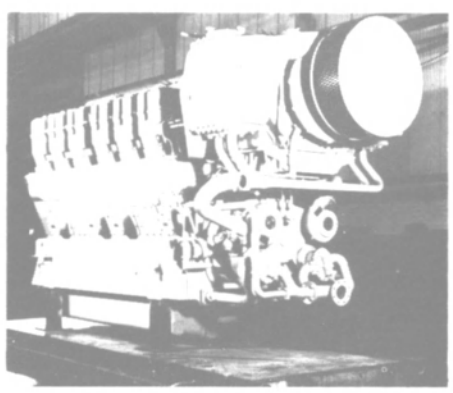
We asked the diesel manufacturers to tell us about their latest designs and developments; the following review is based on their replies.

ALCO POWER

The past year has been one of increased activity in the marine market for Alco Power Inc. With engine orders up from last year, Alco is looking optimistically toward the coming year. Early 1982 will find Alco engines being installed in vessels at three major inland yards — Dravo, Jeffboat, and St. Louis Ship. Recent installations include main propulsion engines for the towboats Jeffboat, Volunteer, Karen Ann, and Toutant, plus a tug for Gladders Towing. Current contracts include orders for a quantity of Alco engines for main propulsion of tugs and towboats.

Alco's capability in the marine market extends to specialized applications as well. One such application is the dredge Eagle 1, built by Avondale for Eagle Dredging, which entered service earlier this year. A split-hull hopper dredge, the Eagle 1 has two Alco 16-cylinder 251s for main propulsion and two Alco 6-cylinder 251s to drive the dredging pumps. Forced to meet stringent requirements, these engines are able to operate at a side pitch of 23 degrees, which becomes necessary when the vessel's split hull is opened to dump the dredging spoils.

In its ongoing effort to respond to the demands of the market, Alco will continue its research and development program for engines operating on blended fuel. In addition, Alco offers a marine training school at its St. Louis location to familiarize operators with engine characteristics and maintenance procedures. The "hands-on" experience offered by this program has been well received by those who have attended.



Alco Power's 12 cylinder model 270.

Historically, Alco has provided diesel engines for a variety of applications. All markets will benefit from the introduction of the Alco 270, a new engine now in production at the company's Auburn, N.Y., plant. Available in 6-, 8-, 12-, 16-, and 18-cylinder configurations, the larger-bore 270 offers more power (1,400 to 5,800 bhp) in a smaller package to complement the existing 251 model. Many of the 251's favorable characteristics have been incorporated into the 270.

Developed as an outgrowth of the Ruston RKC series diesel, the 270 is an engine of proven design and capability. Of interest to vessel owners is the 270's ability to burn heavy fuels up to 1500 seconds Redwood No. 1, and low fuel consumption under all operating conditions. The first 270s are expected in service in the spring of 1982, to be installed in a 9,000-bhp towboat.

For additional information on Alco Power's engines,

Write 51 on Reader Service Card

B&W— ALLIS-CHALMERS

Highest fuel efficiency, largest worldwide orderbook, license agreement with a U.S. manufacturer, M.A.N.-B&W Diesel market leader in large diesels: These are some of the ways in which the Danish diesel designer has made news during the past year.

Earlier this year a license agreement was signed with Allis-Chalmers of Milwaukee for the manufacture and sale/marketing

(continued on page 20)

Ed Miske, Barry Hall, Standing: Fred West, Dick Steiner, Duane Cozard, Bernie Logan, Fred Ramsden

"We're the guys who build 'em your way"

Building top quality into any design a customer demands, requires a special type of experienced craftsman. Fred Ramsden, 43 Year Employee:

"We custom design and build every barge to the customer's specifications and requirements. We don't limit them to preset standard designs and limited options.

"Knowing how to meet these different customer demands and their cargo handling needs, requires versatile experience, plus up-to-date construction knowledge and capabilities. You don't learn all that overnight.

"We know our trade, the latest developments in it, and take pride in our work. We know what makes a quality barge, and are always looking for better ways of giving the customers what they want.

"Our design experience and construction flexibility lets us build barges the customers' way that are competitively priced with barges built someone else's only way."

Experience, quality, value. HBC Barge builds barges in any size and configuration you need, for chemicals and other liquids, coal, grain and other commodities.

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HBC Barge

HBC Barge, Inc.
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Phone: (412) 785-6100

Diesel Power Review —B&W-Allis Chalmers

(continued from page 18)

of B&W low-speed engines on the U.S. market.

The old Burmeister & Wain diesel traditions are carried on in the new company, B&W Diesel, which after the takeover by M.A.N. is enjoying a well-secured financial base. In order to intensify the cooperation, a joint company has been formed — M.A.N.-B&W Diesel GmbH — to coordinate all diesel engine marketing and licensing activities.

Development of 2-stroke, low-speed engines will be concentrated in Copenhagen as B&W's responsibility. These engines will follow the uniflow scavenged design that in recent years has made commendable improvements in fuel consumption.

B&W recently announced, and already contracted for, an up-

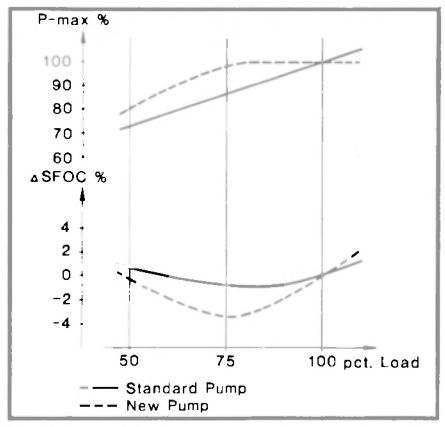
Power in BHP

Engine type	No. of cyl.	Bore/ Stroke mm	Max. continuous rating mep bar	r/min	C_m m/s	BHP/cyl	g/BHPh	Flexibility Range mep bar	r/min	BHP/cyl	g/BHPh
L90GB	4-12	900/2180	15	97	7.0	4570	133	15-12.8	97-79	4570-3170	133-129
L90GBE	4-12	900/2180	13	97	7.0	3960	130	13-11.1	97-79	3960-2740	130-126
L80GB	4-12	800/1950	15	106	6.9	3530	134	15-12.8	106-86	3530-2440	134-130
L80GBE	4-12	800/1950	13	106	6.9	3060	131	13-11.1	106-86	3060-2110	131-127
L67GB	4-12	670/1700	15	123	7.0	2510	135	15-12.8	123-100	2510-1730	135-131
L67GBE	4-12	670/1700	13	123	7.0	2170	132	13-11.1	123-100	2170-1500	132-128
L55GB	4-12	550/1380	14	155	7.1	1610	136	14-11.9	155-126	1610-1110	136-132
L55GBE	4-12	550/1380	12	155	7.1	1380	133	12-10.2	155-126	1380-960	133-129
L45GB	4-12	450/1200	14	175	7.0	1060	137	14-11.9	175-143	1060-740	137-133
L45GBE	4-12	450/1200	12	175	7.0	910	134	12-10.2	175-143	910-630	134-130
L35GB	4-9	350/1050	14.8	200	7.0	680	136	14.8-12.6	200-163	680-470	136-132
L35GBE	4-9	350/1050	12.8	200	7.0	585	133	12.8-10.9	200-163	585-405	133-129

B&W Diesel L-GB L-GBE Two-Stroke Diesel Engine Program.

rated version of the L-GFCA engine. The new L-GB engine has 15 percent higher output with a 3 gram per horsepower-hour reduction in fuel consumption. A fuel-optimized version, the L-GBE, has the same rating as the successful L-GFCA engine but with a substantial fuel reduction of 6 grams per bhp-hour. The L-GB and L-GBE, which will be available from 1983 onward, will be equipped with automatic adjustment of the fuel injection lead to achieve a further reduction in fuel consumption at part load.

The new L-GB and L-GBE Series will include a completely new size of B&W crosshead engine — 350 mm bore, developing 680 bhp per cylinder at 200 rpm. With outputs down to 2,720 bhp, it will be a direct competitor to many four-stroke, trunk piston engines.



Specific fuel oil consumption and maximum cylinder pressure for B&W engines supplied with standard fuel pump and variable timing fuel pump.

The joint M.A.N.-B&W four-stroke, trunk engine program embraces the original M.A.N. designs and the smaller B&W T/V 23L and S U 28L models, capable of burning heavy fuel.

Recently, the largest ocean-going tugboat ever built in the U.S. for Belcher Oil Company, was delivered equipped with a B&W low-speed engine of the type 7L67GFCA.

Another recent milestone was the installation of long-stroke, low-speed B&W engines in RO/RO vessels for the Swedish shipowner Brostrom, utilizing the engines' ability to accommodate an extremely low engine room height.

For additional information on the B&W Diesel engine program,

Write 52 on Reader Service Card

(continued on page 22)

THERE IS A DIFFERENCE IN TUGBOAT COMPANIES.

- The largest and most powerful fleet of tugs.
- Twelve new tugs in twelve years.
- More tugs in planning.
- Skilled Personnel.

Curtis Bay Towing Company

Over 68 years

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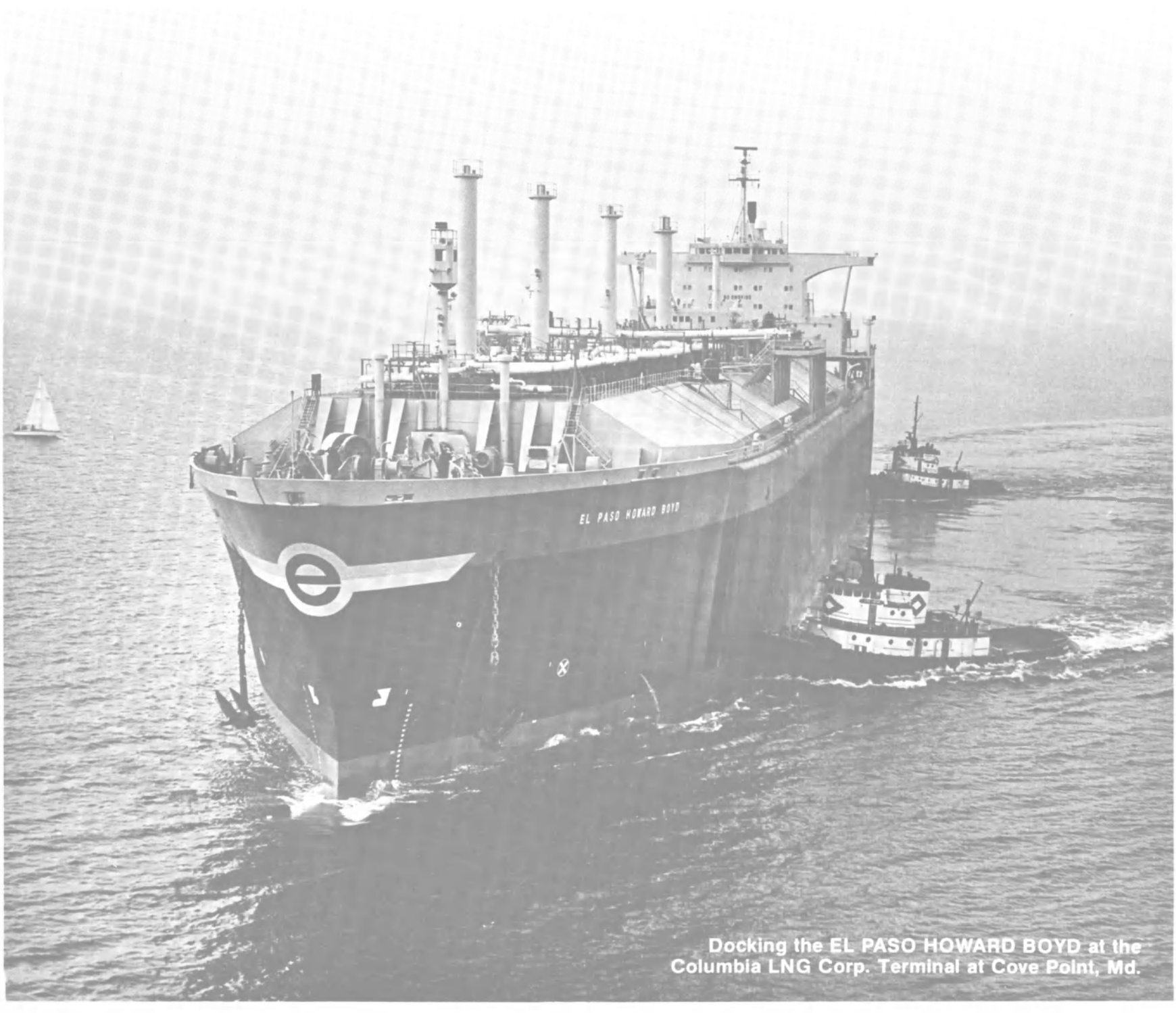
- Eight twin-screw tugs of more than 3000 hp.
- 3 port communications.
- 24 hours a day operation.
- Experienced, dedicated shoreside staff.



Docking the EL PASO HOWARD BOYD at the Columbia LNG Corp. Terminal at Cove Point, Md.

(continued from page 20)

B&W ALPHA

B&W Alpha division of B&W Diesel A/S is a company in the MAN-B&W Diesel group that designs, manufactures, markets, and services complete ship propulsion systems consisting of diesel engines in the power range of 475 to 4,770 bhp. Alpha Diesel has been producing these propulsion packages, which include controllable-pitch propellers, since 1903. Current production is about 180,000 bhp annually, equal to 1,000 cylinders for ship propulsion, mainly to types T/V23L-VO and S/U28L-VO.

The T23L-KVO in-line engine and the V-built V23L-VO have a bore of 225 mm, stroke of 300 mm, and output of 155 bhp per cylinder at 825 rpm. The S28L-VO in-line and U28L-VO Vee engine have a bore of 280 mm, stroke of 320 mm, and output of 265 bhp per cylinder at 775 rpm.

These engines were designed and developed to meet the demand for using lower grade fuels. The initial experience with intermediate fuel was based on B&W service results with the two-stroke, direct-coupled diesel engines for ship propulsion and auxiliary four-stroke engines, of which the first were in service before 1960. Extensive tests have been carried out with different lube oils and fuels of up to 3500 Sec. Redwood.

Since 1974 Alpha Diesel has tested different components to suit the demand for heavy fuel operation. For the past five years it has also followed up on service experience with its parent company B&W Diesel to find the best solution to obtain the highest benefit by using poorer quality fuel.

Today there are about 600 Alpha Diesel 4-stroke engines in service for main propulsion. Of these, some 135 are running on fuel of 250 to 1500 Sec. Redwood with good results.

More than 90 percent of the Alpha propulsion systems have been delivered with controllable-pitch propellers of the company's own design — a rugged construction that features a heavy mechanical linkage that has proved extremely reliable over the past 75 years.

For additional information on B&W Alpha propulsion systems,

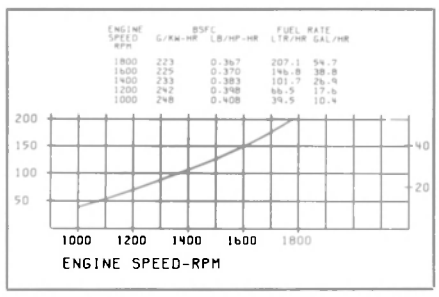
Write 53 on Reader Service Card

CATERPILLAR

The introduction of an entirely new series of diesel engines is a rare occurrence in the marine industry. Caterpillar accomplished this feat with the introduction of its entirely new 3500 Series earlier this year. This new family of high-speed, heavy-duty diesel engines in the 800 to 1,600 bhp (600-1,200 kw) range is designed to provide optimum value for a wide variety of applications.

The 3500 family will ultimately consist of V8, V12, and V16 models. The V12 (3512) was the first model produced, for limited distribution in the United States and Canada, with continuous and intermittent ratings of 1,055 bhp and 1,200 bhp, respectively. Worldwide 3512 availability was anticipated during the third quarter of this year. Limited geographical distribution of the V8 (3508) is planned for the fourth quarter 1981; the V16 (3516) is similarly planned for 1982.

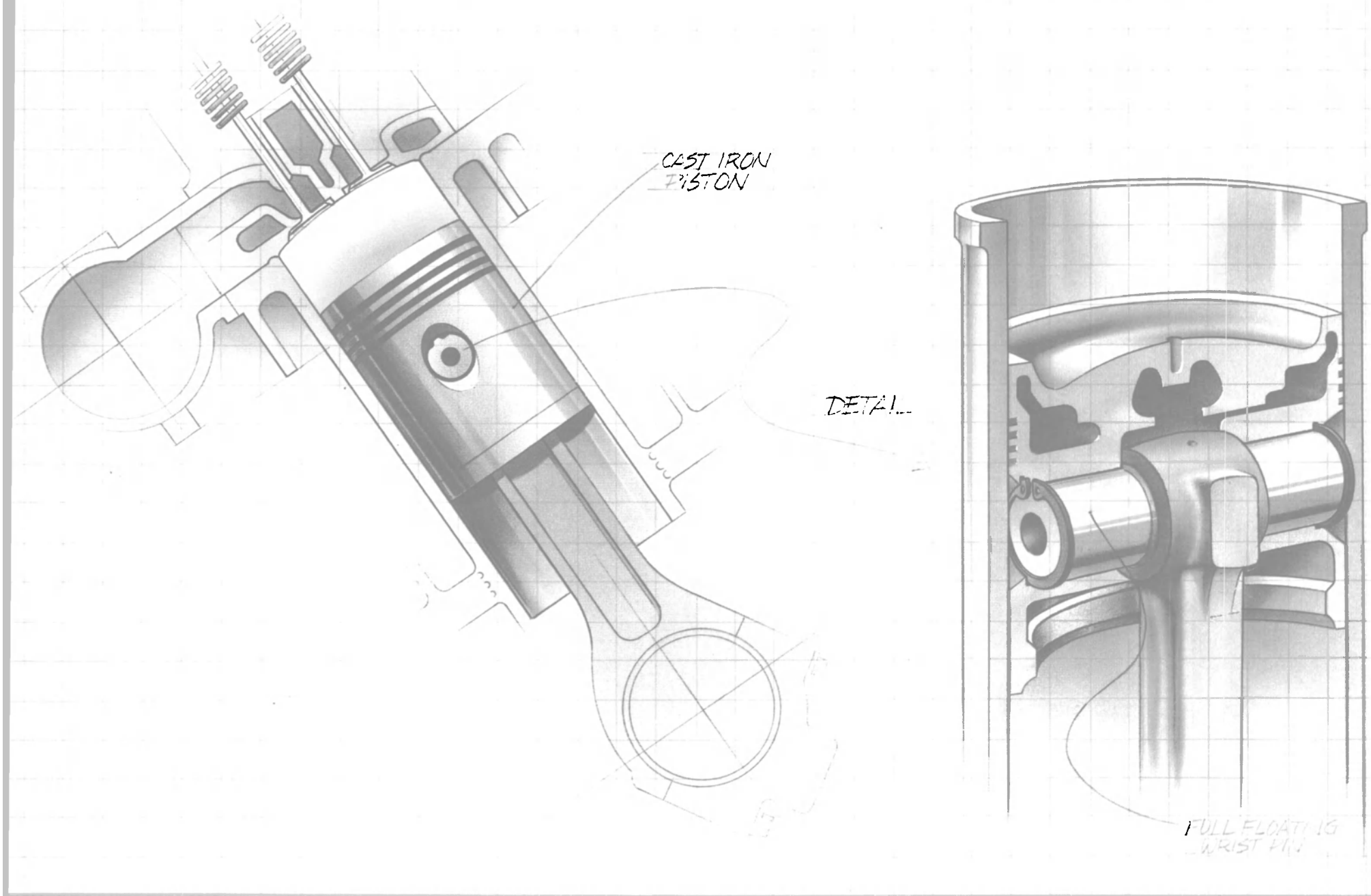
The 3500 Series is an additive to the company's 300 Series engine. The latter will remain in the Caterpillar product line to

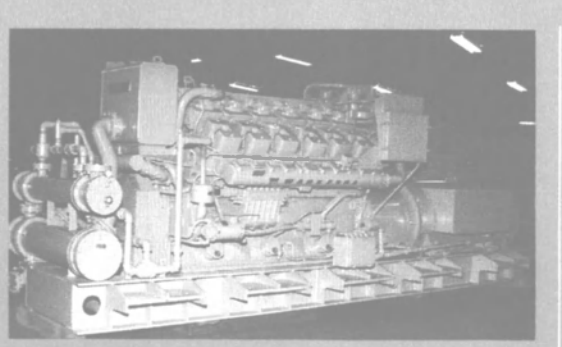


Fuel consumption for the marine version of the 12-cylinder 3512 (1055hp/787 kW continuous at 1800 rpm) is based on fuel oil having high heat value of 19590 BTU/lb (45570 kJ/kg) and weighing 7.076 lb/U.S. gal (848 g/litre). Performance is based on SAE J816B standard conditions. Metric rate is at left and English equivalent at right.

(continued on page 25)

Waukesha dependability is simply a matter of detail.





Waukesha VHP marine diesel engines feature cast iron pistons. For good reason. Dependability. A cast iron piston has the strength to withstand peak combustion pressures encountered during heavy-duty operation. Cast iron's strength allows thinner piston walls, so there can be channels inside the piston for improved cooling. And since a cast iron piston is made of the same material as the cylinder liners, it has the same coefficient of expansion.

Waukesha's closer and more constant piston-to-liner clearance means easier starting when the engine's cold. Yet without the danger of seizing-up under high heat, heavy load conditions. Blow-by is minimized, and there's less chance of piston slap.

Overall, cast iron pistons reduce the chance of major engine breakdown.

Waukesha cast iron pistons are connected to forged connecting rods by full floating wrist pins. Wear is more evenly distributed and extended than with semi-floating or stationary pins.

Metallurgical detail is only one example of how Waukesha engineers dependability into marine diesels.

See your Waukesha distributor for the full story on Waukesha marine engines or engine generator ship service systems.

Waukesha DRESSER

WAUKESHA ENGINE DIVISION
DRESSER INDUSTRIES INC.
WAUKESHA, WISCONSIN 53187

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This is no place to test an inert gas system.

That's why Foster Wheeler maintains a special facility for the sole purpose of testing our inert gas generators and analyzing their output. We're the only American producer of such systems with anything like it.

Here's how it works. Before we ship your inert gas generator, it is operated and tested under precise in-service conditions. The quantity and quality of the gas produced is analyzed. So you will know, even before installation, that your unit will reliably meet Coast Guard and IMCO standards.

Or if your flue gas is of sufficient quantity and proper quality, you may be able to utilize the Foster Wheeler flue gas scrubber. This system employs a highly efficient triplex scrubber that washes, cools and desulfurizes boiler stack gases. The clean, processed gas provides an inert gas blanket that prevents ignition for combustible cargoes.

To bring you the best of both systems, Foster Wheeler has paired its fifty years of marine boiler experience with that of Moss Rosenberg Verft. This Norwegian company has already installed more than 150 generators and scrubbers on ships the world over.

Together, we offer you the most efficient designs available anywhere. With proven safeguards that assure only non-combustible gas is distributed.

Since Foster Wheeler offers both inert gas generators and flue gas scrubbers, you can rely on us for an objective evaluation to assist you in the selection of the equipment best suited to your operation.

And no matter which system you specify, you know you're getting a proven performer.

For more information, write Foster Wheeler Boiler Corporation, Livingston, New Jersey 07039.

FOSTER WHEELER

Diesel Power Review —Caterpillar

(continued from page 22)

serve customers and the company's own product needs.

The 3500 Series engines were designed to produce 100 intermittent horsepower (74.6 kw) per cylinder, industrial configuration. Displacement is 2,105 cubic inches for the 3508, 3,158 cubic inches for the 3512, and 4,211 cubic inches for the 3516. All three models are four-cycle, dual-turbocharged, and jacket water aftercooled. The 3500 Series will be available in marine propulsion and large marine auxiliary configurations.

Typical 3512 applications include workboats, fishboats, dredges, cranes, and standby and prime power installations. The 3512 marine propulsion and marine auxiliary configuration has a 60-degree Vee to reduce physical engine dimensions for ease of installation. Inlet manifolds, aftercooler, and exhaust manifolds are mounted in the Vee for compact, uncluttered design.

Engines must perform with a minimum of downtime to keep operations profitable. The 3500 Series offers conservative loads, stresses, and speeds in a large-displacement, low-bmep package. From metallurgy through machining, assembly, and testing, all component specifications and tolerances are accurately maintained to assure customer value.

The 3500 Series has a large displacement of 263 cubic inches per cylinder. Turbocharging and aftercooling further increase engine performance and efficiency while decreasing thermal load. The cam-actuated, unit injection fuel system provides outstanding performance and economy. Three-ring piston design simultaneously reduces internal engine friction while maintaining oil control and compression.

Another benefit of the 3500 Series is that commonality of parts reduces inventory requirements, increases parts interchangeability, and reduces service time due to maintenance personnel familiarity. All 3500 Series cylinder heads, connecting rods, valves, pistons, and numerous other components are interchangeable.

Specialized attachments specifically designed for the 3500 Series include generator sets, matching marine transmissions, optional bases and foundation hardware, cooling systems, and various air cleaner arrangements.

The 3500 Series represents a fine balance of advanced engine design and application flexibility. High-speed capability allows the engines to compete effectively in applications horsepower and speeds not previously available with existing Caterpillar diesel engines. Finally, the 3500 Series engines are mechanically simple and efficient, and use proven components that have a high degree of commonality.

With the introduction of the 3500 Series engines, Caterpillar now has one of the most complete, technologically advanced engine product lines in the world — a product line that is celebrating its 50th anniversary in 1981.

For additional information on the 3500 Series and other Caterpillar engines,

Write 54 on Reader Service Card

COLT/PIELSTICK

Pielstick PC Series heavy-duty, four-cycle engines are among the most widely used marine diesels in world shipping service. A total of almost 3,000 have been built by all licensees; of this total, almost 2,400 engines have been for marine service.

Fairbanks Morse Engine Division, Colt Industries, has been the U.S. licensee for the PC-2 Series since 1970 and during that time has sold 124 of these engines, of which 56 were for marine service. In addition, the PC-4 Series is now being offered for marine applications.

PC2.5 engines have a rated speed of 520 rpm and are available in 12-, 14-, 16-, and 18-cylinder configurations. Maximum continuous output is 7,800, 9,100, 10,400, and 11,700 bhp, respectively. Bore is 400 mm, stroke is 460 mm, and displacement per cylinder is

(continued on page 27)

Start-up Savoir-faire

George Engine COMPANY INC.

Savoir-faire. Literally, "know-how."

That's how our Acadian neighbors in south Louisiana characterize George Engine.

Word spreads. Orange Shipbuilding just delivered its fifth FOSTI boat with engines and generators supplied by GECO.

It's the start-up *savoir-faire* of installation crew members such as Clay Mouton that keeps shipyards and operators like Orange and FOSTI coming back to GECO.

They know our start-up *savoir-faire* insures on-time deliveries for real-time utilization.

HARVEY (504) 368-3032/BATON ROUGE (504) 926-2910/LAFAYETTE (318) 235-9076/MORGAN CITY (504) 384-4990

Diesel Power Review —Colt/Pielstick

(continued from page 25)

3,528.3 cubic inches. Compression ratio is 11.5:1, and bmep is 280.6 psig.

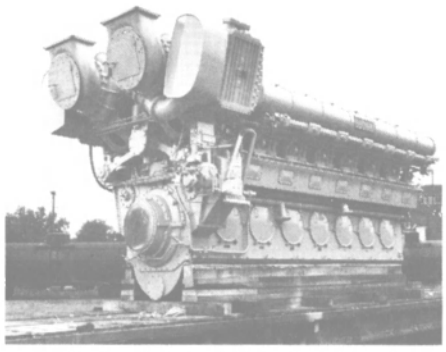
The engine frame is a welded fabrication, providing maximum structural capability with minimum weight. Individual cylinders are replaceable. Individual water jackets prevent any contact and corrosion between the jacket cooling water and the fabricated crankcase. Caged exhaust valves can be removed and serviced without disturbing the cylinder head. The PC2.5 engines have low fuel consumption over a wide output range, and the ability to burn heavy fuel having high vanadium content. More than 50 percent of the engines in operation run on residual fuels.

Early in 1973, SEMT (Societe d'Etudes de Machines Thermiques) presented to its licensees its latest development — a new four-cycle, heavy-duty engine — the PC-4. This engine was conceived with the dominant thought of 100,000-bhp marine power plants with the economy and practical features of the medium-speed engine. To accomplish this goal, design engineers had to focus on a substantial increase in power per cylinder, low specific weight per horsepower, minimum operating costs, and extended time between overhauls.

Thus, the PC-4 was born. The bore and stroke were increased to 570 mm and 620 mm, which extended the horsepower range to 1,500 horsepower per cylinder. The configuration of the engine is a Vee design with 10, 12, 14, 16, or 18 cylinders. Whereas the PC-2 has an operating speed of 520 rpm, the PC-4 operates at 400 rpm.

In general, the structure of the PC-4 engine is similar in appearance to the PC-2 Series. It has a monobloc frame made of cast steel components and steel plates welded together. It has an underslung crankshaft, with each bearing cap being fixed through two vertical tie-bolts. Individual cylinders, including water jacket, liner, and head are tightened on the frame through eight long studs. The inlet manifolds are located outside the engine, and the exhaust manifold inside the Vee. Lateral camshafts are located in the frame.

With the PC-4 it is feasible to supply up to 54,000 bhp with two engines, which approximates the maximum power that can be absorbed by one propeller. A 100,000-bhp marine propulsion system is possible with four engines on two propeller shafts. Four engines can be set side by side in a ship's hull through a new design configuration. This design also allows far-aft placement of propelling machinery and permits maximum use of space for cargo. PC-4s are available as



14-cylinder Colt Pielstick diesel for tanker application.

reversible engines, with full power output in reverse, and can be equipped for automatic operation.

During the past year, Colt-Pielstick activity has been highlighted by the U.S. Navy LSD-41 application and the three Catugs built by Avondale for subsidiaries of Occidental Petroleum.

For additional information on Colt-Pielstick marine diesel engines,

Write 55 on Reader Service Card

CUMMINS

Cummins "K" series marine diesel engines are proving their mettle in a variety of workboat and fishboat applications. According to Cummins, its K engines respond to the market's demand for increased horsepower, better fuel economy, and easier maintenance.

At the top of the K line is the

(continued on page 28)

Diesel Power Review —Cummins

(continued from page 27)

KTA-3076, a turbocharged and aftercooled 16-cylinder diesel that produces 1,250 bhp at 1,800 rpm during continuous-duty operation. The V-16, 3,067-cubic-inch engine weighs just 10,700 pounds, providing a high horsepower-to-weight ratio. Its fuel consumption is rated at 63 gallons per hour. Individual cylinder heads and replaceable wet-type liners help ease service.

The 300-ton towboat Paul A. Wronowski, recently put into service by **John A. Wronowski's** Thames Shipyard in New London, Conn., is the first vessel powered by the KTA-3076; the 90-foot boat is powered by two of them. Mr. **Wronowski** points to long years of satisfaction with Cummins engines and service, and says another big reason he chose Cummins is his concern for fuel economy.

The newest towboat to enter the fleet of Brent Towing Company of Greenville, Miss., the Melinda Brent, is powered by twin Cummins KTA-2300 engines. The KTA-2300 produces 940 bhp at 1,800 rpm during continuous duty. The V-12, 2,300-cubic-inch engine is also available in a non-aftercooled model, the KT-2300, rated 700 bhp at 1,800 rpm. Both 2300s feature the same easy maintenance characteristics as the KTA-3067.

Brent Towing is among the first inland waterway operators to take advantage of the K's fuel economy and performance, although the engine has been a favorite of crabber and trawler operators since its introduction in 1979.

The 2300 is said to be one of the most fuel-efficient diesels available for its size, with a fuel consumption rating of 47.4 gallons per hour in continuous-duty applications.

The smallest entrant in the Cummins K series is the KTA-1150, a turbocharged and aftercooled, 1,150-cubic-inch, in-line six rated 520 bhp at 1,800 rpm for continuous-duty operation. It has the most economical fuel consumption in its horsepower class, according to published manufacturers' fuel consumption curves. Shippen Marine Inc. of Houston recently put into service the first workboat to be powered by four KTA-1150 engines, the Comet, a 110-foot crew/supply boat.

The KTA-1150 and its non-aftercooled version have also proven popular among fishing fleets, including Singleton Fleets, Inc., a 70-boat shrimping company based in Key West, Fla. Its most recent 15 boats are powered by 1150s. Company president **Henry Singleton** says he selected Cummins engines because of superior fuel economy and attentive field service.

Cummins Engine Company started manufacturing marine diesel engines in 1921 and has since become a leader in marine diesel technology. In 1932 Cummins introduced the first high-speed marine diesel, and followed up in 1937 with the first supercharged marine diesel. In 1952 the company significantly boosted the horsepower of its marine engines by introducing the first high-speed turbocharged diesel. Cummins engineers tackled the size and dimension problems posed by early marine diesels when they introduced the first "oversquare cylinder" marine diesel in 1961.

Today Cummins offers seven different series of marine diesels for a full range of workboat, fishboat, and pleasure craft applications.

For additional information on Cummins marine diesels,

Write 56 on Reader Service Card

DETROIT DIESEL

The trend has been for more and more horsepower, and the Detroit Diesel Allison division of G.M. has responded with higher ratings for its high-output 149 series. The Detroit Diesel 16V-149TI, turbocharged and intercooled diesel engine delivers up to 1,570 bhp in marine applications, 1,800 bhp in other indus-

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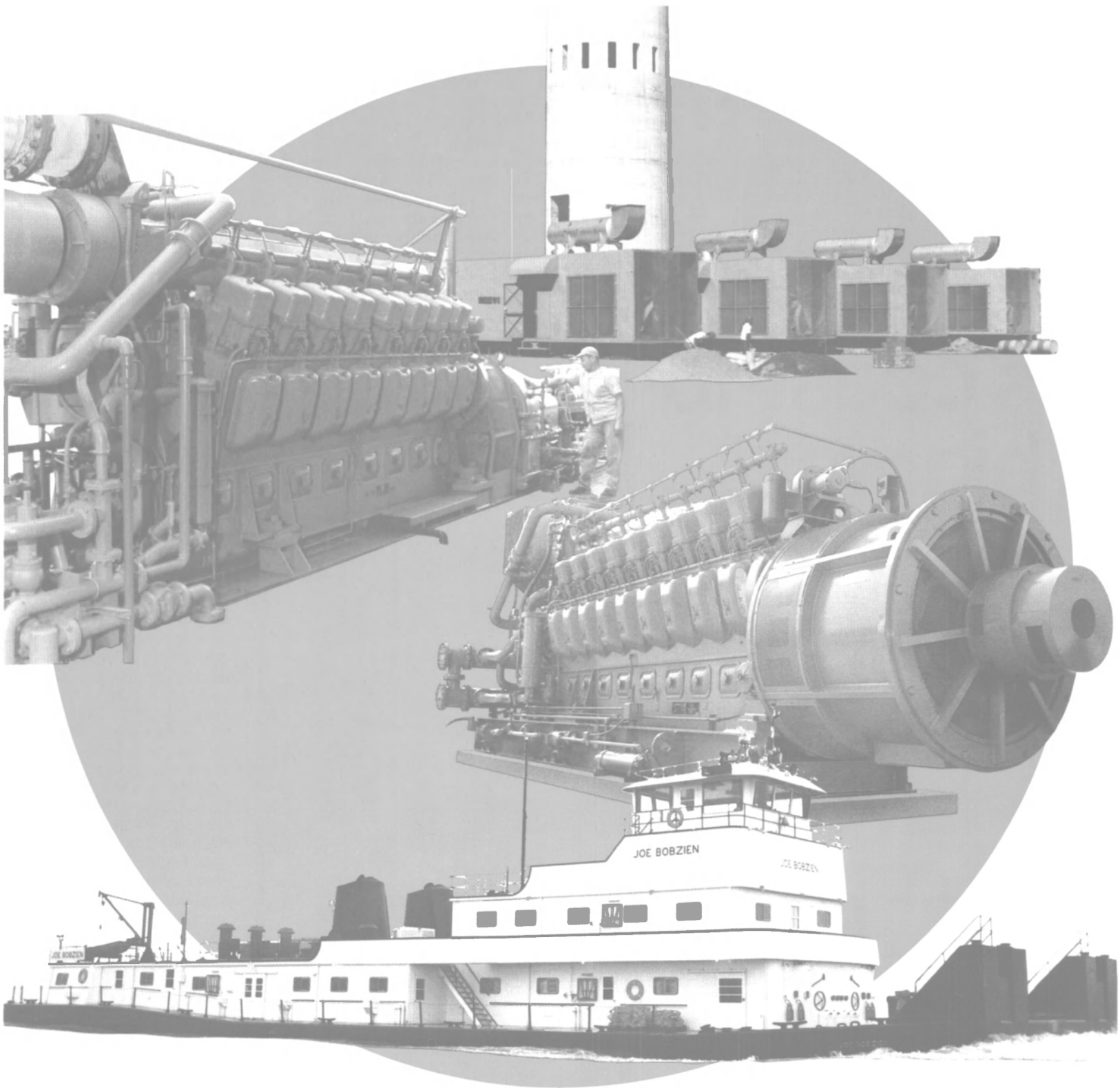

ALCO® Versatility

"Competent in many things" — that's an accurate description of the ALCO diesel. Whether the diesel needs be for marine propulsion, power generation, standby power units or pumping — you will find your ALCO "competent".

Reliability is proven in thousands of demanding applications worldwide. Identical construction methods of the basic cylinder model sizes allow interchangeability of major components, trim inventory costs, and also allow standard modifications to be inexpensively added, thereby easily adapting the ALCO to any specific application requirement.

Maintenance costs are exceptionally low — a major cylinder overhaul takes less than four hours. Our fuel consumption figures are the envy of many other engine users and manufacturers, and — we are not stopping here. New improvements and products are in the offing — including dual fuel and spark ignited gas engines.

All of this is the result of years of diesel experience — a joint total of three and a half centuries within the GEC Diesel Group of which ALCO is a part. Tie this to ALCO's continuing investment program at it's Auburn, New York manufacturing facility to incorporate the most modern features of production technology in the manufacture of diesel engines and you will readily recognize the dedication ALCO has to it's present and future customers.

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

ALCO®
Diesel Engines

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Diesel Power Review —Grandi Motori Trieste

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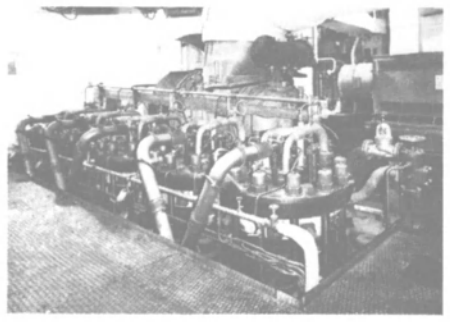
and production whose keynote is versatility. It is intended for the widest possible range of ship propulsion duties—direct coupled in vessels where higher propeller speeds are used, or geared to give optimum propulsion efficiency at generally lower cost.

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.



The first CC 600 was installed recently on the "Marigola."

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 CC 600 was installed recently on the "Marigola," a sophisticated 12,000-dwt petrochemical tanker constructed at Italy's M. & B. Benetti yard. It is a five-cylinder unit of 8,250 bhp.

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 service speeds from 145 to 160 rpm.

For further information,

Write 61 on Reader Service Card

KRUPP MAK

Having made a start with 8,000-bhp engines for ferries, Krupp MaK subsequently began supplying other important sectors of the North American market. MaK engines are now in service as main propulsion plants on the Great Lakes, in the Atlantic and Pacific fishing industry, in dredging, in tug/barge systems,

(continued on page 34)

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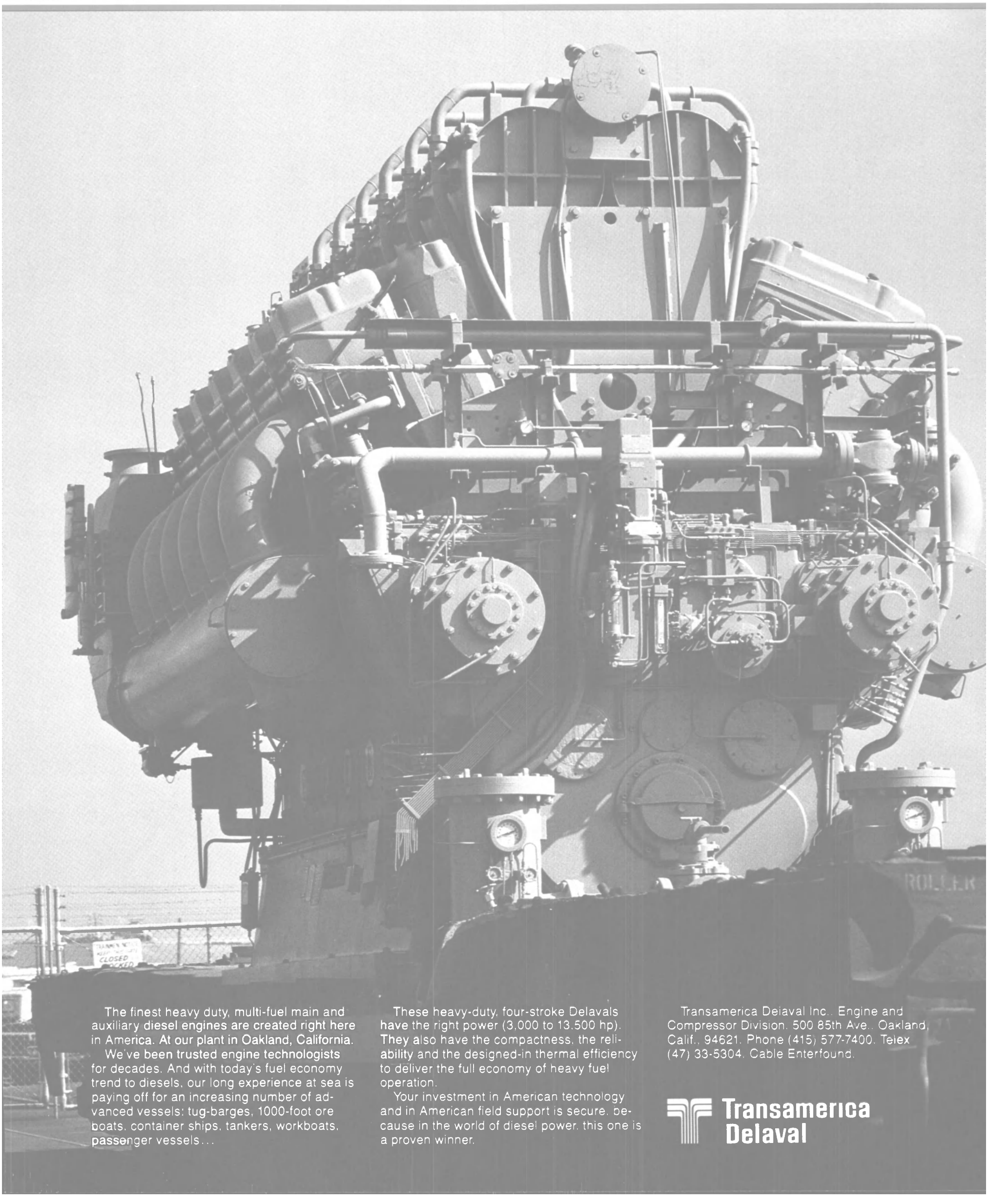
One Proud American



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

Diesel Power Review —Krupp MaK

(continued from page 32)

and also as auxiliary marine engines.

In addition to numerous marine diesel oil engines, more than 20 engines for operation on heavy oil have been sold to North American shipping companies. This reflects the great interest shown by American customers in heavy-oil diesel engines.

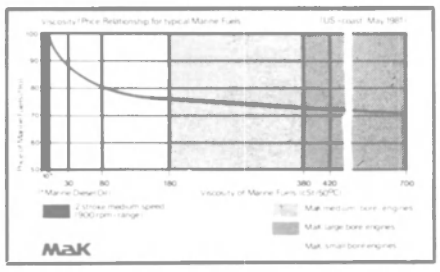
G. Kuhl, president of Krupp MaK Diesel Inc., points out that his company has always stood by its product and given its customers efficient after-sales service. In Chicago, close to the world's busiest airport, Krupp MaK set up its sales and service center, including a comprehensive spares depot. Advisory and after-sales service for customers is in the hands of MaK's own specialists, who have many years' experience with MaK engines.

Krupp MaK supplies heavy-oil engines in the output range from 740 kw (990 bhp) to 9,000 kw (12,070 bhp). The M 331/332/282 engines, with configurations of 6, 8, or 12 cylinders, has a bore of 240 mm and output range from 740 kw to 2,200 kw. The M 452/453 model, with 320-mm bore and power output from 880 kw to 4,800 kw, is manufactured with 6, 8, 9, 12, or 16 cylinders. With the same cylinder configuration, the M 551/552 has a bore of 450 mm and output from 3,200 kw to 9,000 kw. The biggest engine in the line, the 580-mm bore M 601, is provided in 6, 8, or 9 cylinder versions with output ranging from 6,000 to 9,000 kw.

MaK diesels work on the 4-stroke principle and are manufactured as in-line and V-type engines. All MaK engines are distinguished by their robustness and low specific load characteristics. The mean pressures of all the engines lie below 18 bar. Except for those with a 240-mm bore, they have multi-section engine blocks with tension-rod assembly and embedded crankshafts. The structural components enclosing the combustion chamber are specially designed for heavy-oil operation. Outstanding features include high resistance to wear and to high- and low-temperature corrosion, and low component temperatures through intensive cooling.

Other features include built-up pistons with steel crowns and hardened annular grooves; specially designed piston rings with chromium-plated working surfaces; bath-nitrided liners with high resistance to wear and corrosion, with wear values below 0.01 mm per 1,000 hours; and intensively cooled exhaust with wear-resistant armoring, manufactured by MaK to the highest possible standards and tested down to the last detail.

MaK engines have proved reliable in all applications. Krupp MaK is devoting particular attention to the following objectives in the field of research and development:



Further reduction of specific fuel consumption combined with reliable combustion of the lowest grade bunker fuels;

Participating in working groups with the aim of obtaining residual heavy oils suitable for marine purpose;

Improvements in bunker fuel operation by retaining the usual load characteristics and by intensive research into materials.

For additional information on Krupp MaK engines,

Write 62 on Reader Service Card

M.A.N.

The current oil market situation requires engine builders to concentrate their efforts on designs with both low fuel consumption and the capability of running on heavy fuel oil. Engines with a low fuel consumption and high heavy fuel oil compatibility demand a high firing pressure/mean effective pressure ratio.

The engines included in the

current M.A.N.—B&W production program have been designed with a view toward a high firing pressure ratio. In continuous service, the engines with bores from 32 cm to 52 cm operate at firing pressures of up to 145 bar. By means of precision changes not involving extensive redesign, high firing pressures can be attained with mechanical stresses remaining within controllable limits.

The engine program of M.A.N. (Maschinenfabrik Augsburg-Nurnberg 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 effective 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.

For additional information,
Write 63 on Reader Service Card

MOTOREN- UND TURBINEN-UNION

The latest addition to the diesel line of West German engine manufacturer Motoren- und Turbinen-Union is a new 16-cylinder engine in the 396 Series, extending the power range of the Series to 2,400 bhp. MTU's 02 version of the 396 Series has found wide acceptance throughout the world, with some 1,600 engines in V 6, V 8, and V 12 models in service up to mid-1980.

Now, based on long operating experience with the 02 version, MTU has introduced the 03 version of the 396 Series, providing a further increase in performance. Major technical modifications contributing to the increased performance are an increased mean effective pressure with a concurrent reduction of

(continued on page 36)

Diesel Power Review —M.T.U.

(continued from page 35)

the pressure ratio, and introduction of composite pistons, as well as better matched turbocharger and injection systems.

MTU cites intensive turbocharger research, in particular, that allowed a considerable rise in the engine output without increasing specific fuel consumption. Another important feature is the introduction of the cylinder cutout, which minimizes any problems during startup, idling, and part-load service.

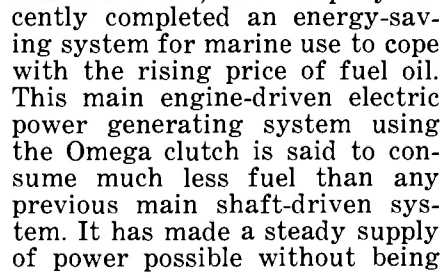
The actual cutout is effected with a divided injection control system developed by MTU. To cut off fuel to selected cylinders, an expansion piston is filled with oil and holds one section of the control rack at zero delivery while the other section operates normally.

The long-stroke (185 mm) 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 engine series possesses an unusually high degree of power concentration and maximum accessory integration. Its main features include extremely compact construction, favorable power-to-weight ratios, favorable bulk-to-power ratios, and direct flange mounting of driven equipment and driveline components.

The various drive units are arrived at by combining identical prime movers with application-oriented, thoroughly proven accessories. These packages are tested in their ready-to-install condition in the factory test cells under realistic on-site conditions. They can be placed in operation almost immediately on site after the support and power transmission systems have been connected.

Special features of these power packs include functional reliability, easy access to the engine and accessory components, and ease of maintenance, the latter including simple maintenance procedures, low maintenance costs, and simplified spare parts inventories.



The MTU 20V 1163 class engine.

MTU's total diesel engine program ranges from 435 to 7,080 bhp, with a choice of rpm from 1,000 to 2,400. Building on the experience gained with the 956 counterpart, MTU developed the 1163 family, which is aimed especially at 60 Hz power generation and marine applications. Owing to the extended length of the stroke, the power offered by the 1163 model at 1,200 rpm is the same as that of the 956 engine at 1,500 rpm, with the per-cylinder as high as 354 hp.

For additional information on MTU engines,

Write 64 on Reader Service Card

NIIGATA ENGINEERING

Niigata Engineering Company, Ltd. of Tokyo started manufacturing diesel engines for marine use in 1919, and currently produces a wide variety of diesels ranging in power output from 90 to 27,000 bhp. With its cumulative production reaching 15 million bhp, Niigata has grown into a manufacturer of medium- and small-size diesels.

Drawing on its long experience and know-how, the company recently completed an energy-saving system for marine use to cope with the rising price of fuel oil. This main engine-driven electric power generating system using the Omega clutch is said to consume much less fuel than any previous main shaft-driven system. It has made a steady supply of power possible without being

affected by the rpm of the main engine.

Notable features of the system include:

Adoption of the Omega clutch stabilizes the speed of shaft revolutions at the output even if the revolution speed at the input should change drastically. As a result, main engine-driven electric power generation becomes possible even for vessels with fixed-pitch propellers, which normally makes such power generation difficult.

As it enables the main engine to drive the generator, grade C heavy oil can be used in place of the normally used grade A heavy oil. The price difference between the two grades of heavy oil results in a saving of 25 to 30 percent in power generation cost.

Smooth switch-over — without blackout as originally feared — from the main shaft-driven generator to the independent auxiliary generator in a crash astern while at sea or when navigating at slow speed in entering or leaving port, has been verified.

For additional information on Niigata diesels and the power generating system,

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OOSTERHUIS/ MITSUBISHI

During the late seventies, Oosterhuis Industries researched the U.S. domestic and foreign engine market for lower horsepower, high-rpm diesels capable of operating successfully on lower-quality fuel oils. This search resulted in the appointment of Oosterhuis as distributors of SN and Daiya diesels for Mitsubishi Heavy Industries America, Inc. The high-speed Mitsubishi SN Series diesel engines are manufactured by Mitsubishi at its modern plant in Sagamihara near Tokyo, and shipped to Oosterhuis in standard execution. At Oosterhuis' facilities, engines are further packaged for U.S. domestic use, which includes the installation of U.S.-made SN full-flow lube oil filters, and the incorporation of Synchro-Start overspeed devices and Murphy instrument panels.

The Mitsubishi SN Series are available in a power range of 350 to 1,600-bhp as propulsion units for offshore supply vessels, tugboats, pushboats, and for generator drives and other applications. The rpm ranges from 1,200 to 1,800 at maximum continuous rating.

Recent orders include quadruple engine installations for tug/supply vessels utilizing two S16N and two S8N engines driving through hydraulic compound gears, with master and slave controls and fixed propeller. The 8-cylinder S8N starboard engine drives, while disconnected from the propeller shaft, a mud compressor by means of a front-mounted power take-off. The port-side S8N engine has a similar hook-up with a fire pump connected to a high-pressure, large-capacity fire monitor on deck. Other quadruple installations call for use of four S16N engines with controllable-pitch propellers.

In addition to the packaging and marketing of Mitsubishi SN diesels, Oosterhuis Industries, through its affiliated company, American Brons Corporation, maintains a license for manufacturing of Turbodiesels designed by Brons Industrie of the Netherlands. The first American Brons diesels became operational during 1979. They have logged approximately 10,000 hours, and have proven to be reliable and economical to operate.

For additional information on the Mitsubishi SN Series and the American Brons Turbodiesels,

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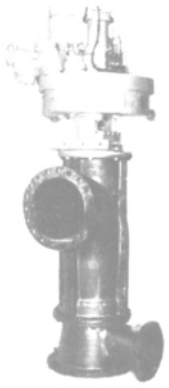
PAXMAN DIESELS

U.K. engine builder Paxman Diesels has developed a new supercharged engine in a bid for submarine orders. Derived from Paxman's Valenta engine line, the now model relies on a mechanical supercharger rather than a turbocharger. The company hopes that this engine will operate satisfactorily when a submarine is

(continued on page 40)

EX-U.S.-NAVY EQUIPMENT

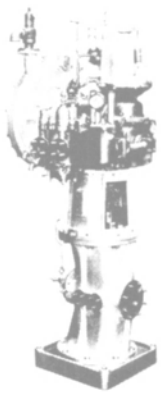
NEW — IN CRATES



UNUSED TURBINE DRIVEN CIRCULATING & BILGE SERVICE PUMP

EX-U.S.N.
DE 51 CLASS

Warren 6000 GPM — 11.5 lbs — Drawing BS5-1622 — size 14 — V.P. axial flow 375 PSI total head. 1600/1225 RPM — 56.5/42.5 HP. NSN-4320-00-360-1905



UNUSED

DE LAVAL FUEL OIL BOOSTER

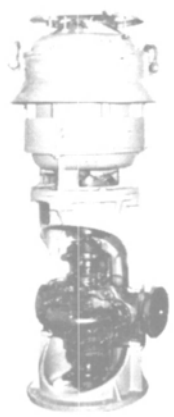
Ex DD 692 & 445 Class fuel oil booster pumps — mfg by De Laval. 100 GPM @ 100 PSI — suction lift 20" Hg. 11 HP steam turbine 6355/5503 RPM — pump RPM 410 — 590 PSI/15 lbs back pressure.

MAIN CONDENSATE PUMPS

U.S.N.
DD445
&
692 CLASS

(1) Worthington pump — 325 GPM @ 1150 RPM — 162 ft. radial flow operating position — 2-Stage single suction — CW rotation. De Laval Turbine — 24.2 HP — 590 PSI — 5367 RPM. NSN 4320-00-267-4467.

(1) Buffalo pump — 335 GPM — 162 ft head — size 4½" — 21.2 HP — 1150 RPM — Inlet 9" — outlet 5" — 2-stage impellers 14¼"/13¾". Turbine: Terry — YW-1 — 22.7 HP. Gear: 5360/1150 RPM — 590 PSIG NSN 4320-00-267-4275.



250 GPM — 150 LBS WARREN CENTRIFUGAL FIRE & BILGE EDUCTOR PUMP

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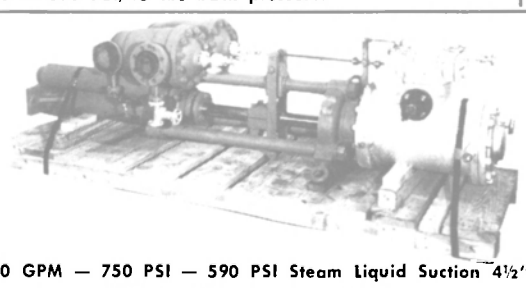
All Naval bronze. 36.5 BHP—3500 RPM—3" discharge—4" suction. Test pressure 300 lbs. Discharge pressure 150 lbs. Electro Dynamics—Frame FRAC-405—type XNX — #90398—45 HP—3500 RPM 57/5 amps—45° rise—440/3/60.



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180 GPM — 750 PSI — 590 PSI Steam Liquid Suction 4½" — discharge 3½". Maximum steam pressure 624 lbs. — test pressure 1000 lbs. Water pressure 750 lbs. — water test pressure 1250 lbs.

UNUSED VERTICAL BRONZE PROPELLER-TYPE MAIN CIRCULATING & BILGE PUMPS

DD445 & 692 CLASS

Manufactured by Westinghouse — Warren 25" Vertical Propeller Pump

TURBINE: Type 20VRG-B — 300 HP — 4150 RPM — 575 lbs. — superheat 0° — exhaust pressure 15 lbs. Turbine overspeed 5187 RPM (25%) with reduction gear. PUMP: Warren propeller elbow type — drawing BS6-1618 — Circulator Service 26,500 GPM @ 840 RPM at 13.5 lbs. total head. Bilge Service — 6625 GPM @ 11.5 lbs. — bilge — 144.5 HP — suction lift 13.65" Hg.

UNUSED PROPELLER ELBOW TYPE TURBINE DRIVEN 30,000 GPM WARREN-WESTINGHOUSE CIRCULATING PUMPS

30,000 GPM @ RPM circulating service. Bilge service 7500 GPM @ 460 RPM. Westinghouse drawing 25J119 — serial 5A-1165-4. STEAM TURBINE: 337 HP — 575 lbs. @ 5250 RPM. Weight of unit 10,000 lbs. NSN 4320-00-368-3178

100 GPM U.S.N. DD 692 & 445 CLASS DE LAVAL IMO TURBINE DRIVEN FUEL OIL BOOSTER PUMP

100 GPM 100 PSI. De Laval turbine 575 PSI — 15 lbs back pressure.

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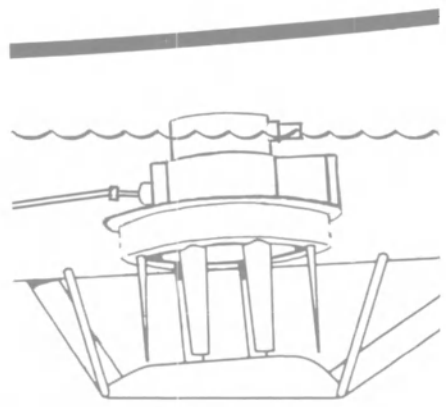
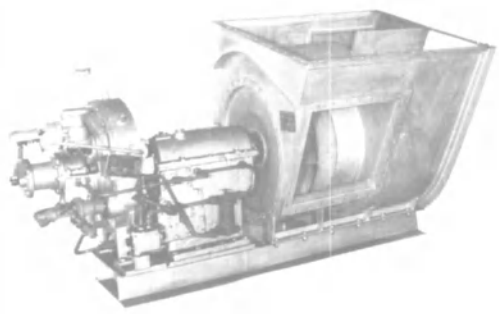


Serial Nos. NR-1783 and NR-1784. Unit size 24/ blade length—2400mm blade orbit diameter. PRI heavy duty motor 800/1000 HP—440/3/60—177 Mfg. by Electric Machinery Co. Complete with ' volts 120 A.C.—line volts 450—amps 941/3/60 HYDRAULIC COUPLING ARRANGEMENT. UNIT E MOTORS FOR BRIDGE CONTROL.

UNUSED EX-U.S. NAVY HORIZONTAL FORCED DRAFT BLOWERS

D.E. 51 CLASS — Mfg. by Westinghouse



21,600/16000 CFM — size 24 — design 3N. Equipped with Sturtevant turbine 6880/5260 RPM — 162 HP — type B-26-6. Working pressure 540 PSI. Typical serial 453L55 — with Sturtevant reduction gear B-26-G — Pinion RPM 5260 — gear 2360 RPM. NSN4141-00-255-9036. Weight 8000 lbs each. Can furnish CW or CCW rotation.

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Diesel Power Review —Paxman Diesel

(continued from page 37)

running with only the snorkel above the surface, when there can be a severe restriction on incoming air and outgoing exhaust gases.

Paxman took full advantage of existing centrifugal compressor technology by using the supercharger rotor and involute from the Napier NA250 turbocharger. The result, according to the company, is an engine with an output similar to the turbocharged engine less the power required to drive the supercharger, but with much greater tolerance of changing inlet depression and exhaust back pressures.

To maintain commonality with the standard Valenta engine, the supercharger drive has been added to the free end of the engine. The drive increases the crankshaft's 1,350 rpm to 24,000 in two stages. Primary speed increase is by epicyclic gears that drive into a fluid coupling before the secondary spur gear stage.

The first engine is undergoing comprehensive testing and has been run at outputs up to 1,518 kW at 1,350 rpm. A second unit is undergoing acceptance tests under submarine conditions at a Ministry of Defence facility.

For further information on Paxman diesel engines,

Write 67 on Reader Service Card

ROLLS-ROYCE

Early next year Rolls-Royce plans to introduce a new 12-cylinder diesel engine, the CV 12, for installation in fast patrol craft and rescue vessels. This engine, in a 60-degree Vee configuration, can deliver 750 bhp at 2,100 rpm, enough power to drive a 50-foot boat at speeds up to 28 knots. Derived from the Rolls-Royce Condor 12V1200 already used in tanks and generating sets, the reliability of the CV 12 has been proven.

The CV 12 has been designed to meet the needs of police and customs all over the world. The engine is also aimed at the search and rescue services.

With a net dry weight of about 4,000 pounds, the CV 12 will have a very favorable power/weight ratio. It will have twin turbocharged, rear-mounted and twin high-mounted camshafts, gear-driven from rear gear trains.

The CV 12 cannot run on heavy fuel and must burn gas oil. But for specialized operations where high speed is essential and time is costly, the new Rolls-Royce engine should find a market.

For further information on Rolls-Royce diesels,

Write 68 on Reader Service Card

SEMT-PIELSTICK

The first cargoships powered by SEMT-Pielstick diesel engines entered service more than 25 years ago and became the forerunners of a fleet that at present aggregates more than 1,000 vessels propelled by the modern PC2-5, PC3, and PC4 versions of the now famous Pielstick design.

During the past year SEMT-Pielstick, along with other marine diesel designers, had to face the second fuel crisis, which had two main consequences: the cost of a ton of fuel increased above $200, and the oil refineries developed new processes and will supply lower quality fuels for marine uses.

To cope with these problems, SEMT-Pielstick concentrated research and development on a decrease in fuel consumption and use of the worst quality fuel. It has developed new engine models with higher cylinder output and, particularly, lower specific fuel consumption. These engines, with the same bore and stroke as their predecessors, have been designed with all the experience already gained with them.

The PC2-6, with bore of 400 mm and stroke of 460 mm, has a maximum continuous rating of 750 bhp per cylinder at 520 rpm, and specific fuel consumption of 136 grams per horsepower-hour at 85 percent of mcr. The PC4-2

(continued on page 42)

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Diesel Power Review —SEMT-Pielstick

(continued from page 40)

has a bore of 570 mm, stroke of 620 mm, and mcr of 1,650 horsepower per cylinder at 400 rpm. This engine has specific fuel consumption of 134 grams per horsepower-hour at 85 percent of mcr.

These two engines are also offered in an economical, derated version. The PC2-6-E has an mcr of 675 horsepower per cylinder at 520 rpm, and specific fuel consumption of 134 grams per horsepower-hour at 85 percent of mcr. The PC4-2-E, with mcr of 1,500 horsepower per cylinder at 400 rpm, has specific fuel consumption of 132 grams per horsepower-hour at 85 percent of mcr. The new engine specifications permit the burning of fuels with gravity lower than 0.99, viscosity of 600 cst at 50 C, and sulphur content of 5 percent.

Another solution is the design of an economical engine room, which can easily be adapted to the particular needs of almost any type ship, thanks to two basic advantages of medium-speed engines: the necessary use of a reduction gear allows the selection of the most economical propeller speed, resulting in a decrease of the propulsion power by about 3 percent for each 10 rpm propeller speed decrease; the heat that can be recovered from a medium-speed engine is some 60 to 70 percent higher than that from a low-speed engine of the same power.

As a consequence, it is possible to supply the full electrical demand at sea on bulk carriers and general cargo ships at service power as low as 8,000 horsepower. Some 15 ships are already equipped with turbogenerators running on steam produced by the exhaust gas energy, without any diesel generator sets operating while at sea.

Super-economical engine room designs make full use of waste heat recovery possibilities. The waste heat can be used for ship's service purposes or for heating condensate water. It can use the calories eliminated in the first stage of the air cooler to create a second stage of steam pressure.

The power of the turbogenerator exceeding the ship's electrical demand can be fed to the propeller, either by mechanical coupling of the steam turbine of the turbogenerator to the gear box through a power take-off, or by the use of a static frequency converter supplying its regulated current to a shaft generator used as a motor.

Such super-economical installations, the first versions of which are already in operation and the second versions under construction, provide a total specific fuel consumption as low as 120 grams per horsepower-hour, operate any given ship with the lowest possible propulsion power, eliminate diesel generator operation at sea, and burn the poorest quality fuel.

For additional information on SEMT-Pielstick engines,

Write 69 on Reader Service Card

STORK-WERKSPOOR

Recent sales developments announced by Dutch engine builder Stork-Werkspoor Diesel b.v. of Amsterdam include three 6-cylinder TM 410 diesels and one 9-cylinder TM 410 ordered by Dutch shipbuilder de Merwede for the dredging company Zanen Verstoep of The Hague. These engines will propel a new cutter dredge, and also drive its sand pumps. Zanen previously used TM 410s to power its cutter dredges Libra and Aquarius. Two 9-cylinder 410s were ordered by IHC-Smit as the main engines for a new hopper dredge due for delivery to Zanen Verstoep next January.

Harlingen, the Dutch shipbuilder, has ordered a 6-cylinder TM 410 engine, with an output of 4,000 bhp at 750 rpm, for Dutch shipowner Kennemerland. This engine will power the biggest deepsea trawler ever built in the Netherlands. The vessel is scheduled for delivery in March 1982.

Stork's latest engine model, the

(continued on page 44)

Diesel Power Review —Stork-Werkspoor

(continued from page 42)

TM 620, has entered service in a number of main propulsion applications. A single V-form, medium-speed TM 620 of only 12 cylinders has an output of 22,000 bhp (16,200 kw).

With fuel consumption such an important factor today, SWD continues to concentrate its research and development efforts in this area. Developments are made constantly on many engine details to reach the best values possible. When first introduced, the TM 620 engine had a fuel rate of 190 grams per kw-hour.

From the beginning, the TM 410 and TM 620 engines were designed and developed to run on heavy fuel. As a consequence, only small adaptations are necessary for the fuels of increasingly inferior quality that are expected to appear on the market in the near future.

For additional information on Stork-Werkspoor engines,

Write 70 on Reader Service Card

SULZER

The modern Sulzer RL crosshead diesel engine range, containing the RL 56, RL 66, RL 76, and RL 90, is now complete. This completes the development of a loop-scavenged, low-speed engine series under very largely changed conditions, where the priorities have been dominated by fuel economy and fuel quality aspects.

In the past, the development of two-stroke diesel engines has had two major priority aspects: increase in power and improvement of reliability. During the design evolution of the past 20 years, the output of the Sulzer low-speed engine was increased by 74 percent and, despite a large increase in firing pressures of approximately 55 percent, the reliability was improved substantially as a result of unprecedented development efforts.

The oil crisis in 1973 had a tremendous impact on the philosophy of engine design and development. The relative weight of fuel and lube oil cost out of the total cost has taken such a large share that it is only logical that economical aspects are now predominant criteria for the engine designer.

Major features of the RL type engine include: new type of turbocharger with increased efficiency and pressure ratio range; foundation bolts arranged in one row on the outside; bedplate with integrated thrustblock; single columns; one-piece gear column; simplified scavenge air receiver; one-piece, bore-cooled cylinder cover with eight bolts; bore-cooled (water) piston crown; bore-cooled cylinder liner; enlarged crosshead pin with improved lube-oil feeding system; integrated balancer for 4-, 5-, and 6-cylinder engines (optional); PUP cancel valve (piston underside); and modified fuel injection system with standard variable injection timing mechanism.

The impact of the changed priorities as a result of sharply increased fuel cost on the design of the RL series was very strong. Overall economy is now exploited on a much larger scale than hitherto, and waste heat recovery is an important aspect. As a result of outstanding development efforts, the fuel consumption rates of the loop-scavenged crosshead engine are now extremely low and quite competitive with other systems.

Reliability and simplicity, combined with optimum suitability for low-quality fuel, are the basic assets of this type of engine and will continue to be an extremely important aspect for marine propulsion machinery.

Claim was recently laid to probably one of the lowest specific fuel consumption rates for any long-stroke diesel engine built in series. A 4-cylinder Sulzer RLA 90 engine—converted to the RLB specification — is said to be the first such engine to break the 130 gram fuel barrier. With a specific fuel consumption of 129.1

(continued on page 47)

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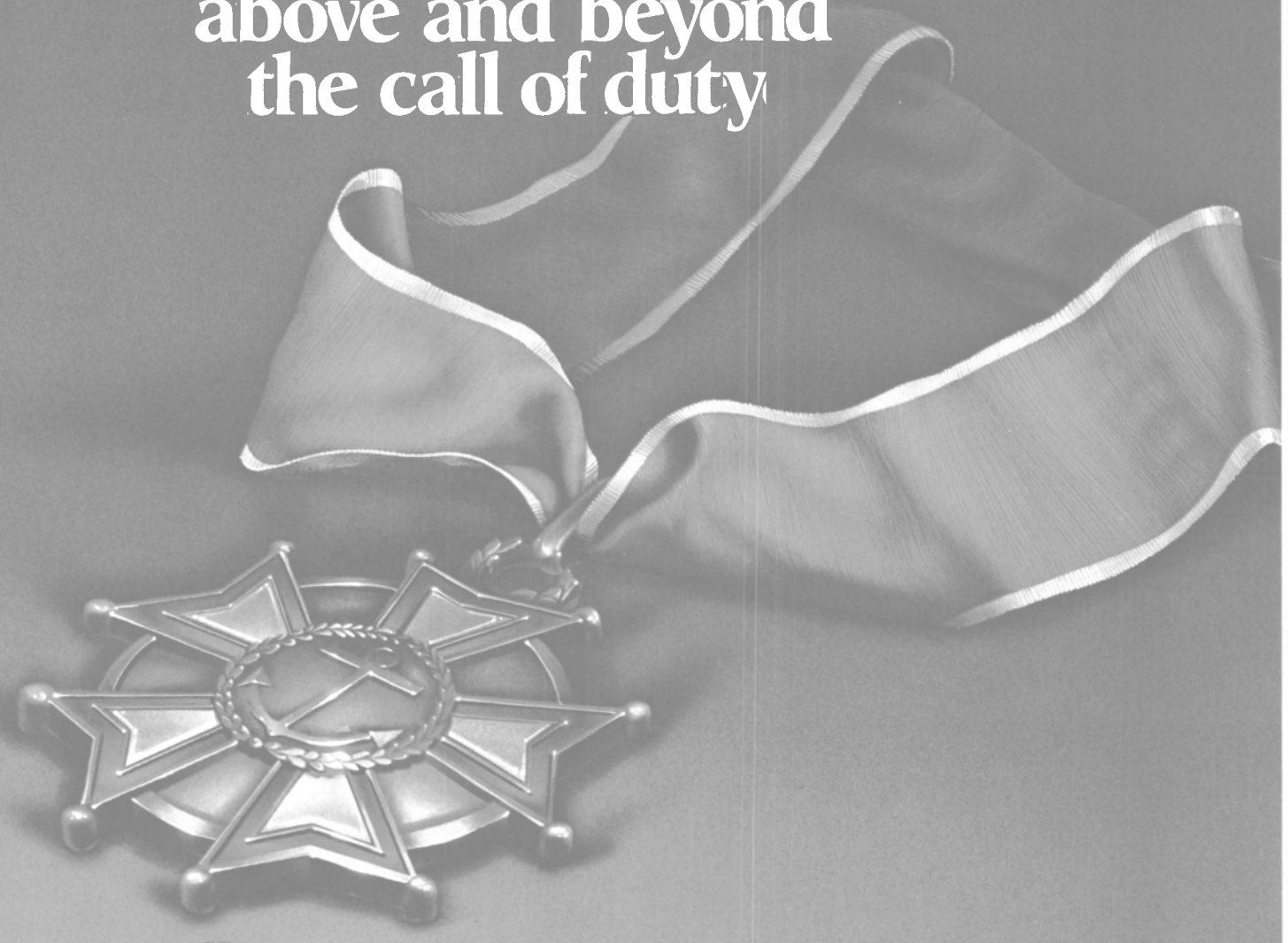

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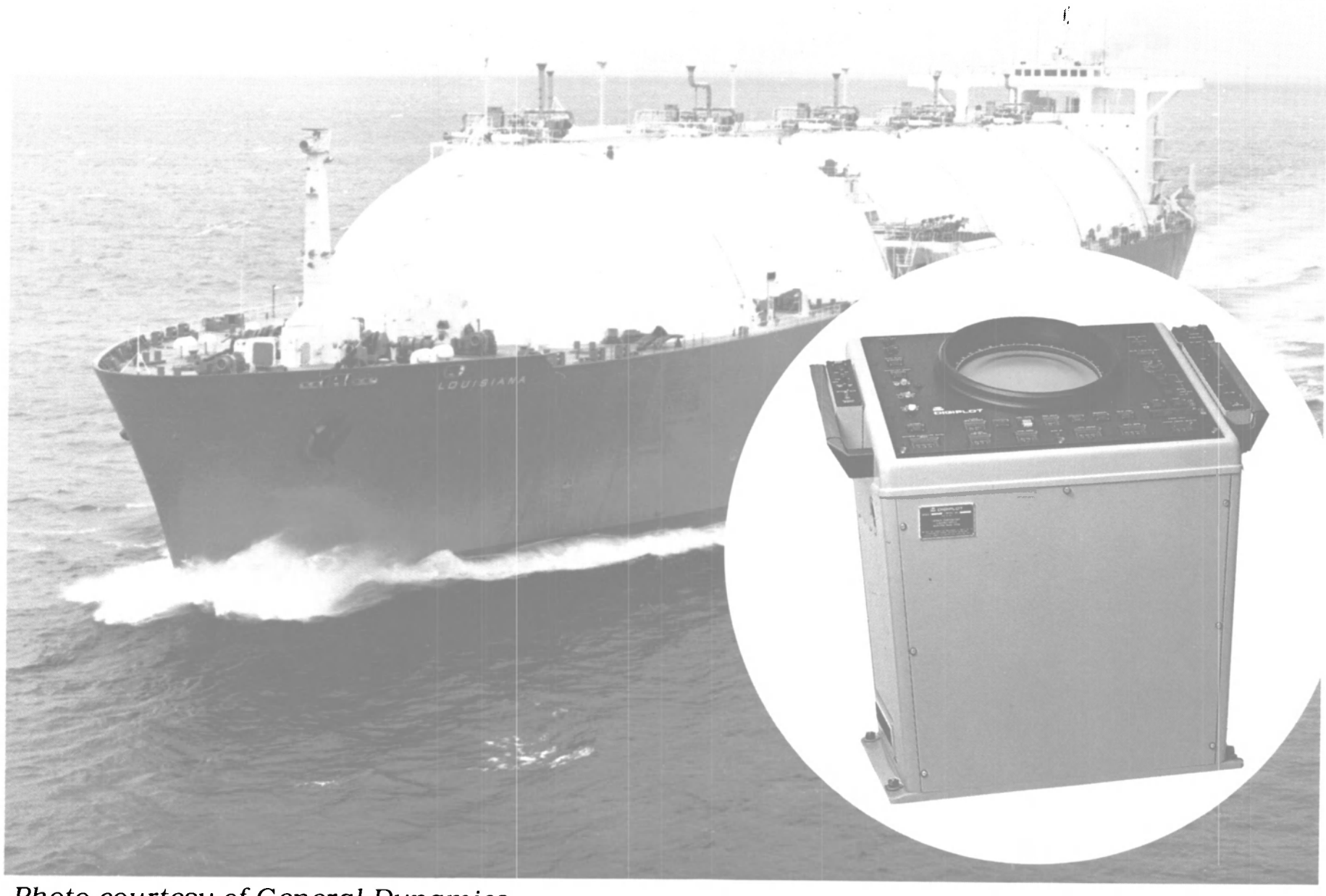

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Diesel Power Review —Sulzer

(continued from page 44)

grams per horsepower-hour, or nearly 3 grams under the guaranteed fuel rate for this series, this crosshead engine built by Sumitoma Heavy Industries in Japan has a maximum continuous rating of 13,600 bhp at 90 rpm.

In its continuous effort to meet all the stringent future demands imposed on diesel engines for both marine and stationary purposes, Sulzer has now further developed its highly successful series of Z 40 medium-speed engines.

All the well-proven inherent advantages of the Z 40 engine design have been incorporated in the new engine, and maximum use has been made of the experience gained from the considerable number of service hours with heavy fuel. The outcome of this development is the ZA 40, one of the most technologically advanced, medium-speed engines on the market. Among other things, this design offers a greatly reduced specific fuel consumption, a better capability to burn low-quality fuels, a highly efficient and economical cylinder lubrication, a greater potential for efficient waste heat recovery, facilitated maintenance, and an increased output.

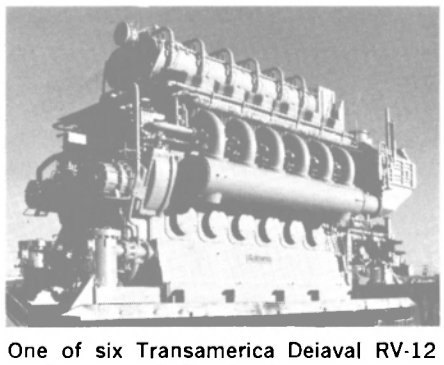
For additional information about these and other Sulzer diesel engines,

Write 71 on Reader Service Card

TRANSAMERICA DELAVAL

Transamerica Delaval Enterprise R and RV medium-speed diesel engines operate in the range through 450 rpm, developing from 3,300 to more than 13,000 bhp at a bmep of 250 psig. The R and RV series is composed of 6- and 8-cylinder in-line engines, and Vee-form engines with 12, 16, or 20 cylinders. The bore is 17 inches (432 mm), the stroke is 21 inches (533 mm), and the output range reaches up to 677 bhp per cylinder.

An agreement signed recently with the Dutch firm of Stork-Werkspoor Diesel B.V. of Amsterdam gives Delaval the rights to the exclusive manufacture and marketing of the Enterprise/SWD TM 620 diesel. This engine, which operates up to 425 rpm, is offered as a 9-cylinder in-line unit with an output of 16,000 bhp at the flywheel, and a Vee type 12-cylinder unit rated at 21,700 bhp. The Vee type, rated at 1,800 bhp per cylinder, is soon to be rated at 2,000 bhp, giving it the highest medium-speed horsepower per cylinder rating in the world.



One of six Transamerica Delaval RV-12 medium speed diesels chosen to power three 'Lone Star Class' 36,000 dwt dry bulk cargo ships.

Recent installations reinforce Delaval's reputation as a leader in the marine power field. Four Enterprise RV-16 diesels will power two 35,000-dwt tankers being built by Bath Iron Works for Falcon I Sea Transport Company. The owner will charter the 666-foot vessels to the Military Sealift Command for transporting fuels to government bases worldwide. The RV-16s, each rated at 7,360 bhp, are designed to operate on various fuels including the more economical grades with viscosities up to 3500 Redwood.

The 36,000-dwt Pride of Texas, first of three dry bulk carriers being built by Levingston Shipbuilding Company in Orange, Texas, for Asco Falcon I, is powered by twin Enterprise RV-12 direct-reversing engines giving the ship a total of 15,600 bhp. The two sister ships will be similarly powered.

(continued on page 48)

Diesel Power Review —Transamerica Delaval

(continued from page 47)

Delaval RV-16 diesels were the choice to power six 47,000-dwt Catug petroleum carriers. The barges are being built by Bethlehem Steel's Sparrows Point yard, and subcontractor Halter Marine of New Orleans is building the tugs. Each tug-barge unit is powered by twin direct-reversing diesels, each engine rated at 9,100 bhp.

Twin Delaval RV-16 engines propel U.S. Steel's 1,000-foot ore carrier, the Edwin H. Gott. A recent inspection of the main propulsion engines after the Gott's second year of service provided an opportunity to assess RV-16 durability after burning heavy fuel for 10,000 hours of service, two-thirds of that time at full power. According to the inspecting engineers' reports, pistons, cylinders, and cylinder heads showed very low wear rates; ash deposits were minimal, and internals of the engine were described as "exceptionally clean."

A contract to supply ship service diesel generators for three American President Lines containerships under construction at Avondale Shipyards in New Orleans marks Delaval's entry into the important auxiliary marine power area. The 860-foot vessels each will be equipped with three Delaval 2,500-kw DMR46, in-line medium-speed diesels, fully prepackaged with generators and auxiliaries. Compatability with heavy fuels, long a Delaval feature in its traditional role as builder of main propulsion units, was a key criterion in the engine's selection for auxiliary power.

For additional information on Delaval Enterprise engines,

Write 72 on Reader Service Card

VOLVO PENTA

Volvo Penta's line of diesels for commercial use consist of 2-, 3-, 4-, and 6-cylinder engines covering 12 different models. Some models are equipped with turbochargers and others with both turbo and after-coolers. Most are available with marine society certifications.

Additionally, Volvo Penta offers twin engines driving through a compound gear providing a single shaft output from 336 shp to 580 shp. The twin engine/single output package provides many advantages including "take-home" capability on one engine.

A wide range of accessories designed for commercial use are available. Work-saving accessory items include front or side mounted power take-offs, flexible engine mounts and shaft couplings, freshwater filters, auxiliary alternators, engine-mounted pumps, and many more.

The heavy-duty Volvo line includes the model MD 120A, a 6-cylinder engine with maximum continuous rating of 168 shp at 1,800 rpm; the 6-cylinder TMD 120A with mcr of 260 shp at 1,800 rpm; and the 6-cylinder TAMD 120B with mcr of 328 shp at 1,800 rpm.

For additional information on Volvo Penta marine diesels,

Write 73 on Reader Service Card

WARTSILA/NOHAB

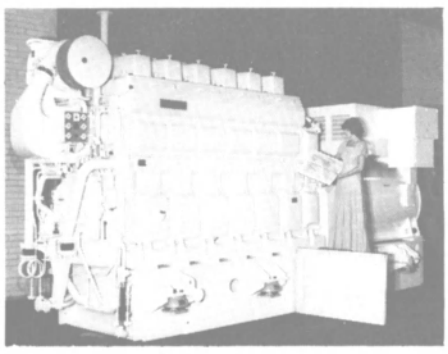
The Diesel Division of OY Wartsila A.B., Finland, comprises the Wartsila Vasa Factory in Finland and Nohab Diesel A.B. in Sweden. Its Nohab and Vasa engines are medium-speed, four-cycle diesels with an output range from 690 bhp to 8,250 bhp.

Wartsila has a long tradition in the design, development, and manufacturing of diesel engines. Due to the company's comprehensive product development, Wartsila engines already meet the requirements of the future in regard to burning low-grade fuel, good fuel consumption rates, and excellent service economy.

The Wartsila engine line includes the following:

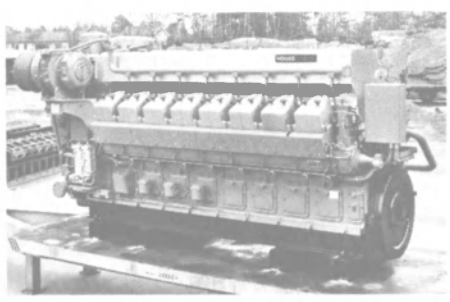
The Vasa 32, with 12.60-inch bore and 13.78-inch stroke, is

manufactured as in-line and V-type versions with outputs ranging from 1,790 to 8,250 bhp. The Vasa 22HF engine, with 8.66-inch bore and 9.45-inch stroke, is offered in 4-, 6-, and 8-cylinder in-line versions and in 12- and 16-cylinder V-type configurations, with outputs of 710 to 3,410 bhp. The Nohab F30 type engine, with 9.84-inch bore and 11.81-inch stroke, is manufactured in 12- and 16-cylinder V-type versions; output range is from 1,745 to 4,025 bhp. The Vasa 24 type engine with outputs from 690 to 1,460 bhp is also available.



A Vasa 6R32 generating set.

The Vasa 32 and 22 type engines were designed and developed to operate on heavy fuel up to 380 cSt, whereas the Nohab F30 can accommodate fuel with a viscosity of 180 cSt.



The Nohab F316.

Among the applications for Wartsila diesels are main engines in ships for both geared and diesel-electric propulsion, auxiliary engines for vessels, and generator systems for stationary power plants. The Vasa 32 provides an excellent combination as both main and auxiliary engine in the same ship, such as in car/passenger ferries. This provides simplified maintenance routines and the advantage that all the engines can be operated on bunker oil.

The Nohab F30 is widely used in offshore vessels, and more than one million bhp is presently in operation on such vessels and on oil rigs.

The Wartsila Diesel Division recently set up a completely new engine factory in Singapore, in partnership with Keppel Shipyard. To be known as Wartsila Power Singapore, its principal product will be the Vasa 22HF engine family. Wartsila Diesel also has a wide network of its own representatives, agents, and service stations all over the world. In the U.S., sales are handled by Wartsila Power, Inc., Marrero (New Orleans) and the West Coast branch, Wartsila Power Seattle, Inc. Wartsila Power, Inc. provides 24-hour parts and service from its workshop/office in Marrero.

For additional information on Wartsila's Vasa and Nohab engines,

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WAUKESHA ENGINE

Waukesha Engine Division of Dresser Industries announced this year that it will manufacture a new family of large-bore marine diesel engines under a license from Sulzer Brothers Limited of Winterthur, Switzerland. The new engines, scheduled for production in 1982, will be called the AT25 series. They are rated from 1,230 to 4,320 maximum continuous bhp (985 to 3,223 kw) for propulsion and up to 3,040 kilowatts for ship's service electric sets at 1,000 rpm.

Available in four basic models —6- and 8-cylinder in-line and 12- and 16-cylinder Vee versions — the AT25 series engines will have a bore of 250 mm and stroke of 300 mm (9.84 by 11.8 inches) and are capable of operating on heavy fuel.

The V-16 model 16V-AT25 has maximum continuous ratings of 4,320 bhp at 1,000 rpm, 4,000 bhp at 900 rpm, and 3,520 bhp at 750 rpm. Its ship's service electrical

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Diesel Power Review —Waukesha Engine

(continued from page 49)

ratings include 2,800 kw, 60 Hz at 900 rpm, and 3,040 kw, 50 Hz at 1,000 rpm. Maximum continuous ratings of the V-12 model 12V-AT25 include 3,240 bhp at 1,000 rpm, 3,000 bhp at 900 rpm, and 2,640 bhp at 750 rpm, with ship's service ratings of 2,100 kw, 60 Hz at 900 rpm, and 2,280 kw, 50 Hz at 1,000 rpm.

The in-line, 8-cylinder model 8L-AT25 has maximum continuous ratings of 2,160 bhp at 1,000 rpm, 2,000 bhp at 900 rpm, and 1,760 bhp at 750 rpm. Ship's service ratings include 1,400 kw, 60 Hz at 900 rpm, and 1,520 kw, 50 Hz at 1,000 rpm.

The smallest in the family, the in-line, 6-cylinder model 6L-AT25 has maximum continuous ratings of 1,620 bhp at 1,000 rpm, 1,500 bhp at 900 rpm, and 1,320 bhp at 750 rpm. Ship's service ratings are 1,050 kw, 60 Hz at 900 rpm, and 1,140 kw, 50 Hz at 1,000 rpm.

Design features include rigid, one-piece cast crankcase and cylinder block with underslung crankshaft for greater stiffness. Bore-cooled cylinder heads with water-cooled valve seats permit operation on heavy fuels. The application of pulse type turbocharging provides excellent performance and fuel economy at part or full load.

In addition to the AT25 series, Waukesha offers two other families of engines. Its VHP marine diesels are the result of a 10-year design program to provide a reliable, high-performance engine for workboats and fishing trawlers in the intermediate horsepower range. Outputs range from 416 to 1,636 continuous bhp (310 to 1,220 kw) at 1,215 rpm.

Complementing the AT25 and VHP lines are the smaller mid-range VS series marine diesels. They are rated up to 348 continuous bhp (260 kw) at 1,900 rpm for propulsion and 235 kw at 1,800 rpm in ship's service generator sets.

For additional information on Waukesha marine diesel engines,

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WICHMANN DIESEL

From a modest family-owned operation founded in 1903, the Wichmann firm has expanded continually, and today its plant is said to be one of the most modern in the world. The company's U.S. manufacturing facility is located in Kenner, La. near New Orleans.

During its first 30 years of operation, Wichmann built two-stroke semi-diesel engines, then switched to two-stroke, full-compression ignition engine production around 1935. Since that time, the company has produced several engine models, increasing its size and horsepower range with each model change.

In the late 1960s, Wichmann introduced the AX and AXG series of in-line engines, which were forerunners to the current engine type, the AXA and the AXAG. The AXA engines are coupled directly to the propeller shaft through an integral hydraulic clutch, as these engines have a relatively low speed of 375 rpm. The AXAG engines operate at higher speeds, 475 rpm, and are normally equipped with reduction gears that are available with an infinite number of ratios. The output of the AXA and AXAG models ranges from 1,350 to 4,000 bhp, and engine configurations range from four to 10 cylinders.

All Wichmann engines are of a simple single-acting, two-stroke cycle, liquid-cooled design, and all are turbocharged, intercooled, loop-scavenged, and direct-injected. The scavenging process is timed by inlet and outlet ports in the cylinder liners, so there are no valves or valve-operating mechanisms. All major components are of modular construction. Accessories are driven by

gear trains located at both ends of the engine.

This design provides a sturdy, reliable engine that requires a minimum of maintenance and is simple to repair. For example, the removal of four nuts permits removal of a cylinder head. The absence of valves and the valve train eliminates one of the major causes of diesel engine failure.

Overall, experience has shown that the ratio of operating hours to maintenance hours is higher and economical for the operator. Complete interchangeability of parts between engine types and a smaller onboard inventory of spares reduces maintenance support problems and storage requirements, which frees operating capital. With fewer moving parts and low engine speeds, engine wear is said to be reduced substantially, and lube oil lift extended. In other areas of economy, fuel utilization is said to be extremely low — one of the primary application considerations today — and intermediate fuels have always been available in Wichmann systems as a viable alternative to marine diesel oil.

Considerable research, development, testing, and evaluation have resulted in an engine design that provides one of the lowest fuel consumptions in the world, specifically, 0.3417 pounds per bhp hour. This translates into approximately 0.046 gallons per bhp hour. In practice, the Wichmann 4AXA, which is rated at 1,350 bhp, would consume approximately 63 gallons per hour at full load.

It is common practice today, however, to purchase a propulsion system that provides approximately 120 percent of the required load, permitting the system to be operated at 80 percent load. This reduced loading enables the engine to be operated in the optimum portion of the fuel consumption curve.

Functionally, the Wichman scavenging system, low engine speed, and long stroke provide this increased fuel efficiency, which also results in a more uniform and complete combustion process, utilizing all of the fuel that is injected for the propulsion of power rather than smoke generation. This also minimizes carbon deposits, especially in intermediate fuel applications.

In the near future, a Wichmann V engine will become part of the engine family. The V engine is now in the final stages of test and evaluation. When production models are available, the engine series will provide a power range of from 1,800 to 4,800 bhp, with configurations from six to 16 cylinders.

For additional data and free literature on Wichmann engines,

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Halter To Build Two Supply Vessels For Jackson Marine

Halter Marine, Inc., New Orleans, La., and Jackson Marine Corp., Aransas Pass, Texas, have signed a contract for the construction of two 180-foot supply boats. The new vessels will be the 48th and 49th to be built by Halter for Jackson.

The two companies began their association in 1967 with the construction and delivery of the 100-foot tug Captain Jac. Since then Halter has built 33 tugs, 13 supply boats, and one crewboat for the Texas-based vessel operator.

The new vessels will each be 180 feet long, with a 40-foot beam, and 14-foot depth. Each will be powered by two Caterpillar D-399 engines developing 1,125 hp each at 1,225 rpm.

Each will be equipped to carry 4,000 cubic feet of bulk mud and 1,660 barrels of liquid mud. In addition, both will be able to fight off-ship fires and both will be equipped with a foam and chemical dispersant system. Delivery is scheduled for the summer of 1982.

The supply boats will be built at Halter's Calumet, La., division, one of a group of shipyards owned and operated by Halter in the Southeastern U.S.

Canadian Firm Orders Four Large Bulk Carriers

Federal Commerce and Navigation Ltd., Montreal, Canada, has placed orders with shipyards in South Korea and Belgium for four 138,000-dwt bulk carriers intended for the coal trade.

According to **Michael Bell**, senior vice president, the bulk carriers are being built, two each, at Hyundai Shipbuilding Company, Ulsan, Korea, and at Cockerill Yards Hoboken N.V., Belgium, at a cost of $180 million (Canadian).

The ships will have a box configuration of the hull to maximize carrying capacity with a shallow draft of about 50 feet, fully loaded. The four ships will be powered by B&W slow-speed diesel engines.

Delivery from the Korean yard is expected at the end of 1981 and March of 1982. April of 1982 and the first quarter of 1983 are the anticipated delivery times for the Belgian yards.

Seaward International Awarded Fourth Fender Contract By U.S. Navy

Seaward International, Inc., Falls Church, Va., is supplying an additional 1,342 small 2- by 3-foot Sea Cushion® fenders to the U.S. Navy. This new contract, valued at over $600,000, is Seaward's fourth contract since 1978 to supply small Navy fenders.

The fenders were procured under new specifications for fenders that are lighter in weight and provide higher performance than the old style Navy fenders. This new specification is based on the proven design of Seaward's Sea Cushion fenders that are commercially available worldwide. Procured under the same stock number as the old style Navy fenders, 1H 2040-00-807-4197, these new 70-pound fenders can be handled by one man and are non-marking gray in color.

Under the current contract, the Navy requires delivery of 100 fenders per month. Seaward has been way ahead of schedule since it began delivery in July and 817 fenders have been delivered to date. The Navy has the option to double the quantity under this contract.

Seaward International has supplied fenders to the Navy ranging in size from 16 by 36 inches to 8 by 16 feet. When the current contract expires in November 1982, Seaward will have delivered over 3,960 fenders to the Navy.

Ashland Oil Will Use Megasystems D.O.T. Unit To Evaluate Additives

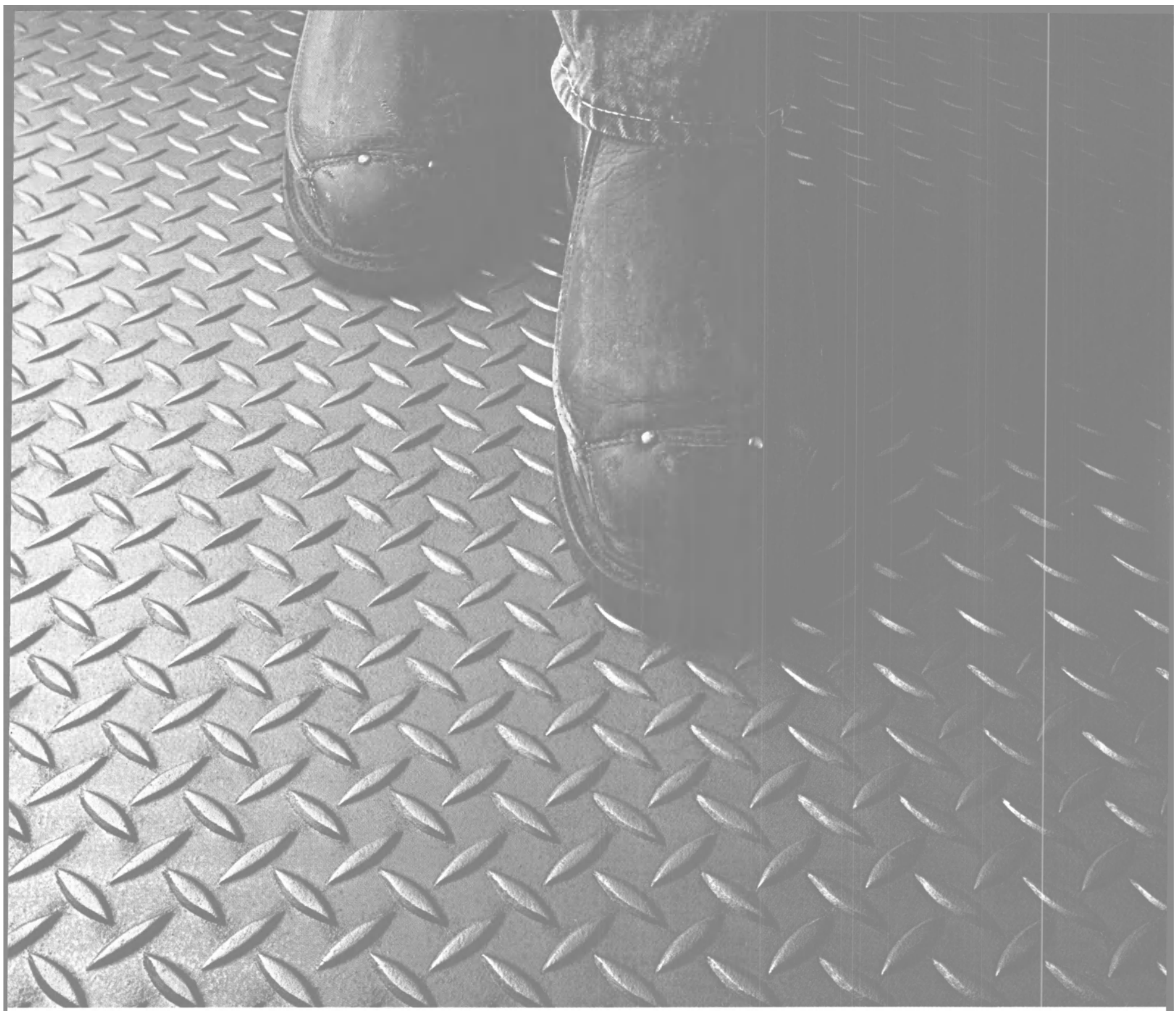
Ashland Oil Company of Ashland, Ky., recently purchased the new Direct Optical Tuning (D.O.T.) diesel combustion analysis system from Megasystems, Inc. of Boca Raton, Fla., and Cleveland, Ohio. The latest product in Megasystems' line of sophisticated engine monitoring and control equipment, the D.O.T. system features video and digital displays and simplified controls in one small package. This unit utilizes the latest design of integrated microelectronics to provide simplified state-of-the-art operation and reliability.

The D.O.T. unit purchased by Ashland, which will be used in the laboratory to monitor the performance of fuel oil additives to see what effect they have on the combustion process, includes a line printer and printer interface microprocessor.

For additional information on Megasystems' Direct Optical Tuning system,

Write 11 on Reader Service Card

◄ **Write 501 on Reader Service Card**



People are stepping all over us.

Indoors or out, in fair weather or foul, they keep right on walking all over us. But we like it that way. And so do they. Because what they're walking on is our Sure-Foot™ safety plate.

Rolled from Lukens quality plate steel, Sure-Foot™ features an attractive pattern of sharp, clearly-defined projections that resist slippage. And it's easy to match and to keep clean.

The combination of this design and Lukens quality plate steel has never been available before. Put them together and you've got a winning combination that's great for heavy traffic walkways, stairs, docks, ramps, work tables, truck floors, tailgates and kickplates.

The Lukens quality plate steel gives you the strength and support you need, with a sharp, skid-resistant pattern that could be a real life-saver in a lot of applications.

If you haven't already done so, ask your local Service Center about the many sizes and thicknesses available in Sure-Foot™ safety plate.

Or contact your nearest Lukens sales office for further information.

LUKENS STEEL

Lukens Steel

Coatesville, PA 19320

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CALENDAR OF COMING EVENTS

Extreme Loads Response Symposium **Oct. 19-20**

Presented by the Ship Structure Committee and The Society of Naval Architects and Marine Engineers.

Sheraton National Hotel, Arlington, Va. Contact Comdr. **James A. Sanial,** registration chairman, ELRS, U.S. Coast Guard Headquarters (G-DMT-1 54), Washington, D.C. 20593.

Gastech 81: 8th International LNG/LPG Conference & Exhibition Oct. 20-23

Organized by Business Meetings Limited.

Congress Centrum, Hamburg, Federal Republic of Germany. Contact Gastech Secretariat, 2 Station Road, Rickmansworth, Herts WD3 1QP, England; 09237 76363, telex 924312. (Preview in October 1 issue of MR/EN)

Combat Systems Symposium Oct. 21-22

Sponsored by the Chief of Naval Materials; Chief of Naval Research; and the Commanders of the Naval Air, Electronics and Sea Systems Commands in cooperation with ASNE.

Mahan Hall, U.S. Naval Academy, Annapolis, Md. Contact American Society of Naval Engineers, 1012 14th St. N.W., Washington, D.C. 20005; (202) 737-0757.

Fishing Industry Energy Conservation Conference Oct. 26-27

Organized by SNAME Fishing Systems Panel. Sponsored by National Marine Fisheries Service.

Park Hilton Hotel, Seattle, Wash. Contact **David F. Smith.** Registration Chairman, P.O. Box 297, Seahurst, Wash. 98062.

Europort Exhibition and Congress Nov. 11-14

Sponsored by the Europort Organization, RAI Halls, Amsterdam, the Netherlands.

Contact: **Peter K. Johnson,** Europort, 6006 Bellaire Blvd., Suite 100, Houston, Texas 77081; (713) 666-5188, telex 910 881 5777.

International Issues Day Nov. 16

Sponsored by The Maritime Association of the Port of New York.

N.Y. City Passenger Ship Terminal, New York City. Contact **Gary McIsaac,** ISOSO-1981, 34th Floor, 80 Broad St., New York, N.Y. 10004; (212) 425-5704, telex 12 6808 Maritime NYK.

International Symposium on Ship Operations (ISOSO) '81 Nov. 17-19

Sponsored by The Maritime Assoc. of the Port of New York, American Institute of Merchant Shipping, Council of American Flag Ship Operators, The Hydrographic Society and the Council of American Master Mariners.

N.Y. City, Passenger Ship Terminal, New York City. Contact **Gary McIsaac,** ISOSO-1981. 34th Floor, 80 Broad Street, New York, N.Y. 10004; (212) 425-5704; telex 12 6808 Maritime NYK.

89th Annual Meeting of The Society of Naval Architects and Marine Engineers Nov. 18-21

Sponsored by The Society of Naval Architects and Marine Engineers.

Hilton Hotel, New York, N.Y. Contact **Trevor Lewis-Jones,** SNAME, One World Trade Center, Suite 1369, New York, N.Y. 10048; (212) 432-0310.

$28-Million Navy Sonar Contract Awarded Raytheon

Raytheon Company Submarine Signal Division, Portsmouth, R.I., has been awarded a $28,400,000 firm fixed price contract for AN/BQQ-5 transmit subsystems plus refurbished AN/BQS 11-12-13 subsystems and modification kits to be incorporated into the AN/BQQ-5 sonar. The Naval Sea Systems Command is the contracting agent.

Award $7.4-Million Navy Contract To Todd For Overhaul Of USS Camden

Todd Shipyards Corporation, Alameda, Calif., has been awarded a $7,427,340 firm fixed price contract for Lot I of the regularly scheduled overhaul of the USS Camden (AOE-2). Lot I is the drydock portion of the overhaul. The Supervisor of Shipbuilding Conversion and Repair, USN, San Francisco, is the contracting agency.

Award $3-Million Fire Pump Contract To Peabody

Peabody Barnes, Mansfield, Ohio, has been awarded a $3,165,-314 firm fixed price contract for the furnishing of 787 PE250 fire pumps. The U.S. Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity.

Dorbyl Building Four Schottel Rudder-Propeller Tugs

The Schottel Group of Companies, Spay/Rhine, Germany, has received an order to supply eight rudder-propellers for four tractor tugs building in South Africa.

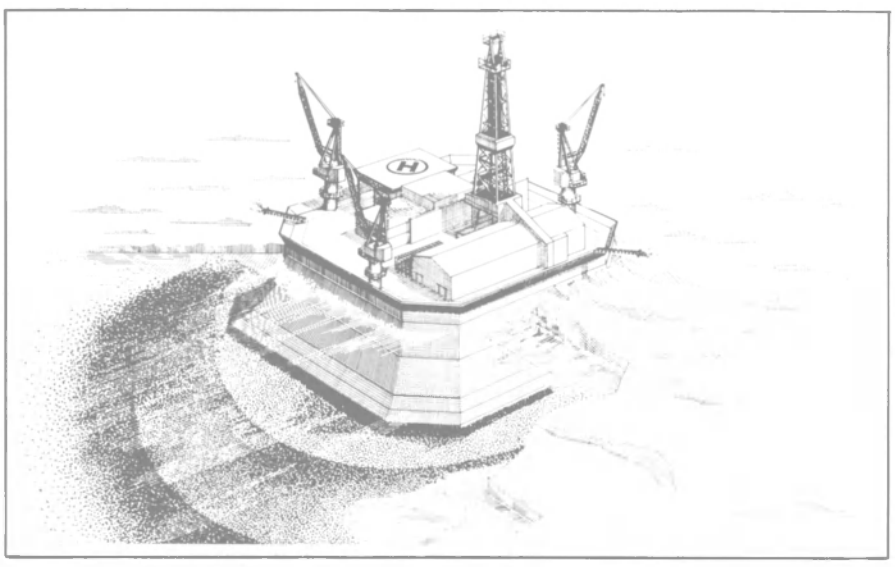
The twin-screw tugs are being built for South African Railways, Johannesburg, by Dorbyl Marine, Durban, and are scheduled to be delivered in mid-1982 and early 1983. Two of the tugs will serve in the Port of Durban and the others in East London.

SOUTH AFRICAN R.R. TUGS

Length overall	107′
Beam	31′
Depth	13½′
Draft	19′
Displacement (approx.)	500 tons
Bollard Pull	40 tons
Power	(2) MAK Diesel engines type 6M332, each developing 1,100 kw (1,500 hp) at 850 rpm
Propulsion	(2) Schottel-Rudder-propellers type SRP 1100/1100
Gear reduction	4.12:1
Speed	12 knots
Propeller diameter	2,400 mm in nozzles
Class	Lloyd's Register of Shipping

Silhouette of the four Schottel-Rudder-propeller equipped tugs ordered by the South African Railways (S.A.R.), Johannesburg.

IHI To Build World's First Mobile Arctic Caisson Rig For Beaufort Sea



An artist's conception of the mobile Arctic caisson rig.

Ishikawajima-Harima Heavy Industries Co., Ltd., jointly with Mitsui & Co., Ltd., both of Japan, recently received an order for a mobile Arctic caisson rig, the first of its kind in the world, from Gulf Canada Resources Inc., a group company of Gulf Oil of the USA. The contract was concluded recently between the parties concerned in Canada.

The steel caisson rig, to be used for oil development in the Arctic Ocean, will measure 111 by 111 meters (364 by 364 feet) in the lower section, 86.6 by 86.6 meters (284 by 284 feet) in the upper section, and 29 meters (95 feet) in height, and have a working water depth of 21 meters (69 feet). The total weight will be about 33,000 tons.

To be built at IHI's Aichi Works, the huge caisson rig will be delivered toward the end of March 1984 and then towed to the Arctic Ocean.

The drilling rig will be used for the oil development now being conducted in the Canadian Beaufort Sea by Gulf Canada Resources Inc. Conventional type oil drilling rigs cannot be used in the Arctic Ocean because of severe problems with solid and drift ice. As a result, the usual method has been to install rigs on artificial islands constructed of earth or sand. This method requires that a new artificial island be constructed in the harsh working environment every time the drilling point is changed.

The new mobile Arctic caisson rig can be seated on a simple foundation built in the sea. When drilling at any point is completed, the rig is floated and moved to the next drilling point, as in the case of conventional rigs.

George Engine Reports Record Growth-Sales —Brochure Available

George Engine Company, Inc., of Harvey, La., is an organization that started a little over 35 years ago with a $2,500 investment and has grown into one of the world's largest distributors of Detroit Diesel marine engines.

The company is named for its late founder, **George S. Frierson Jr.**, who secured a franchise in 1945 from the General Motors Corporation through a combination of personality, business acumen, and old-fashioned luck. Mr. **Frierson's** son, **Louis**, now serves as chairman, president and general manager.

The company's new Harvey headquarters facility encompasses a quarter of a million square feet, making GECO one of the biggest installations of its kind in the U.S. In addition, the company operates wholly owned branches in Lafayette, Morgan City, and Baton Rouge, and has acquired property for building additional branches in other key areas.

The company's franchised dealers, of whom there are more than 70, are located in nearly every important township and city throughout South Louisiana. Sales to the maritime industry account for well over half of GECO's entire business, which will exceed gross sales of $140 million in 1981.

The original "Jimmy Diesels" sold by GECO were used for powering shrimp trawlers and oyster luggers. While commercial fishermen still account for a sizeable share of business, the company's major interest today lies with the offshore petroleum industry.

George Engine was part of the development of much of the equipment used for transporting machinery, supplies and personnel to offshore drilling and production sites. In the process, the company has supplied tens of thousands of marine engines and more than 1,500 complete boat "packages." The concept of selling and financing complete workboats originated with GECO and is widely accepted in the oil and towing industries.

GECO also furnished the engines used to power the world's first all-steel crewboat. Some years later, it did the same with the first all-aluminum crewboat that is still in service on Venezuela's Lake Maracaibo. The company also powered and financed the industry's first "bo-truck," then a radical new design for workboats, featuring a wheelhouse fully forward and a large afterdeck suited for carrying bulky oilfield cargo.

In January 1980, George Engine added ALCO Power Boss engines to its product line, giving the company the ability to power the biggest workboats including long-range towing/supply vessels, tugs, towboats, and other equipment used both offshore and on the inland waterways.

A sizeable portion of GECO's main plant is devoted to assembling generator sets for the marine industry.

In addition to its commercial work, GECO has furnished engines and generators for hundreds of patrol boats and a number of experimental vessels built for the military.

For a brochure on George Engine Co. capabilities,

Write 12 on Reader Service Card

DOT Approves License For Deepwater Oil Port Offshore Texas

A license for Texas Offshore Port Inc. to construct and operate a deepwater port for oil supertankers in the Gulf of Mexico has been approved by the federal Department of Transportation.

The port, to be located 12 miles south of Freeport, Texas, will be able to handle 500,000 barrels of oil a day and will cost an estimated $191 million.

Texas Offshore Port Inc., a consortium of potential users — oil and chemical companies—applied for the license which guarantees that the facility be operated as a common carrier.

The DOT said that according to conditions recommended by the Justice Department and the Federal Trade Commission, the port will be subject to antitrust laws.

Transportation Secretary **Drew Lewis,** in a statement released recently, said the new port will lower the cost of transporting crude oil and significantly reduce the risk of oil spills.

Award $33-Million Contract To Great Lakes Dredge For Work In Kenya

Great Lakes Dredge and Dock Company, Oak Brook, Ill., has been awarded a $33,386,751 fixed price contract for the dredging of Kilindini Harbor, Mombasa, Kenya, including an option for additional work in the amount of $5,871,514, following competition in which six bids were received. The Naval Facilities Engineering Command, Atlantic Division, is the contracting activity. (N62470-81-C-1158)

$3-Million Navy Contract Awarded To Tracor

Tracor, Inc., Austin, Texas, has received a $3-million contract from the U.S. Navy for systems engineering and technical services to the Naval Ocean Systems Center, San Diego, Calif., **William C. Moyer,** group vice president for Tracor Applied Sciences, announced recently. Work will be in support of the minimal essential naval communications and navigation system design, development, test, and evaluation.

Dr. **Moyer** said the contract, which includes two option years, involves design analysis, system design engineering, electronic countermeasures (ECM) system vulnerability assessment, system integration, configuration control, test bed design, software design, and test and evaluation.

The Naval Ocean Systems Center, Dr. **Moyer** said, is a leading technical arm of the Navy devoting its resources to a wide range of activities, including communications, navigation, and underwater acoustics. Tracor has been a major technical consultant to the U.S. Navy for more than 26 years. Work will be conducted at Tracor facilities in San Diego and Torrance, Calif. **Robert G. Shuster,** division vice president of the Electronics Systems Division, will oversee the contract work and has assigned **Ara Sagerian** as program manager.

New Brochure Describes Drew Ameroid's Fuel Treatment Products

Drew Ameroid Marine, Boonton, N.J., has published a four-page full-color brochure describing its complete line of chemicals for solving fuel problems on motor vessels.

The problems, symptoms, causes, and solutions are detailed in the areas of fuel handling and storage, combustion quality and burnability, and contaminants — impurities.

Drew Chemical, a subsidiary of United States Filter Corp., New York, is a major supplier of products and services for water management and specialty chemicals for marine and industrial markets.

For a free copy of the brochure,

Write 15 on Reader Service Card

Christen Navy Hydrofoil 'Aquila' —Third Of Six Missile Ships Building At Boeing Marine

The Patrol Hydrofoil Missileship Aquila (PHM-4), the third of six all-weather combatant hydrofoils being built by Boeing Marine Systems, Seattle, Wash., for the U.S. Navy, shown during her recent launching, will join Pegasus (PHM-1) and Taurus (PHM-3), already commissioned, and three other PHMs to be delivered next year to form a six-ship PHM squadron at Key West, Fla.

The Aquila was christened by **Mrs. John D. Bulkeley,** wife of Rear Adm. **Bulkeley,** president of the Navy Board of Inspection and Survey, and principal speaker at the launch ceremony.

The PHM is a compact, highly mobile, combatant Hydrofoil ship capable of speeds exceeding 40 knots. Designed for all-weather operations, PHM's fully submerged foil system permits the ship to operate in heavy seas with stability normally available only in much larger ships. The hydrofoils are equipped with Harpoon missiles and rapid-fire 76-mm cannon.

Boeing Marine Systems also produces commercial hydrofoils called Jetfoils, which have accumulated more than 100,000 hours of service and carried over 11,000,000 passengers since beginning operation in 1975.

HUDSHIP To Build Four Tug/Supply Vessels For Hornbeck

Four-vessel contract for tug/supply vessels is signed by **Larry D. Hornbeck** (left), president of Hornbeck Offshore Service, Inc., and **Wendle W. Huddleston,** president of HUDSHIP.

Wendle W. Huddleston, president and chief executive officer of Hudson Shipbuilder, Inc. (HUDSHIP), recently announced that he and **Larry D. Hornbeck,** president of Hornbeck Offshore Services, Inc. of Galveston, Texas, have signed a contract for the construction of four large offshore tug/supply vessels. The Pascagoula, Miss., shipyard will deliver the first vessel during the second quarter of 1982, with the final delivery during the fourth quarter of 1982.

The 185-foot vessels will be powered by twin Caterpillar D-399 turbocharged diesel engines, each with a maximum continuous rating of 1,125 bhp at 1,225 rpm driving through Caterpillar Model 7261 gears at 4.22:1 ratio. The vessels will be fitted with Schottel S152L, 300-hp bow thrusters driven by Caterpillar 3406 engines.

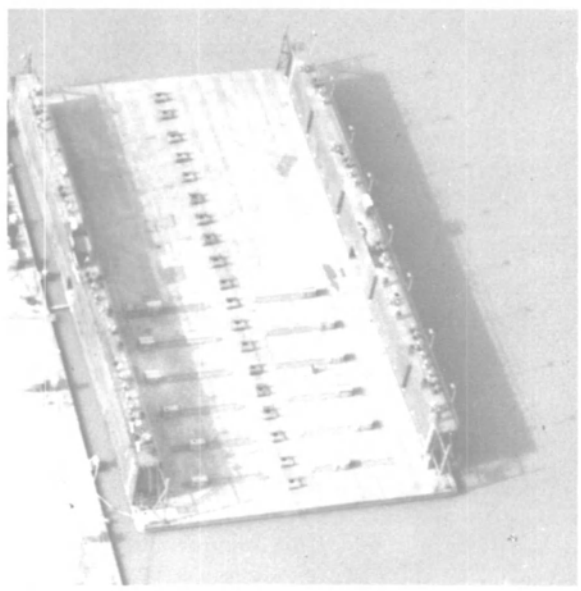
With a beam measurement of 40 feet and at a depth of 14 feet, this allows the vessels to carry a minimum of 400 long tons of cargo. Each vessel will be equipped to carry both liquid and bulk mud as well as fuel and drill water for servicing offshore rigs.

The vessels will be classified to ABS Maltese Cross A-1E and Maltese Cross AMS Full Ocean Service.

Hornbeck Offshore is a service ship company based in Galveston, Texas, with operations in Corpus Christi. Their services are directed at the offshore rig supply and geophysical exploration markets. Hornbeck currently operates an existing fleet of nine vessels, with another six under construction.

These four vessels will be built at HUDSHIP's new West Bank facility, which is located on a 16½-acre site on the Pascagoula River just north of the Ingalls yard.

4,000-Ton Drydock 'H.S. Geneen' Christened At Delta Shipyard



Mrs. June Geneen recently christened a new 4,000-ton floating drydock, H.S. Geneen (shown above), named in honor of her husband **Harold S. Geneen,** Delta Services board chairman. The dock was designed and built by Delta Shipyard, a division of Delta Services Industries, Houma, La.

Ralph Arceneaux, president of Delta Shipyard, welcomed the more than 500 guests at the ceremony. **Leon Toups,** president and chief executive officer of Delta Services Industries, introduced the members of the board of directors and officers of the company which included **Harold S. Geneen,** the guest speaker.

The blessing was given by Bishop **Warren L. Boudreaux** bishop of the Houma-Thibodaux diocese, and Father **Gerard Hayes,** pastor of St. Anthony Church.

This new drydock is one of the most advanced and versatile in the area. It enables Delta to drydock and repair inland and coastal drill barges, drill tenders, oilfield supply vessels, seagoing tugs, suction and bucket dredges, crane barges, and offshore tank and deck barges.

The drydock has a pumping capacity of 22,000 gallons per minute. The pontoon is 200 feet long and the span between the 18-foot-high wingwalls is 92 feet. At full submergence the depth of water over the pontoon is 16 feet.

The drydock was designed to meet the rules of the American Bureau of Shipping, and is documented by the U.S. Coast Guard.

Located near the junction of the Gulf Intracoastal Waterway and the Houma Navigational Channel, this drydock and associated shore facilities will greatly complement Delta's present 25-acre complex for marine repair and new construction.

Levingston Delivers Dixilyn-Field 87

Levingston Shipbuilding Company, Orange, Texas, recently delivered the self-elevating mobile offshore drilling rig Dixilyn-Field 87 to its owners, the Dixilyn-Field Drilling Company of Houston.

The Dixilyn-Field 87 is a Levingston Class 111-C jackup, capable of operating in water depths up to 300 feet, in weather equivalent to Gulf of Mexico hurricane conditions, and in ambient temperatures as low as minus 20 degrees Celsius. The rig will drill in the Gulf of Mexico under contract to Amoco Oil Corp.

The Dixilyn-Field 87 is the second in its current series of Class 111-C jackups of which a total of seven are under construction either at Levingston's yards or those of its international licensees.

Dixilyn-Field Drilling Co. is one of the leading offshore contractors operating a fleet of 11 rigs both in U.S. waters and overseas, including seven jackups, three semisubmersibles, and one submersible.

Chevron Transport Installs Megasystems D.O.T. Units Aboard Two Tankers

Chevron Transport Corporation of San Francisco recently purchased two Direct Optical Tuning (D.O.T.) units — the latest diesel combustion analysis system designed and manufactured by Megasystems, Inc. of Boca Raton, Fla. and Cleveland, Ohio. These portable units are very compact, measuring only 22 by 20 by 6 inches.

The Chevron units, which feature video and digital displays as well as graphics printers, will be used aboard the company's 80,000-dwt motor tankers William E. Mussman and Kenneth E. Hill. These systems will analyze the diesel generators as well as the main engines.

For additional information on Megasystems' Direct Optical Tuning system,

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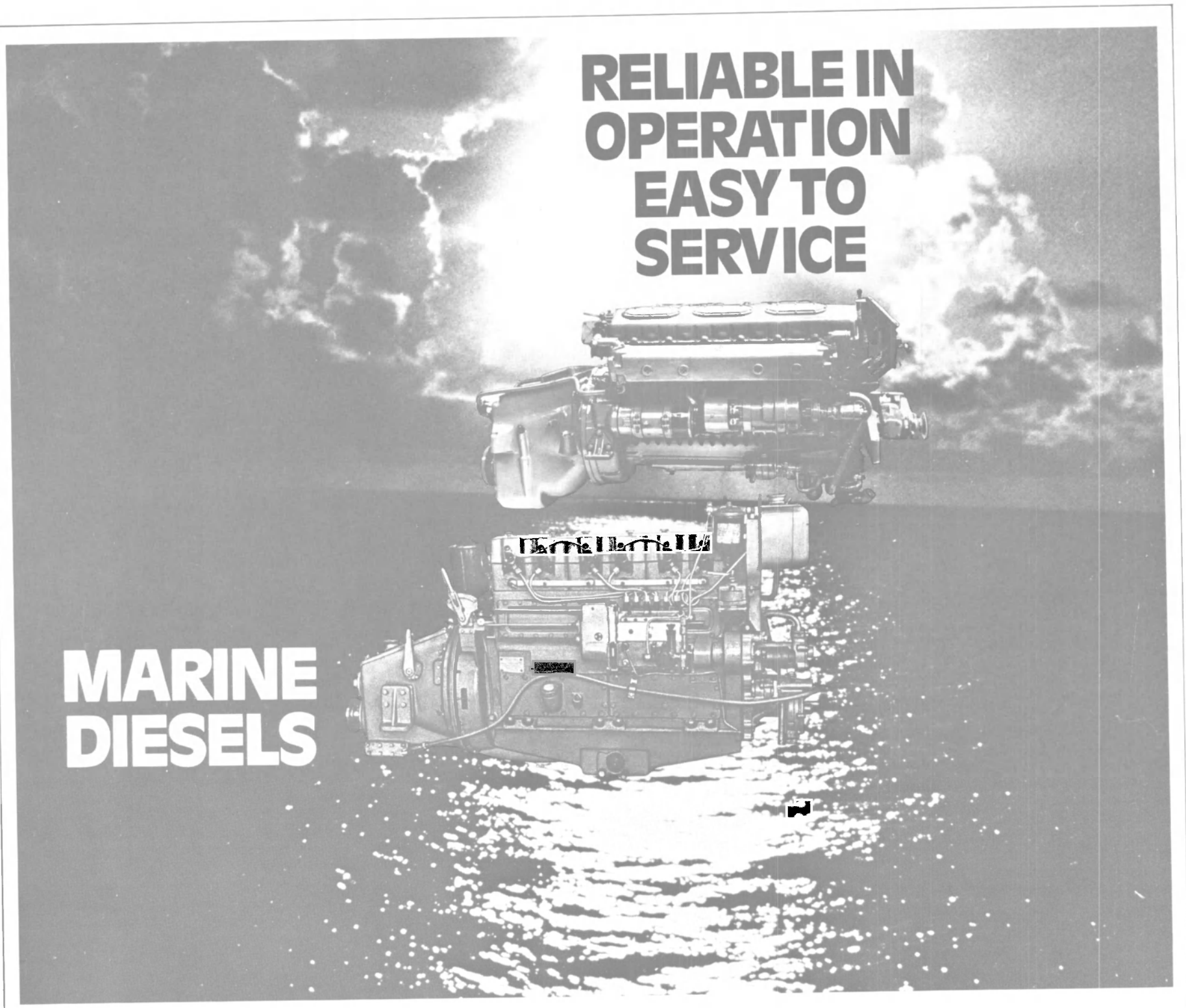

Models	Capacity, hp.	rpm
4 TchSP 8.5/11	25	1,500
6 TchSP 9.5/11	55	1,800
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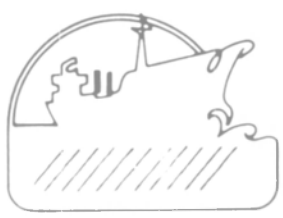

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Degree in Materials Engineering or equivalent desired with five to seven years experience required with major shipbuilder, ship operator and/or coating manufacturer with emphasis on corrosion control and mitigation analysis, coating selection, and application techniques.

Specific duties will include inspection and analysis of existing ship corrosion control systems, recommendations for reconditioning actions, selection of systems and suppliers for new construction, and on-site supervision of coating applications and corrosion control system installations.

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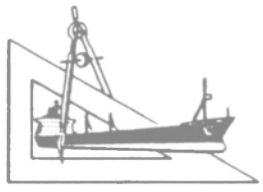

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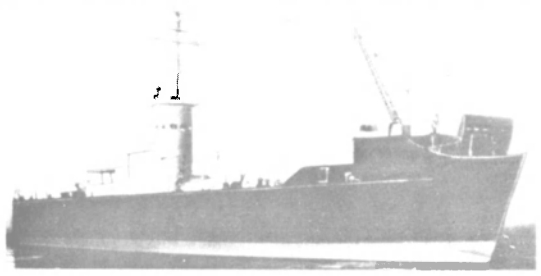

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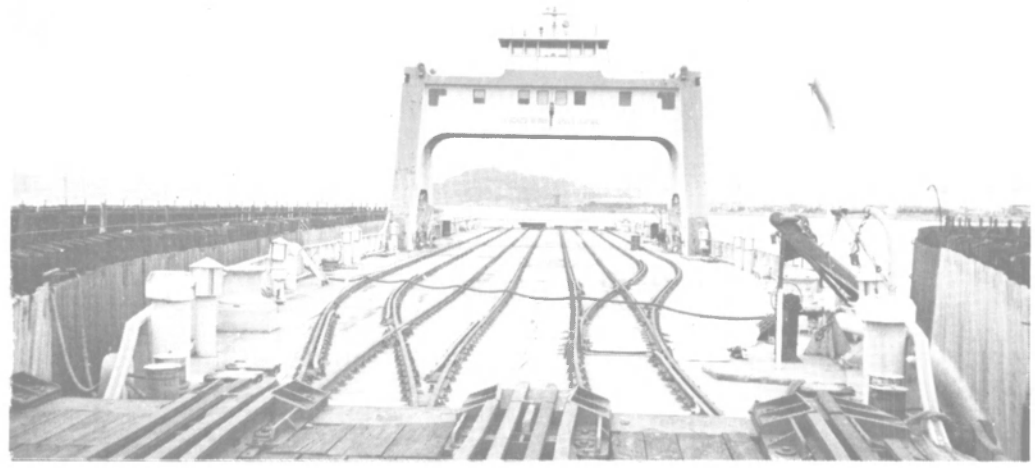

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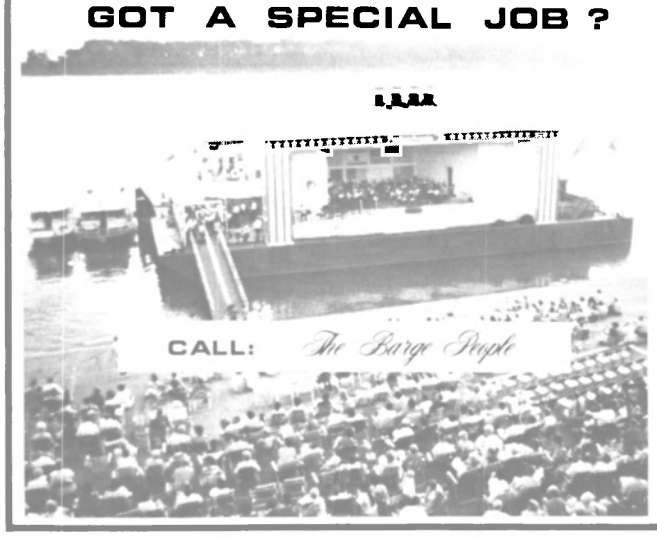

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STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
HARBOR DESIGN AND CONSTRUCTION

INVITATION FOR
PROJECT STATEMENT OF INTEREST

SOUTHWESTERN FERRY REPLACEMENT,
DESIGN PHASE

The State of Alaska, Department of Transportation and Public Facilities, Harbor Design and Construction, intends to negotiate a contract with a Naval Architect-Marine Engineering firm. The work to be performed involves a replacement vessel for the Alaska ferry M/V Tustumena (296′ LOA O.N. 295172). This will include — the design; preparation of plans, specifications and estimate; regulatory agency liaison and as yet undefined construction phase services. The preconstruction work shall be completed within one year.

The Department has issued the **M/V TUSTUMENA Replacement Study**, which summarizes the recommendations of three naval architects; demographic, traffic, and climatic data; and the basic requirements set forth by the State. The replacement vessel shall have among its characteristics and capacities; berthing for 150; total persons allowed 450; 80 standard vehicles; 350′ LOA; and 16 knot service speed.

Based on an evaluation of the "Project Statements of Interest", the 4 top ranked consultants will be asked to submit formal proposals followed by interviews. Evaluation and selection of consultants, Statement of Interest, proposal, and interview will be conducted by a Consultant Selection Committee in accordance with departmental policy and procedure.

Statements of Interest for this invitation must include "Project Statement of Interest" and Federal Standard forms 254 and 255 (Architect-Engineer related services). Project Statement of Interest forms and the M/V TUSTUMENA Replacement Study may be obtained by contacting:

Project Manager
C/O Alaska Marine Highway System
Pier 48
Seattle WA 98424
(206) 623-6850
Attn: John McGrath

Submittals must be received in ten (10) copies by 3:00 PM, Juneau Local Time, October 20, 1981 at the address below:
Harbor Design & Construction
Room 215, Island Center Building, Douglas, Alaska
Pouch Z, Juneau, Alaska 99811
RE: Southwestern Ferry Replacement (M/V TUSTUMENA)

The Department of Transportation and Public Facilities reserves the right to reject any and all submittals.

Robert W. Ward
Commissioner
Department of Transportation
and Public Facilities

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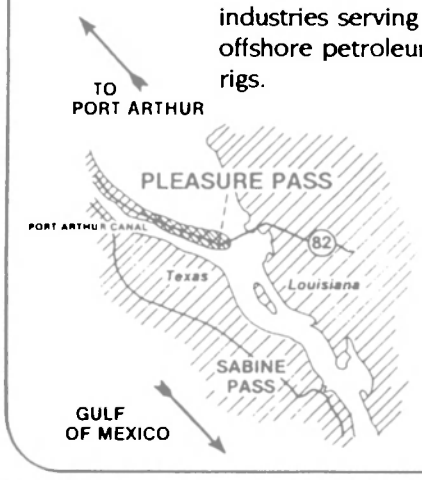

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STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
HARBOR DESIGN AND CONSTRUCTION

INVITATION FOR
EXPRESSION OF INTEREST

PROJECT NO. X61744
M/V COLUMBIA REPOWER

The State of Alaska Department of Transportation and Public Facilities, Southeast Region, Harbor Design and Construction Branch intends to contract the services of a Naval Architect/Marine Engineering firm knowledgeable in Propulsion Systems. The consultant will be required to conduct studies and prepare complete plans, specifications and cost estimate for main engine replacement and refurbishment or replacement of auxiliary equipment and machinery on the M/V Columbia. This vessel is a twin screw, 418 ft., Alaska State Ferry presently powered by Enterprise Diesels (Model DMRV 16-4).

The consultant's task will be to do preliminary engineering to include but not be limited to:

1. Perform a ship check.
2. Study and recommend replacement engines make and model.
3. Examine the existing reduction gears and recommend replacements or refurbishment measures.
4. Recommend refurbishment or replacement of pertinant motors, pumps and other auxiliary equipment.
5. Inspect and recommend measures concerning the hubs, propellors, pitch control system and shafts.
6. Inspect exhaust system and uptake insulation and make recommandations concerning its adequacy and necessary repairs or replacements.
7. Prepare purchase specifications for the State of Alaska to pre-order main propulsion engines and other long lead time items.
8. Prepare detailed plans, specifications and engineers estimates to advertise for shipyard contract to do all necessary work.
9. Review shipyard bids and recommend awarding of the contract.
10. An option for construction engineering services.

The consultant will be required to have plans, specifications and engineer's estimate for a shipyard contract prepared by March 15, 1982. The vessel will be available for construction on November 15, 1982. Construction will be complete by April 15, 1983.

One (1) contract is proposed for negotiation. Interested consultants will be required to submit six (6) copies of the Expression of Interest Questionnaire to the following address:

James L. Nelson
Marine Facilities Manager Alaska Department of Transportation & Public Facilities
Southeast Region Harbor Design and Construction Pouch Z
Juneau, Alaska 99811

or delivered to Mr. Nelsons office at the Island Center Building in Douglas, Alaska.

In order to be considered submittals must be received by 4:30 PM Pacific Standard Time, October 15, 1981, at Mr. Nelson's office.

Submittals must include the following:

1. Expression of Interest Questionnaire
2. Federal Standard form 254 (Architect-Engineer and Related Services Questionnaire)
3. Federal Standard form 255 (Architect-Engineer Related Services for Specific Project) completed for the consultant and each proposed sub-consultant.

The above forms and questionnaire may be obtained from Mr. Nelson's office at the above address or by calling (907) 364-3445.

The Department reserves the right to reject any and all submittals.

ROBERT W. WARD
Commissioner
Alaska Department of Transportation and
Public Facilities

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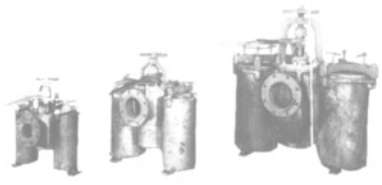

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Good Condition. Immediately Available. Priced at a fraction of New Replacement Cost. Complete with Lifting Beams and Spreader Beams (not shown in photograph)

AC Power Input Through Cable Reel
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2–265 KW–500 Volt DC M-G Sets

Units Can Be Modified

Possible other uses:
1) Moving heavy equipment
2) Dam Sites
3) Concrete Prefab plants
4) Railroad yards
5) Steel plants

Geared Track is also available at extra cost

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Floating Crane

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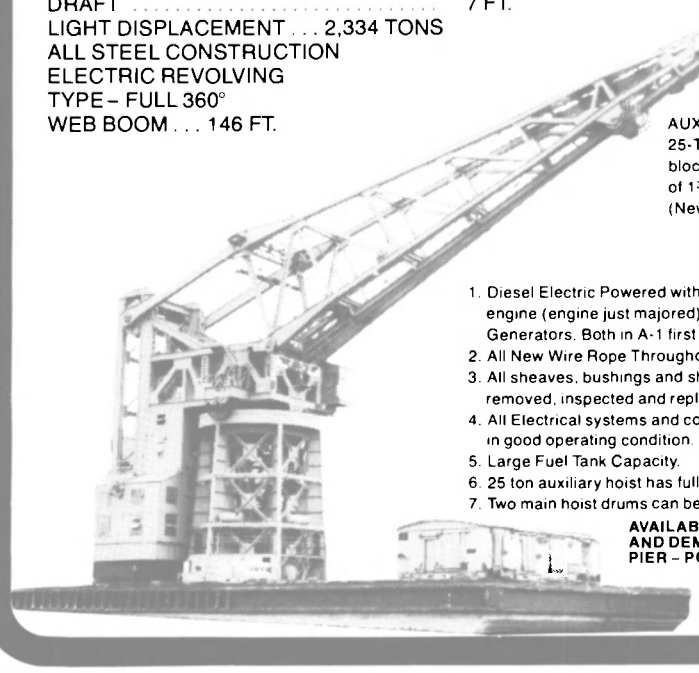
LENGTH OVERALL ..... 140 FT.
BEAM ..... 84 FT.
DRAFT ..... 7 FT.
LIGHT DISPLACEMENT . . . 2,334 TONS
ALL STEEL CONSTRUCTION
ELECTRIC REVOLVING
TYPE – FULL 360°
WEB BOOM . . . 146 FT.

MAIN HOIST
200-Ton – By 2 only, 8 part blocks. Each block carries 2,050 ft. of 1½". 6 x 37 I.P.S. wire rope (New).



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25-Ton – By 1 only 4 part block. Block carries 1,110 ft of 1⅜". 6 x 37 I.P.S. wire rope (New).

1. Diesel Electric Powered with G.M. 8-278A diesel engine (engine just majored) and 300 KW. 230 volt Generators. Both in A-1 first class condition.
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NEW 1970-72

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AC Power Input with Cable Reel and 350 feet of 500 MCM Cable.

MG set: 250 HP-AC-170 KW 230 DC.

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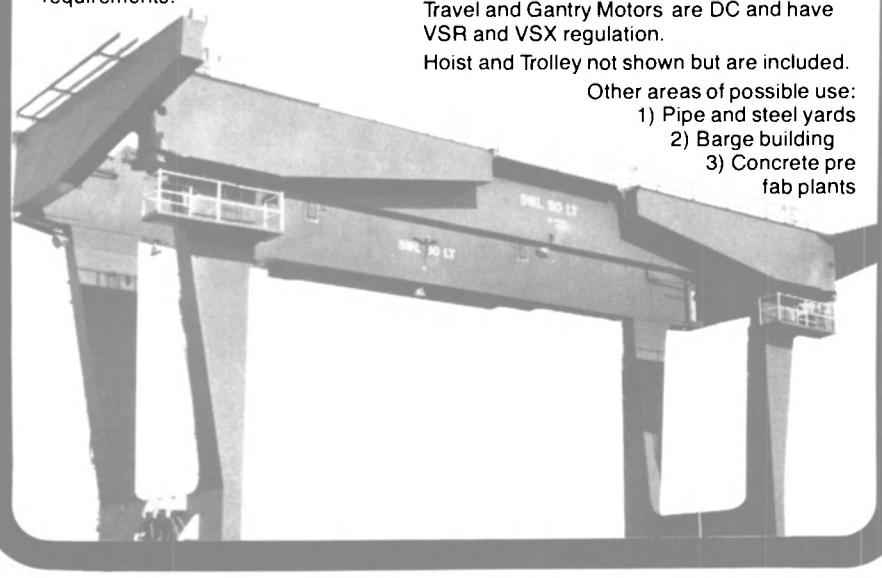
Hoist and Trolley not shown but are included.



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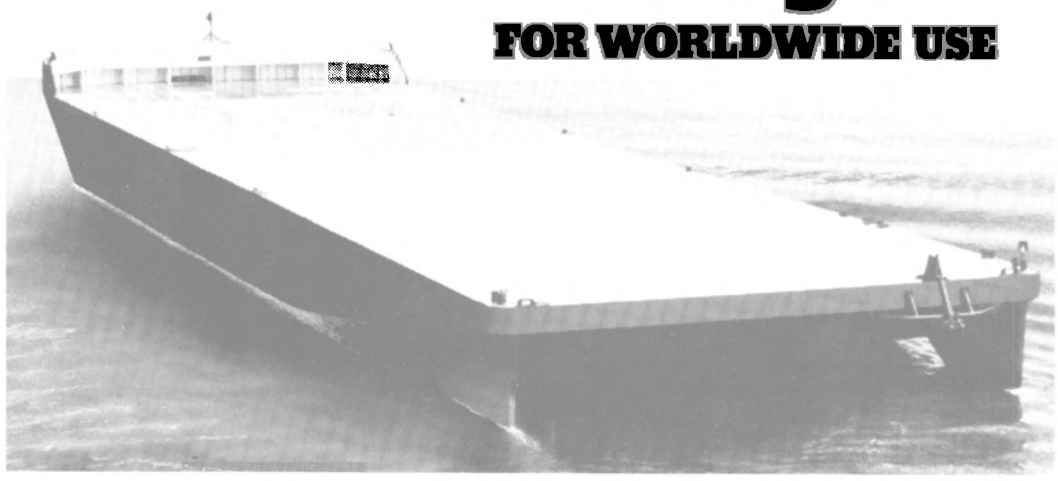

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Certificate of Registry
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Panama Canal Tonnage Certificate

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

DECK CARGO

Open Deck Area	37,886 S.F.
Deck Load	1,500 P.S.F.
D.W.T.	18,500 L.T.

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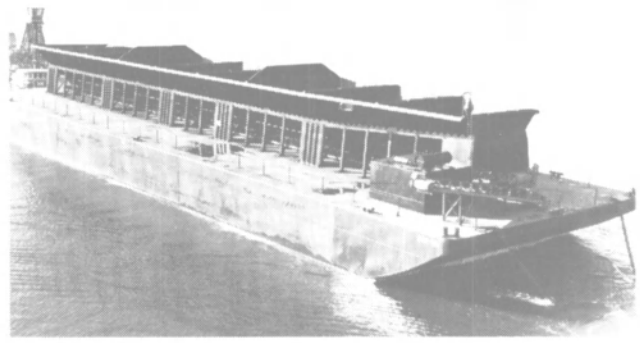
Oil Cargo	150,000 BBL's 21,000 L.T.
Cargo Piping	14" Mains 10" Suctions

AVAILABLE DECEMBER 14, 1981

Self Unloading Aggregate Barge



ZAG-501

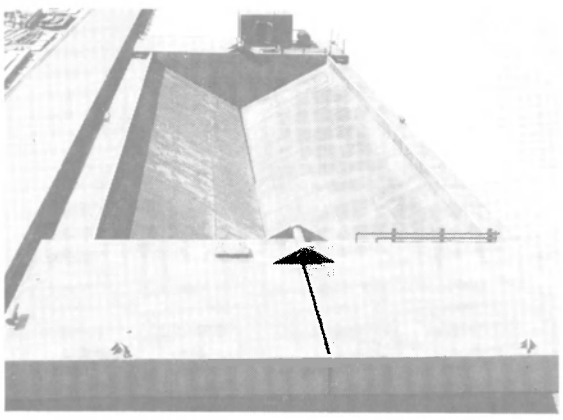
Length (O.A.)	248'- 0"
Beam	63'- 0"
Depth	16'- 0"
Displacement Light	1010 S.T.
Draft Light (F.W.)	2'- 7½"
Draft Loaded (F.W.)	11'- 8"
DWT	4000 S.T.
Diesel Electric Set	100 KV
Hopper Volume	2667 cu. yd.

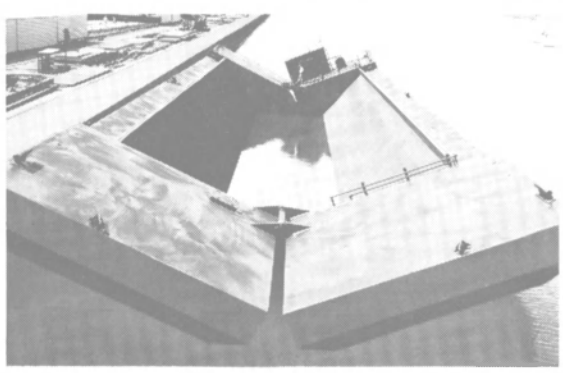
Hopper Unloading Gates: 27-36" x 36" Horiz. sliding gates w/individual hydr. controls.

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

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

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





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Built 1979. For sale, long or short term charters

SPECIFICATIONS

ABS loadlined for USCG-approved offport dumping

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

American Crane Barge

BARGE DATA

Displacement Light	1,200T.
Gross Tonnage	911
Net Tonnage	911
Length	151 - 6"
Beam	60'- 0"
Hull Depth	12'- 0"
Flush Deck Area	6,000 Sq. Ft.
Engine Room Area	412 Sq. Ft.
Office & Eating Area	136 Sq. Ft.
Diesel Fuel Tanks	36,000 Gal.
Fresh Water Tanks	36,000 Gal.
Bunker "C" Fuel Tanks	12,000 Gal.
Ballast System	None

CRANE DATA

Manufacturer	American Hoist & Derrick Co.
Model & Type	305 Revolver
Capacity	125 T.
Boom (Certified rating with 140' length, 160' available)	
20 part rigging	2,200 ft., 7/8"C – 6 x 36 I.P.S.
4 part standing standing bail	2-186 ft., 1¾"C – 6 x 36 I.P.S.
Main Hoist (Certified rating: 58.5 T. @ 50' to 100', 8 part. rigg.)	
20 part rigging	3,250 ft., 1"C – 6 x 36 I.P.S.
Aux. Hoist (Certified rating: 10.0 T. @ 100') 15 T. Capacity	
2 part rigging	635 ft., 7/8"C – 6 x 66 I.P.S.

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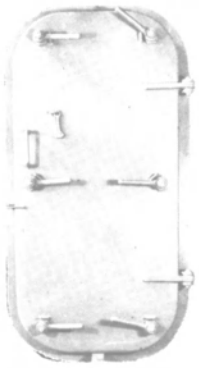
NEW WATERTIGHT DOORS

Steel Dogs



6-Dog right and left hand hinged doors with frames. Constructed of 1/4" steel plate and meet Coast Guard regulations for above deck as well as below deck use. All dogs are bronze bushed. Also available with 8" bronze portlights.

SIZE

26"x48" 26"x66"
26"x60" 30"x60"

EACH DOOR

IMMEDIATE DELIVERY

NEW 7" RADIUS PANAMA CHOCKS

(MEET PANAMA REGULATIONS)

14" X 10" CLEAR OPENING

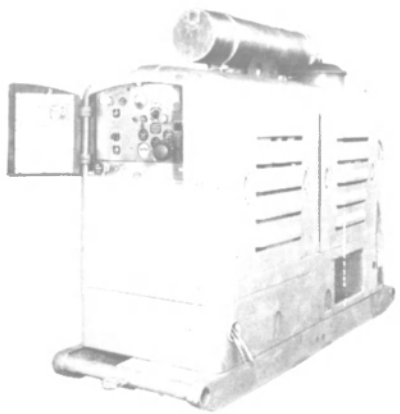
With extended legs for welding to deck. 14" Wide on base — length 28" — height 27¼". IMMEDIATE DELIVERY FROM STOCK.

NEW UNUSED 12"X6½" PANAMA CHOCKS FOR SMALL VESSELS

Closed chocks — 12" X 6½" inside opening — 23" overall outside — 8" high — 15" high — 7" radius — weight 110 lbs. IN STOCK.

30 KW GM 3-71 DIESEL GENERATOR SETS

with self-contained fuel tank and switchboard



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30KW Delco generator—80% P.F. GMC 3-71 diesel has 24 volt electric starter, with oil, amps & temp gauges, alternator and muffler. Generator equipped with main circuit breaker, voltage regulator, voltmeter, ammeter, frequency meter. 220/440/3/60—1200 RPM. Dry weight 4950 lbs. 100" long x 34" wide x 78" high.

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MOORING FAIRLEADS

WITH 12" CLEAR OPENING

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4 Vertical rollers — 5½" diameter—2 horizontal rollers—5½" diameter, split to enable working from either end of fairlead. Steel sideframe ⅞"—top & bottom 1". Handles 1½" wire easily—up to maximum lead 80°.

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(1) Same as above, but 2-speed 1750/750 RPM — Frame 184TCZ

(2) 12,880 CFM — Size 15AF — Baldor Motor — 7.5/1.9 HP — 440/3/60 10/3.5 amps — 1750/880 RPM — 40°C — Frame 215TCZ

20,000 CFM — 1.9" SP — Size 200AF — 10 HP — 440/3/60 — 1750/880 RPM

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

(1) 6000 CFM — AF40 — Baldor Motor — 3 HP — 440/3/60 — 1750 RPM — Ins. F — 40°C — Frame 182TCZ

(3) 2000 CFM — size 20AF — .75 HP — 440/3/60 — 3450 RPM 1.3 amps — Ins. F — 40°C — Frame 560Z.

THE BOSTON METALS COMPANY

313 E. Baltimore St. Baltimore, Md. 21202
Marine Warehouse (301) 752-1077
TWX: 710-234-1637

CROUSE HINDS 1000 WATT FLOODLIGHTS

IN STOCK
NEW — UNUSED

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.

THE BOSTON METALS COMPANY

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Marine Warehouse (301) 752-1077
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NEW SURPLUS BERGER MODEL 614-0 MOORING FAIRLEADS

for 1¼" WIRE — DECK MOUNTED
12" Opening Allows for Large Wire Rope Loop

14" Diameter sheave — 12" shank opening — tapered roller bearing. Weight 1135 lbs.

THE BOSTON METALS COMPANY

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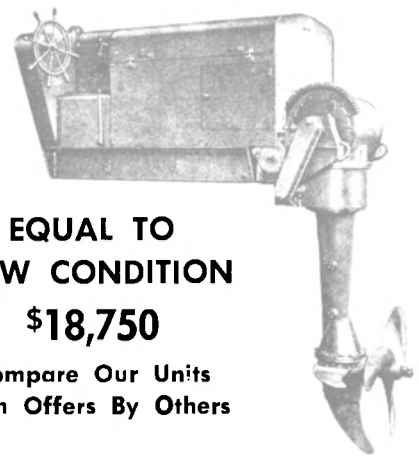
TWX: 710-234-1637

M&T Model O-2D Marine Outboard Diesel Driven Propulsion Units



EQUAL TO NEW CONDITION

$18,750

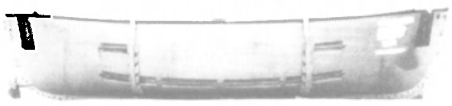
Compare Our Units With Offers By Others

Equal-to-new-condition. Driven by GM 6-71 diesel—165 HP @ 1800 RPM—2-cycle—6 cylinders. Weight 9300 lbs—48" X 24" propeller. Unit shown with outboard shaft in running position. Distance from deck to bottom of skeg 89". 4 Units immediately available.

THE BOSTON METALS COMPANY

313 E. Baltimore St. Baltimore, Md. 21202
Marine Warehouse (301) 752-1077
TWX: 710-234-1637

FIBERGLASS 53 PERSON DIESEL POWERED LIFEBOATS



- Length overall 8 M. (26.24')
- Beam over fenders 2.89 M (9.5')
- Beam over outside shell 2.75 M (9')
- Depth 1.15 M (3.7')
- Empty boat weight 2380 Kg (5247 lbs)
- Boat weight w/passengers 6355 Kg (14,010 lbs)
- Cubic ft. per passenger 15.31
- Distance between hooks 6700 MM (21' 11½")

MFG. BY FR FASSMER & CO., GERMANY.

With air-cooled Deutz diesel engine, gear box and propeller. Has fuel oil and water tanks, provision storage. Built to German Lloyds requirements. #6706 built 1977; #6859 built 1977.

THE BOSTON METALS COMPANY

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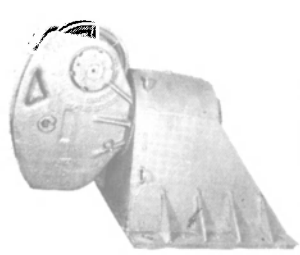
TWX: 710-234-1637

SURPLUS BERGER FAIRLEADS



2 Model 620 — for 1⅝" wire — 20" sheave.

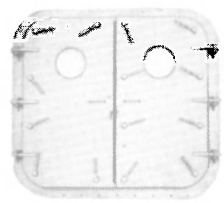
$3500

Also 1 for 1¼" wire

THE BOSTON METALS COMPANY

313 E. Baltimore St. Baltimore, Md. 21202
Marine Warehouse (301) 752-1077
TWX: 710-234-1637

60" X 54" WATERTIGHT STEEL DOUBLE DOORS



Used doors — with 10" diameter lites. Each door has 7 dogs for a total of 14.

THE BOSTON METALS COMPANY

313 E. Baltimore St. Baltimore, Md. 21202
Marine Warehouse (301) 752-1077
TWX: 710-234-1637

49¢ Per Pound

NEW — UNUSED 2¾" STUD LINK CHAIN

WITH CERTIFICATES

20 Shots—grade 2—49¢/lb. Each shot weighs 6450 lbs.
Connecting links for above chain — $575 each

THE BOSTON METALS COMPANY

313 E. Baltimore St. Baltimore, Md. 21202
Marine Warehouse (301) 752-1077
TWX: 710-234-1637

NEW — UNUSED 32' ALUMINUM ACCOMMODATION LADDERS

Mfg. by Ramp Master. With 24" wide treaded aluminum steps. Self-feathering — with lower platform and safety rails. (Turntables not available.) New from factory, ladder only would be approximately $10,500 and lower platform $450.

OUR PRICE **$5995** (New turntables cost about $3300)

THE BOSTON METALS COMPANY

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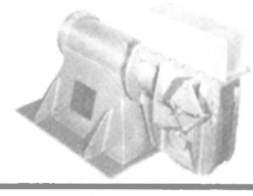
Marine Warehouse (301) 752-1077
TWX: 710-234-1637

NEW BALANCED HEAD FAIRLEADS

1¼" **$2775**



1½" **$3350**

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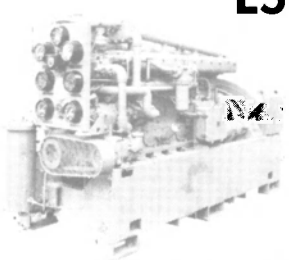
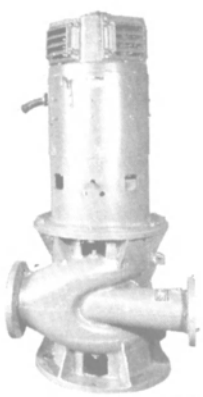
LST MACHINERY



100KW GBD-8 DIESEL GENS.

120/240 VDC—417 amps—stab shunt—1200 RPM—Delco generator—Self-excited. ENGINE: Superior GBD-8—8-cyl —5½X7—150 HP—30 volt electric starting. Reconditioned to ABS. Dry wt. 10,000 lbs—DAL 124"—65 11/16" high —42" wide. Hgt necessary to pull piston 68". Fuel consumption 0.620 lbs/hr.

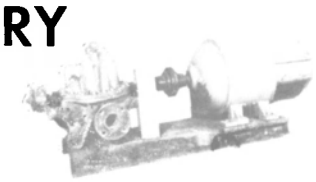


GARDNER-DENVER BALLAST PUMP

Bronze — 1500 GPM — 56' head or 25 bs — 8" suction — 6" discharge. MOTOR: Century 30 HP 230 VDC 110 amps 1750 RPM. 40°T rise — stab. shunt — ballbearing — dripproof. Controls available.

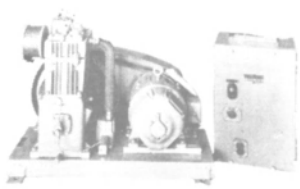
TAILSHAFTS

Diameter: 6 1/8" Length: 21' 2 5/8"



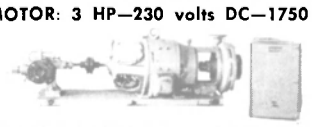
GOULD FIRE & BILGE PUMP

250 GPM & 100 lbs—4" suction—3" discharge—2200 RPM—bronze—manufactured by Gould. Direct connected to 30 HP 230 volt DC Louis-Allis motor.



CLUTCH TIRE AIR COMPRESSOR

Model 320—4 X 2½ X 3"—10/15 CFM—100/150 PSI—700 RPM. MOTOR: 3 HP—230 volts DC—1750 RPM.



COMBINATION LUBE OIL & SALT WATER COOLING PUMPS

Model 3630—mfg by Goulds—1150 RPM. Rotary lube oil pump one end (35 GPM @ 15 PSI—1½"X1½")—salt water circulating pump other end (35 GPM @ 15 PSI—2" X 1½") G.E. Motor model 5B254A1988—type B —Frame 254—3 HP—230 VDC—11.9 amps—1150 RPM compound—Cont. 40°C temp rise. Ball bearing.

THE BOSTON METALS COMPANY

313 E. Baltimore St. 752-1077 Baltimore, Md. 21202
TWX: 710-234-1637

BUYERS DIRECTORY

AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION
Adrick Cooling Corporation, 30 B. Remington Blvd., Ronkonkoma, NY 11779
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
James D. Nall Co., Inc., 3195 NW 20th Street, Miami, FL 33142
York Division (Borg-Warner Corp.), P.O. Box 1592, York, PA 17405

ANODES—Cathodic Protection
Engelhard Industries Division, 2655 U.S. Route 22, Union, NJ 07083
Kaiser Aluminum & Chemical Corp., 300 Lakeside Dr., (Rm 2039KB), Oakland, CA 94643
Wilson Walton International Inc., 66 Hudson Street, Hoboken, NJ 07030

BEARINGS—Rubber, Metallic, Non-Metallic
Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44052
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wisc. 53186

BLASTING—Cleaning—Equipment
Aurand, 1270 Ellis Street, Cincinnati, OH 45223
Butterworth Systems Inc., 224 Park Ave., Florham Park, NJ 07932
Goff Corporation, One Pleasent Grove Rd., Seminole, OK 74868

BOILERS—Tube Cleaning
Clayton Manufacturing Company, 486 No. Temple City Blvd., El Monte, CA 91731
Combustion Engineering, Inc., Windsor, Connecticut 06095
A.B. Murray Company, Inc., P.O. Box 476, Elizabeth, NJ 07207

BROKERS
Aldenships, 2182 S.E. 17th Street, Fort Lauderdale, FL 33316
B.R.I. Coverage Corporation, 156 Williams Street, New York, NY 10038
Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, La. 70153
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

BUNKERING SERVICE
Belcher Company, Inc., 8700 West Flagler, P.O. Box 525500, Miami, FL 33152
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

CHAINS
Neptunia, Via Giovanni da Verrazzano, 12 16 165 Genova, Italy

CHOCKING SYSTEMS
Palmer Products Inc., P.O. Box 8, Worcester, PA 19490
Philadelphia Resins Corp., 20 Commerce Drive, Montgomeryville, Pa. 18936

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

CONTROL SYSTEMS—Monitoring
Arnessen Marine Systems, Inc., One Battery Plaza, New York, NY 10004
Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913
Megasystems, Inc., 1075 N.W. 58th Street, Boca Raton, FL 33431
National Marine Service, Inc., 1750 Brentwood Blvd., St. Louis, MO 63144
Pan American Systems Corporation, P.O. Drawer 400, Belle Chasse, LA 70037
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062

COUPLINGS
Bird-Johnson Co., 110 Norfolk St., Walpole, MA 02081

CRANES—HOISTS—DERRICKS—WHIRLEYS
American Hoist & Derrick Company (AMHoist), St. Paul, MN 55107
Blohm & Voss Company, 55 Morris Avenue, Springfield, NJ 07081
M. P. Howlett, Inc., 410 32nd St., Union City, N.J. 07037
National Supply Company, 1455 West Loop South, Houston, TX 77027
J. D. Neuhaus, Witten-Heven, Hebezeuge, D 5810 Witten-Heven, West Germany
Paceco Inc. (A division of Fruehauf), West Seaway Access Road, Gulfport, MS 39501

DECK MACHINERY—Cargo Handling Equipment
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134
Navire Cargo Gear (SEA) Pte. Ltd., 9th Floor Orchard Towers, Orchard Road, Singapore 0923

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
Golten Marine Company, Inc., 162 Van Brunt Street, Brooklyn, NY 11231
Haynes Corporation, 3725 Commerce Street, Jackson, MI 49204
Twin Disc, Inc., 1328 Racine Street, Racine, WI 53403

ELECTRICAL EQUIPMENT
Argo Marine, Div. of Argo Intl., 140 Franklin St., New York, N.Y. 10013
Federal Pacific Electric Company, P.O. Box 1800, Somerville, NJ 08876
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

EMULSIFICATION SYSTEMS
Hoffert Manufacturing Company, Inc., 1700 East Church Street, Jacksonville, FL 32202

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
Comet Marine Supply Corp., 157 Perry St., New York, N.Y. 10014
Conhagen/USMP Company, Inc., 4475 South Clinton Ave., South Plainfield, NJ 07080
Consafe Inc., P.O. Box 40339, Houston, TX 77040
Duraline, 75 Hoffman Lane, Central Islip, NY 11722
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, N.Y. 10550
J. H. Menge & Company, Inc., P. O. Box 23602, New Orleans, La.
John P. Nissen, Jr. Company, Glenside, PA 19038
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
Stal Laval Inc., 525 Executive Blvd., Elmsford, NY 10523
Sudoimport, 5 Kalyaevskaya, Moscow K-6, USSR
Unitor Ships Service A/S, Mastemyr, 1410 Kolbotn, Norway
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wisc. 53186
Xorbox, Division of Greene & Kellogg, Inc., 290 Creekside Dr., Tonawanda, NY 14150
Zesco, Inc., 3694 Westchase Drive, Houston, TX 77042

EVAPORATORS
Aqua-Chem Inc., P.O. Box 421, Milwaukee, WI 53201
Riley-Beaird, Inc., P.O. Box 1115, Shreveport, La. 71130

EXPANDED METALS — METALS
Fibergrate Corporation, P.O. Box 344610, Dallas, TX 75234
Lukens Steel Company, Coatesville, PA 19320
Millard Controlled Metals, 5 Louise Drive, Ivyland, PA 18974

FANS—VENTILATORS—BLOWERS—HEATEXCHANGERS
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
Hughes Bros., Inc., 17 Battery Place, New York, N.Y. 10004
Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062
Seaward International, Inc., 6269 Leesburg Ave., Falls Church, Va. 22044

FINANCING—Leasing
Continental Illinois National Bank, 231 S. LaSalle, Chicago, Il 60693
Kidder, Peabody & Co., Inc., 10 Hanover Square, New York, N.Y. 10005
Warburg Paribas Becker, Inc., 2 First National Plaza, Chicago, Ill. 60670

FUEL OIL ADDITIVES—Analysis & Combustion Testing
Rolfite Products Inc., 300 Broad Street, Stamford, CT 06901

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

GALLEY EQUIPMENT
Kiefer Corporation, 2202 W. Clybourn, Milwaukee, WI 53233

GANGWAYS
Rampmaster Inc., 1226 N.W. 23rd Ave., Fort Lauderdale, Fla. 33311
W & A Engineers, Inc., 4040 Veterans Highway, Metairie, LA 70002

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
E. Mock & Sons, Inc., 20 Vesey Street, New York, NY 10017

HULL CLEANING
Butterworth Systems Inc., 224 Park Ave., Florham Park, N.J. 07932
Phosmarin Equipment, 21, Boulevard de Paris, 13002 Marseille, France
Seaward Marine Services, Inc., 6269 Leesburg Pike, Falls Church, VA 22044
Sub Enterprises, Inc., P.O. Box 16531, Irvine, CA 92713

HYDRAULICS
Fluid Technology, Inc., 10626 Phillips Highway, Jacksonville, FL 32224
Hydranautics, 6338 Lindmar Drive, Goleta, CA 93017
Voss, Inc., Building J, 7029 Huntley Road, Columbus, Ohio 43229

INERT GAS—Generators—Systems
ATCO Marine Corporation, 603 Dean St., Brooklyn, NY 11238
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
Peabody Holmes Ltd., 17-27 Garratt Lane, London SW 18 4BY

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

INSURANCE
Adams & Porter, 1819 St. James Place, Houston, Texas 77027
Adams & Porter, 1 World Trade Center, Suite 8433, New York, N.Y. 10048
Alexander & Alexander, Inc., 1185 Ave. of the Americas, New York, N.Y. 10036
B.R.I. Coverage Corporation, 156 Williams St., New York, NY 10038
Midland Insurance Co., 160 Water St., New York, N.Y. 10038

JOINER—Watertight Doors—Paneling
Masonite Commercial Division, Dover, OH 44622
Walz & Krenzer, Inc., 400 Trabold Road, Rochester, NY 14624

KEEL COOLERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062

LIFEBOATS & DAVITS
ATCO Marine Corporation, 603 Dean Street, Brooklyn, NY 11238
Schat Davit Corporation, 226 West Park Place, Newark, DE 19711

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
Browning Marine, Inc., (Aqua Signal), P.O. Box 806G, St. Charles, IL 60174
The Guest Corporation, 17 Culbro Drive, West Hartford, CT 06110
Oceanic Electrical Mfg. Co., 157 Perry Street, New York, N.Y. 10014
Oreck Corp., 100 Plantation Rd., New Orleans, LA 70123
Perko Inc., P.O. Box 6400D, Miami, Florida 33164
Port Electric Supply Corp., 157 Perry Street, New York, N.Y. 10014

MACHINE TOOLS
Republic-Lagun Machine Tool Co., 1000 E. Carson St., Carson, CA 90749

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
General Electric Company — Bldg. 2, Rm 216, Schenectady, N.Y 12345
Schnitzer-Levin Marine Co., 445 Littlefield Ave., So. San Francisco, CA 94080

MOORING SYSTEMS
Baldt Incorporated, P.O. Box 350, Chester, PA 19016
Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110

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

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Highway (Suite 1300), Arlington, VA 22202
Agemar, Ave. 17 No. 108-129, P.O. Box 1465, Maracaibo, Venezuela
All Points Associates, Inc., RD #1, Box 3309, Monroeville, OH 44847
American Standards Testing Bureau, Inc., 40 Water Street, New York, N.Y. 10004
Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505 35 Wisconsin Circle, Chevy Chase, Md. 20015
J.L. Bludworth, P.O. Box 2441, Corpus Christi, TX 78403
Jacksonville, Florida 32211
Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
C.D.I. Marine Co., Regency East, Suite 222, 9951 Atlantic Blvd.,
CTS & Associates, 11320 S.W. 108 Court, Miami, Fla. 33176
CADCOM, 107 Ridgely Ave., Annapolis, MD 21401
Childs Engineering Corp., Box 333, Medfield, Mass. 02052
John R. Colletti & Associates, P.O. Box 13378, Pittsburgh, PA 15243
Columbia-Sentinel Engineers Western, Inc., P.O. Box 21542, Seattle, WA 98111
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, Mass 02026
Crane Consultants Inc., 15301 1st Ave., So. Seattle, Washington 98148
C.R. Cushing & Co., Inc., One World Trade Center, New York, N.Y. 10048
Norman N. DeJong & Associates, Inc., 1734 Emerson St., Jacksonville, Fla. 32207
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, Inc., 2341 Jefferson Davis Hwy., Suite 1100, Century Bldg., Arlington, VA 22202
Donhaiser Marine, Inc., 11511 Katy Freeway, Houston, TX 77079
Francis C. Ducote, P.E., P.O. Box 644, Kenner, LA 70063
Parker C. Emerson & Associates, 17935 Cardinal Drive, Lake Oswego, Oregon 97034
Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington N.Y. 11050
Friede and Goldman, Ltd., 225 Baronne St., New Orleans, La. 70112
Giannotti & Associates, Inc., 703 Giddings Ave., Suite U 3, Annapolis, MD 21401
Gibbs & Cox, Inc., 40 Rector Street, New York, N.Y. 10006
John W. Gilbert Associates, Inc., 58 Commercial Wharf, Boston, Mass. 02110
The Glosten Associates, Inc., 610 Colman Bldg., 811 First Ave., Seattle, WA 98104
Phillip Gresser Associates, Ltd., 3250 South Ocean Blvd., Palm Beach, FL 33480
Morris Guralnick Associates, Inc., 620 Folsom Street, Suite 300 San Francisco, CA 94107
Hampton Roads Engineering, Inc., 119 E. Little Creek Rd., Norfolk, VA 23505
J.J. Henry Co., Inc., Two World Trade Center—Suite 9528, New York, N.Y. 10048
Hoffman Maritime Consultants Inc., 9 Glen Head Road, Glen Head, NY 11545
Hydronautics, Incorporated, 7210 Pindell School Road, Howard County, Laurel, Maryland 20810
Iantzen Engineering Co., 6655-H Amberton Drive, Baltimore, Md. 21227
James S. Krogen & Co., Inc., 3333 Rice St., Miami, Fla. 33133
Littleton Research and Engrg. Corp., 95 Russell St., Littleton, Mass 01460
Lucander Designs, P.O. Box 711, San Perlita, TX 78590
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
John J. McMullen Associates, Inc., 1 World Trade Center, New York, N.Y. 10048
MacLear & Harris, Inc., 28 West 44 Street, New York, N.Y. 10036
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114
Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, N.Y. 11746
Marine Technical Associates, Inc., 195 Paterson Avenue, Little Falls, NJ 07424
Maritime Service Company, 1357 Rosecrans St., Suite B, San Diego, CA 92106
Rudolph F. Matzer & Associates, Inc., 13891 Atlantic Blvd., Jacksonville, Fla. 32225
Mechanical Resources Inc., 191 Cambridge Avenue, Jersey City, N.J. 07307
George E. Meese, 194 Acton Rd., Annapolis, Md. 21403
Metritape, Inc., 33 Bradford Street, Concord, MA 01742
NKF Engineering Assoc., Inc., 8150 Leesburg Pike, Vienna, VA 22202
Nelson & Associates, Inc., 1405 N.W. 167th Street, Miami, FL 33169
Nickum & Spaulding Associates, Inc., 911 Western Ave., Seattle, WA 98104
Captain Conrad P. Nilsen, 66 Beverly Road, Bloomfield, NJ 07003
Norgaard and Clark, 114 Sansome St., San Francisco, CA 94104
Ocean-Oil International Engineering Corporation, 3019 Mercedes Blvd., New Orleans, La. 70114
Offshore Power Systems, 8000 Arlington Expressway, Jacksonville, FL 32211
Oromar International Enterprises, Inc., P.O. Box 13069, Port Everglades, FL 33316
PRC Guralnick, 5252 Balboa Ave., San Diego, CA 92117
Pacific Industries Inc., 1440 Canal Street, Suite 1915, New Orleans, LA 70112
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156
S.L. Petchul, Inc., 1380 SW 57th Ave., Fort Lauderdale, Fla. 33317
Pilotage Consultants, Inc., P.O. Box 3, Atlantic Highlands, NJ 07716
M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013 and 657 Mission St., San Francisco, Calif.
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
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
Robert L. Stevens Associates, Inc., 654 Beacon Street, Boston, MA 02215
Richard R. Taubler Inc., 8 Columbia St., Milford, Del. 19963
Thames Engineering Consultants Inc., P.O. Box 589, New London, Ct. 06320
Timsco, 622 Azalea Road, Mobile, AL 36609
Townsend Marine Consultants, 18 Church Street, Georgetown, CT 06829
Wadam Wartsila Helsinki Shipyard, P.O. Box 132, SF-00151 Helsinki 15, Finland
Wesley D. Wheeler Assoc., Ltd., 104 E. 40th St., Suite 206, New York, NY 10016
James Weisbeck, 240 O'Kell Street, Buffalo, NY 14220
Thomas B. Wilson, 920 North Avalon Blvd., Wilmington, CA 90744
Wind Ship Development Corporation, 690 Main Street, Norwell, MA 02061
Wink Incorporated, 8020 Mayo Blvd., New Orleans, LA 70126
XPLO Corporation, 229 Fifth Street, Gretna, LA 70053

NAVIGATION & COMMUNICATIONS EQUIPMENT
AAT Communications Corporation, 1854 Hylan Blvd., New York, NY 10305
American Hydromath Co., Buckwheat Bridge Rd., Germantown, N.Y. 12526
Apelco Marine Electronics, Division of Raytheon, 676 Island Pond Rd., Manchester, NH 03103
Comsat General Corp., 950 L'Enfant Plaza, S.W., Washington, D.C. 20024
DEBEG Marine, Inc., 10 Manor Parkway, Salem, NH 03079
Electro-Nav Inc., 840 Bond Street, Elizabeth, NJ 07201
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
Griffith Marine Navigation, Inc., 134 North Avenue, New Rochelle, NY 10801
Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
ITT Mackay Marine, 2912 Wake Forest Road, Raleigh, N.C. 27611
Intermarine Electronics, Inc., Flowerfield Bldg. #7, St. James, N.Y. 11780
Iotron Corp., 5 Alfred Circle, Bedford, MA 01730
Kongsberg North America Inc., 135 Fort Lee Road, Leonia, NJ 07605
Kongsberg Vapenfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway
Krupp Atlas-Elektronik, 241 Erie Street, Jersey City, NJ 07302
Magnavox Navigation Systems, 2829 Maricopa Street, Torrance, CA 90503
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 23606
Navigation Communications Systems, Inc., 20100 Plummer Street, Chatsworth, CA 91311
North American Philips Communication Corp., 55 Knights Bridge Road, Piscataway, NJ 08854
RCA Service Co., Building 204-2, Camden, N.J. 08101
Racal-Decca Marine, Inc., P.O. Box G, #1 Commerce Blvd., Palm Coast, FL 32037
Racal-Decca Marine, Inc., 4200 23rd Avenue West, Seattle, WA 98199
Radar Devices, Inc., 2955 Merced Street, San Leandro, CA 94577
Raytheon Marine Co., 676 Island Pond Road, Manchester, N.H. 03103
Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061
Simrad Inc., 1 Labriola Court, Armonk, N.Y. 10504
Southern Marine Research, Inc., 1401 N.W. 89th Court, Miami, FL 33172
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.
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
Ferrous 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
Houston Marine Services, Inc., 505 Atrium One, 11811 I-10 East, Houston, TX 77029
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 Linwood Avenue, Ft. Lee, NJ 07024
Butterworth Systems Inc., 224 Park Ave., Florham Park, N.J. 07932
National Marine Service, Inc., 1750 Brentwood Blvd., St. Louis, MO 63144
Sigma Treatment Systems, Merry Meadows, RD 1 Box 70, Chester Springs, PA 19425

PAINTS—COATINGS—CORROSION CONTROL
American Abrasive Metals, 460 Coit Street, Irvington, NJ 07111
Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754
"CONSOL" manufactured by Hanline Bros., Inc., 1400 Warner St., Baltimore, MD 21230
Devoe Marine Coatings Co., P.O. Box 7600 Louisville, KY 40207
E.I. Dupont De Nemours & Co., Inc., Nemours Bldg. Rm. N-2504-2, Wilmington, DE 19898
Eureka Chemical Company, 234 Lawrence Ave., So. San Francisco, CA 94080
Henkel Corporation, 4620 West 77th Street, Minneapolis, MN 55435
International Paint Co., 17 Battery Place North, Suite 1150, New York, N.Y. 10004
Jotun-Baltimore Copper Paint Co., 840 Key Highway, Baltimore, MD 21230
Mobay Chemical Corporation, Plastics & Coatings Div., Pittsburgh, PA 15205
Mobil Chemical Co., Maintenance & Marine Coatings Dept., P.O. Box 250, Edison, N.J. 03817
Palmer Products Inc., P.O. Box 8, Worcester, PA 19490
Selby, Battersby & Company, 5220 Whiby Avenue, Philadelphia, PA 19143

PETROLEUM SUPPLIES
Houston Marine Services, Inc., 505 Atrium One, 11811 I-10 East, Houston, TX 77029
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002

PIPE-HOSE—Cargo Transfer, Clamps, Couplings, Coatings
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., 2-47, Shikit Suhigashi 1-Chome, Naniwa-Ku, Osaka 556-91, Japan
Penco Division Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030
Sanchem, Inc., 1600 South Canal Street, Chicago, IL 60616
Tioga Pipe & Supply Company, 2450 Wheatsheaf Lane, Philadelphia, PA 19137

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
Armco Steel Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150
Bird Johnson Company, 110 Norfolk St., Walpole, Mass. 02081
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Centrico, Inc., 100 Fairway Court, Northvale, NJ 07647
Colt Industries' Fairbanks Morse Engine Division, Beloit, Wisc. 53511
Combustion Engineering, Inc., Windsor, Connecticut 06095
General Electric Co., Diesel Power Products, 2901 E. Lake Rd., Erie, PA 16531
Kawasaki Heavy Industries, Ltd., 2-4-1 Hamamtsu-cho, Minato-ku, Tokyo, Japan
Krupp Mak Diesels, Inc., 9701 West Higgins Road, Rosemont, IL 60018
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
Omnithruster Inc., 15418 Cornet Ave., Santa Fe Springs, CA 90670
Oosterhuis Industries, Inc. (Marine Engineering, Inc.), P.O. Box 30587, New Orleans, LA 70190
P.J. Plishner Marine, 2 Lake Avenue Ext., Danbury, CT 06810
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
Steamco Corporation, 1020 East 8th Street, Jacksonville, FL 32206
Tacoma Boat Co. Escher Wyss, 1840 Marine View Dr., Tacoma, WA 98422
Transamerica DeLaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621
Transamerica Delaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, N.J. 08650
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
Waukesha Engine Division, Waukesha, WI 53187

PUMPS—Repairs—Drives
Barco Corporation, 16 Bahama Circle, Tampa, FL 36606
Penco Division Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030
Transamerica Delaval, IMO Pump Division, P.O. Box 447, Monroe NC 28110
Worthington Group-McGraw Edison Co., 270 Sheffield Street, Mountainside, NJ 07092

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

ROPE—Manila—Nylon—Hawsers—Fibers
American Mfg. Co., Inc., Willow Avenue, Honesdale, Pa. 18431
Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008
Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110

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
Modular Systems, 164 Franklin Avenue, Rockaway, NJ 07866
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

SAFETY EQUIPMENT
ACR Electronics, Inc., 3901 North 29th Avenue, Hollywood, FL 33020
Datrex, 3795 N.W. 25th Street, Miami, FL 33142

SANITATION DEVICES—Pollution Control
American United Marine Corp., 575 Madison Avenue, New York, NY 10022
Argo Marine Pollution Systems Division, 140 Franklin St., New York, N.Y. 10013
Chapman Engineers (Omnipure Division), 6101 Southwest Freeway, Suite 100, Houston, TX 77057
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
St. Louis Ship FAST Sewage Systems, 611 East Marceau St., St. Louis, Mo. 63111
Somat Corporation, Pomeroy, PA 19367

SCAFFOLDING EQUIPMENT—Work Platforms
Patent Scaffolding Co., 2125 Center Ave., Fort Lee, N.J. 07024

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

SHAFT SEALS, REVOLUTION INDICATOR EQUIPMENT
Bird-Johnson Co., 100 Norfolk St., Walpole, MA 02081
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
The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

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

SHIPBUILDING—Repairs, Maintenance, Drydocking
A.D.M. (Amsterdam Drydock Mfg.), Maatschappij bv, P.O. Box 3006, 1003 AA, Amsterdam, Holland
AMT, Inc., 2400 N.W. 39th Avenue, Miami, FL 33142
Asmar Shipyards Co., Astilleros y Maestranzs de la Armada, Prat 856, Piso 14, Casilla 150-V, Valpariso, Chile, S.A.
Astilleros Espanoles S.A., 17 Padilla, P.O. Box 815, Madrid, Spain
Astilleros Unidos de Veracruz, S.A., San Juan de Ulua S N, Apdo. Postal 647, Verarruz, Ver., Mexico
Atlantic Marine Inc., P.O. Box 138 Ft. George Island, Jacksonville, FL 32226
Avondale Shipyards, Inc., P.O. Box 52030, New Orleans, La. 70150
Bay Shipbuilding Corporation, 605 North Third Avenue, Sturgeon Bay, WI 54235
Bender Shipbuilding & Repair, P.O. Box 42, Mobile, AL 36601
Bergeron Industries Inc., P.O. Box 38, St. Bernard, La. 70085
Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004
Blohm & Voss Company, 55 Morris Avenue, Springfield, NJ 07081
Bludworth Bond Shipyard Inc., P.O. Box 5065, Houston, TX 77012
Boeing Marine Systems, P.O. Box 3707, Mail Stop 14-11, Seattle, WA 98124
Cantieri Navali Riuniti, Via Cipro, 11, 16100 Genova, Italy
Carrington Slipways Pty, Ltd., Old Punt Road, Tomago, N.S.W., Australia 2322
Centromor, 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
Conrad Industries, P.O. Box 790, Morgan City, La. 70390
Curacao Drydock Company Inc., 26 Broadway, Suite 741, New York, NY 10004
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
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 Barae, 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 Shipbuilders, Inc., P.O. Box Q, Pascagoula, MS 39567
Jeffboat, Inc., Jeffersonville, Ind. 47130
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
Marine Fabricators, P.O. Box 246, Green Cove Springs, FL 32043
Matton Shipyard Co., Inc., P.O. Box 645, Cohoes, New York 12047
Midland Marine Corporation, One Pennsylvania Plaza, New York, NY 10001
Misener Industries, Inc., 5353 Tyson Avenue, P.O. Box 13625 Tampa, Fla. 33681
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
O.A.R.N. (Officine Allestimento-Riprazioni Navi), P.O. Box 1395 Genoa, Italy 16100
Paceco Inc. (A division of Fruehauf), West Seaway Access Road, Gulfport, MS 39501
Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, Fla 33156
Port Allen Marine Service, Inc., P.O. Box 108, Port Allen, LA 70767
Progressive Shipbuilders & Fabricators, Inc., P.O. Box 9130, Houma, LA 70361
Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22
St. Louis Shipbuilding—Federal Barge, Inc., 611 East Marceau, St. Louis, Mo. 63111
Savannah Shipyard Co., P.O. Box 787, Savannah, GA 31402
Southwest Marine, Inc., P.O. Box 13308, San Diego, Ca 92113
Sudoimport, 5 Kalyaevskaya, Moscow K-6, USSR
Sun Ship Inc., Chester, PA 19013
Swiftships Inc., P.O. Box 1903, Morgan City, LA 70380
Tacoma Boatbuilding Co., Inc., 1840 Marine View Drive, Tacoma, WA 98422
Tandanor (Piacentini), Antartida Argentina 555 Darsena Norte, (1104) Buenos Aires-Republica Argentina
Thomas Marine Inc., 37 Bransford Street, Patchogue, NY 11772
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
West Coast Salvage And Contracting, 2150 East Kent Avenue, Vancouver, B.C. V5P 2T2

SHIPPING—PACKING
Candia Shipping (USA) Inc., One World Trade Center, Suite 1611, New York, NY 10048
Crane Packing Co., 435 Regina Drive, Clarksburg, MD 20734

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
Environmental Chemicals, Inc., 487 Division Street, Boonton, NJ 07005
Penco Division Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030
Salwico, Inc., 5 Marine View Plaza, Hoboken, NJ 07030

TANK LEVELING INDICATORS
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062
Vitronics, P.O. Box 42305, Houston, TX 77042
Vu-Gage System, 150 E. 42nd St. (Room 910), New York, NY 10017

TERMINALS—Oil-Transfer
Caicos Petroleum Services Div., Federal Chicago Corp., 2222 North Elston Avenue, Chicago, IL 60614

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
Great Lakes Towing Company, 1800 Terminal Tower, Cleveland, OH 44113
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
Ocean Salvors Company, One World Trade Center, New York, NY 10048
Smit International (Americas) Inc., 17 Battery Place, New York, NY 10004
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

TRAINING SERVICES—Simulator
Ship Analytics, Park Circle, Centerport, NY 11721

VALVES AND FITTINGS
American United Marine, 575 Madison Avenue, New York, NY 10022
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
Parker-Hannifin Corporation, 17325 Euclid Avenue, Cleveland, OH 44112
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
Winel, Inc., 34655 Mills Road, North Ridgeville, OH 44039
Zidell Explorations, Inc., (Valve Division), 3121 S.W. Moody Avenue, Portland, OR 97201

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

WINCHES AND FAIRLEADERS
Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134
Smith-Berger Manufacturing Corporation, 3236 16th Avenue S.W., Seattle, WA 98134

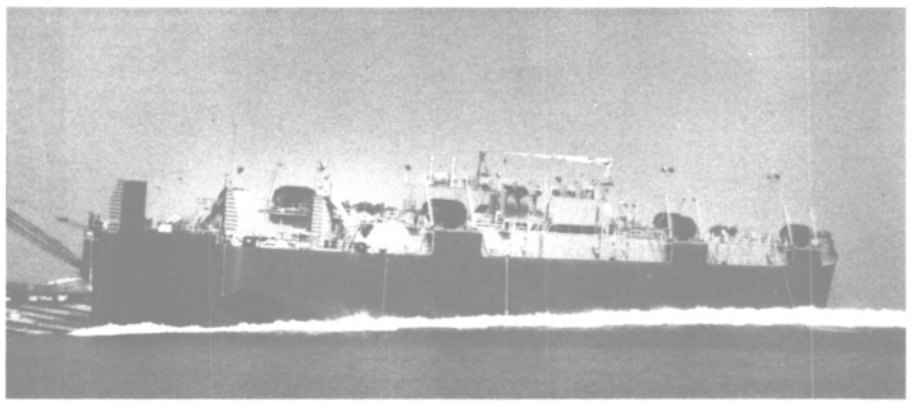
WINDOWS
Kearfott Marine Products, A Singer Co., 550 South Fulton Avenue Mt. Vernon, N.Y. 10550

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
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004
A.L. Don Company, Foot of Dock Street, Matawan, NJ 07747

ZINC
Smith & McCrorken, 153 Franklin St., New York, N.Y. 10013

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



Marathon Oil Bunkering Barge Launched At Galveston Shipbuilding

A 442-foot oceangoing barge (shown above) with a capacity of 19,950 metric tons was recently launched at Galveston Shipbuilding's facility on the north side of Galveston Island, Texas.

The 150,000-barrel vessel, owned by Marathon Marine, a Marathon Oil subsidiary, is one of two identical deep-notched barges being constructed by Galveston Shipbuilding for employment in bunkering of very large tankers at the Louisiana Offshore Oil Port (LOOP), 20 miles offshore from Grand Isle, La., in the Gulf of Mexico.

The barges, being classed by the American Bureau of Shipping, are to be entitled to the highest class for vessels of this type for unrestricted ocean service. They are equipped with circulating hot oil cargo heating systems, bow thrusters and equipment for blending different grades of fuel oil to satisfy each customer's requirement. The vessels will also carry fresh water, lubricating oil, and other ship's stores to fulfill the needs of the visiting crude oil carriers — in other words, barges MM-1 and MM-2 will function as floating mobile service stations.

The two big tank barges, to be home ported at Marathon's Garyville, La., refinery, will be push-towed by 7,200-horsepower tugs which have been specially configured for this service.

Bird-Johnson Awarded Propeller Contract For Spanish Navy

Bird-Johnson Company, Walpole, Mass., has been awarded a contract by Empresa Nacional Bazan, El Ferrol del Caudillo, Spain, for three shipsets of FFG controllable-pitch propellers and shafting. These propellers will be identical to the ones Bird-Johnson manufactured for the U.S. Navy's 50-ship FFG-7 guided missile frigate program.

Empresa Nacional Bazan is building three ships for the Spanish Navy, and in addition to the contract with Bird-Johnson Company, the Spanish shipyard has a contract with Bath Iron Works, Bath, Maine, for procurement assistance and production support. Two shipsets of the Bird-Johnson propellers are scheduled for delivery in November 1983; the third and final shipset will be delivered in May of 1984.

Approve $3.8-Million MarAd Title XI Guarantee For 188-Foot Pipelay Barge

Acting Maritime Administrator **Bruce McAllister** recently approved in principle an application from Pipelines, Inc. of Harvey, Maurice, La., for a Title XI guarantee to aid in financing a combination pipelay/bury derrick barge. The 188-foot barge was built by Houma Fabricators, Inc., Harvey, La., and was delivered last March.

It is anticipated the vessel will operate primarily in the Gulf of Mexico. The approved guarantee is for $3,836,000, or up to 75 percent of the barge's estimated depreciated actual cost.

Navy Auxiliary Propulsion Contracts Awarded To Louis Allis

Multimillion-dollar contracts for six auxiliary propulsion systems for the U.S. Navy's FFG-class guided missile frigates have been recently received by the Louis Allis Division of Litton Industries, Milwaukee, Wis.

Three systems are to be delivered to Bath Iron Works, Bath, Maine, two are to go to Todd Pacific in San Pedro, Calif., and one to Todd Pacific in Seattle, Wash. The auxiliary propulsion system can move the ship sideways and, though not designed as a bow-thruster, can control both bow and angular movement.

Approve $16-Million MarAd Title XI Guarantee For Coal-Carrying Barge

The Maritime Administration has approved the award of contracts totaling nearly $27 million for the retrofitting of pollution abatement and safety equipment aboard four tankers and two ore/bulk/oil (OBO) vessels owned by subsidiaries of the Berger Group, Lake Success, N.Y. The retrofits are needed to bring the ships into compliance with the Port and Tanker Safety Act of 1978.

Under MarAd's construction-differential subsidy (CDS) program, $13.9 million of the contract cost will be borne by the government. The work will be done by Jacksonville Shipyards, Jacksonville, Fla. It will include installation of crude oil washing systems, inert gas systems with independent gas generating plants, and pollution monitoring systems.

Jacksonville's negotiated fixed price for the reconstruction of each of the 91,800-deadweight-ton (dwt) tankers American Heritage and Golden Monarch is $4,907,550. The price for work on each of the similarly sized tankers Golden Dolphin and Golden Endeavor is $4,754,307. The fixed price is $3,815,021 for work on each of the 83,200-dwt OBOs Ultrasea and Ultramar.

The CDS approved for this work is approximately 46 percent of the total cost of the retrofits. This represents the difference between the fixed price and the estimated cost of performing the work in a foreign yard. (Japan/Singapore was used as the representative foreign shipbuilding center to establish the foreign costs of retrofitting the six Berger vessels.)

In addition to the CDS, the federal government will pay $1,450,000 for the installation of national defense features on all six vessels.

National Steel & Shipbuilding Co., San Diego, Calif., built the vessels. The Ultramar was delivered in 1973, the Golden Dolphin and Ultrasea in 1974, the Golden Monarch in 1975, the American Heritage in 1976, and the Golden Endeavor in 1977.

$35.8-Million Contract Awarded To Build New Lock On Gulf Waterway

The U.S. Army Corps of Engineers has awarded a $35.8-million contract to Williams Brothers Construction Company, Inc. of Houston, Texas, to construct a new lock on the Gulf Intracoastal Waterway, according to Col. **Robert C. Lee**, district engineer of the Corps' New Orleans District.

A groundbreaking ceremony to begin construction of the new lock replacing the 48-year-old Vermilion Lock was held recently at the existing lock, located about 15 miles southwest of Abbeville. The ceremony was sponsored by the Gulf Intracoastal Canal Association, the Vermilion Parish Police Jury, and the Louisiana Intracoastal Seaway Association.

The new lock will be built slightly south and to the west of the existing structure. The purpose of a lock is to prevent salt water that enters the GIWW from the Gulf of Mexico from intruding into the Mermentau River basin. Fresh water from the Mermentau basin is needed for irrigation and for game management areas.

The new lock will be 110 feet wide, 1,200 feet long, and 15 feet deep at the sill. The dimensions of the existing lock are 56 feet wide, 1,182 feet long, and 11.3 feet deep. The new structure will have standard sector gates, reportedly more efficient and sturdier than the hinged gates of the old lock, which has become a hindrance to efficient passage of traffic because of its size and the difficulty of repairing and replacing damaged parts after accidents.

The construction contract calls for channel excavation, replacement of the bridge across Bayou Chene, an access road, administration buildings, and a visitors' stand.

In related Corps news, the 37-mile-long stretch of the GIWW between the Vermilion and Mermentau Rivers in southwest Louisiana will be restored to its design depth of 15 feet, under terms of a $2,569,500 maintenance dredging contract signed recently between the Corps and Mike Hooks, Inc. of Lake Charles, La.

The contractor will take almost seven months to remove some 3,825,000 cubic yards of shoal material from the heavily used east-west waterway.

Megasystems Combustion Analysis Systems Ordered By Phillips

Phillips Petroleum Company of Bartlesville, Okla., as agents for Philtankers Inc. of Panama, recently ordered six model MS-2500 combustion analysis systems from Megasystems, Inc. of Boca Raton, Fla. and Cleveland, Ohio. These "top of the line" units feature free-standing console, magnetic cassette data storage, and large CRT display.

The magnetic tape data storage feature provides the operator with a means of recording either combustion waveforms or injection waveforms on the magnetic tape or on a graphic paper printout. This means that they can view the cylinder conditions at a later date. Tapes can be forwarded to the Phillips home office where they can be reviewed by the shoreside engineering staff.

The MS-2500 units will be installed aboard the 53,000-dwt motor tankers Phillips Arkansas, Phillips Mexico, Phillips Oklahoma, Phillips Venezuela, World Freeport and World Texas. These ships were delivered in 1980, and represent all of the diesel-powered vessels in the Phillips fleet.

For a free copy of literature on Megasystems MS-2500 combustion analysis systems,

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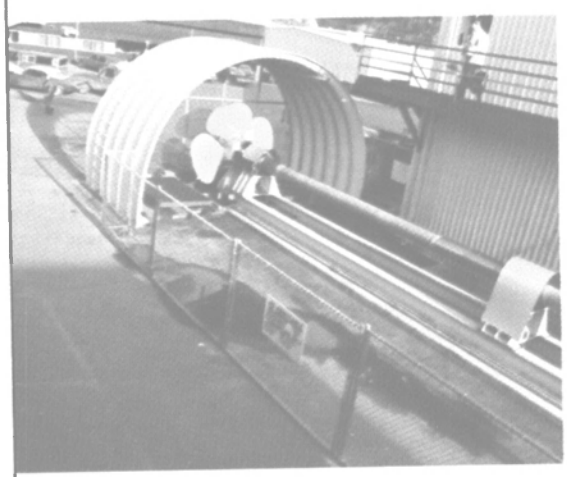

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