MARITIME REPORTER
AND
ENGINEERING NEWS

HMAS Tobruk

Australian Navy Heavy-Lift Ship—Largest Launched At Carrington Slipways
(SEE PAGE 10)

SNAME Spring Meeting And Star Symposium
(SEE PAGE 44)

MAY 1, 1980

IF OUR REFERENCE LIST DOESN'T IMPRESS YOU, OUR INCINERATOR OG 400 WILL.

These shipowners are only a few of about 100 who have chosen a GOLAR MARINE INCINERATOR:

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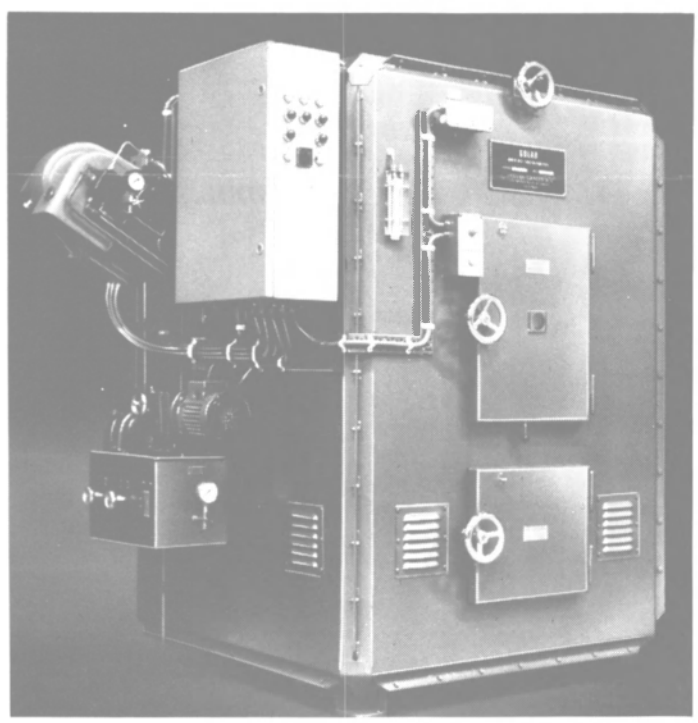
For more than 6 years GOLAR MARINE INCINERATORS have been in continuous operation, and more than 350 plants have been sold and installed.

The type OG 400 is considered the most convenient Marine Incinerator on the market today, due to Small Overall Dimensions, High Capacity, Simple and Reliable Operation, Easy to Install and Maintain.



Heat Capacity: 500.000 kcal/hr. Sludge oil: 80 litres/hr.
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Pulling Together In Philadelphia

Two companies, Independent Towing Co. and McAllister, each with over 100 years of towing experience, join to provide an expanded harbor service in Philadelphia.

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MarAd Will Sponsor Coal-Firing Seminar

The U.S. Maritime Administration will hold a seminar on "Coal-Firing Technology for the Maritime Fleet" on May 19, 1980, at the Seamen's Church Institute in New York City.

"The enormous increases in ships' fuel costs and the increasing dependence on foreign oil has spurred interest in conservation techniques and alternative fuels in the U.S. maritime industry," said **Marvin Pitkin,** the agency's assistant administrator for commercial development.

The seminar will discuss the economics and thermodynamics of coal-firing, and will draw upon experiences of electric utilities and vessel operators. Speakers will include representatives of naval architecture firms, shipping companies, utilities and MarAd.

Reservations may be made through May 16 by contacting ADI Transportation Systems, 280 Crossways Park Drive, Woodbury, N.Y. 11798; (516) 364-0498. A $20 fee includes all materials and a luncheon. The meeting is scheduled to run from 8:30 a.m. to 5:00 p.m.

Lobster Boat To Be Designed By Blancke

A contract for the design of an 82-foot offshore lobster pot and longline boat has been signed between Blancke Marine Services of Westville, N.J., and Yank Boat Works.

The all-aluminum vessel is designed in accordance with American Bureau of Shipping Rules, with length overall of 82 feet, beam of 23 feet, depth of 12 feet, and full-load draft of 6 feet 3 inches. Crew accommodations are for six, with a separate captain's cabin.

Refrigerated seawater capacity is 5,770 gallons. To assure the highest percentage of live catch, an air injection system has been designed into the lobster tanks.

Two Cummins KT 1150 diesel engines with internal heat exchangers provide propulsion power, driving Aquamet-17 shafts through a 3.5:1 reduction gear. Two General Motors 30-kw generators provide electric power. These are capable of being paralleled automatically. The steering system is electro-hydraulic by Wagner.

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

Queen of liners returns to King of drydocks

The beautiful QE2 is 963 ft long, 105 ft wide, and draws 32-1/2 ft of water. The big Bayonne graving dock measures 1,100 x 140 ft, and shows 40 ft of water over the blocks at mean high tide.

BAYONNE, NEW JERSEY—It's deep enough, long enough and wide enough to engage the QUEEN ELIZABETH 2, world's largest active passenger liner. It's the former Navy drydock, operated by Bethlehem, located at the Military Ocean Terminal in New York Harbor. Bethlehem leases this drydock and adjacent facilities from the U.S. Government and operates it as an integral part of our repair yard at Hoboken, a few miles north on the Jersey shore.

This visit of the QE2 was for her annual overhaul —plus extensive boiler and propeller work, and a wide variety of repairs and modifications throughout the ship. It was the third time in as many years she has come to Bethlehem for servicing. With our expertise in all phases of repair and our demonstrated ability to perform on schedule, we look forward to retaining her favor.

BethShip BETHLEHEM STEEL

Bethlehem Steel—Shipbuilding

Ship Repair Sales: One State St. Plaza, New York, NY 10004
Cables: BETHSHIP New York • Telex: 222-847 or 421-604 • Phone: (212) 558-9500

Drydocks in Baltimore, New York, Boston, Los Angeles, and San Francisco Harbors, and at Beaumont, Texas.

American Trading Asks Title XI For Six Tankers Costing $408 Million

A proposal to construct six 50,000-dwt oil tankers has been announced by American Trading and Transportation Company of New York City. Through individual subsidiaries designated Attransco Tanker Corporation I through VI, American Trading has requested Title XI construction loan and mortgage insurance from the Maritime Administration.

National Steel and Shipbuilding Company of San Diego is the proposed builder of the diesel-powered vessels, which have a total estimated cost of $408 million. Delivery of the first ship would be scheduled for September 1982, the second and third by the end of November 1982, and March 31, 1983; delivery of the last three has not been indicated.

Crewboat Richard Hill is one of two delivered recently by Halter Marine's Chalmette, La., yard to P.T. Bailey, Inc. of Morgan City, La. Each boat has a capacity for up to 55 passengers, and a range of 500 miles.

Halter Delivers Two Large-Capacity Crewboats

Halter Marine, Inc., New Orleans, La., recently delivered two of its new long-deck 101-foot crewboats to P.T. Bailey, Inc. of Morgan City, La.

The Richard Hill and Steve Partain sport 55-foot-long clear deck areas capable of carrying more than 30 tons of cargo. The deck is 17 feet wide. Other dimensions include a 21-foot beam, 9½-foot depth and 5½-foot draft.

Each crewboat can also transport up to 55 passengers. A complete galley, mess area and three double-berth staterooms are provided for the crew or for long-haul operations.

A spacious engine room houses three GM12V71TI diesels rated at 510 bhp each to give the aluminum vessel a time trial speed of more than 28 mph. The propulsion engines turn three bronze four-bladed propellers through Twin Disc MG-514 reverse reduction gears with a 2:1 ratio.

A 500-mile range is possible with the vessels' 2,400-gallon fuel oil capacity. Each also carries 500 gallons of potable water.

Two GM3-71-driven 30-kw generators provide electric power for ship's services and wheelhouse electronics which include a Decca 110 radar and Motorola VHF and SSB radios.

The Richard Hill and Steve Partain were built by Halter Marine's Chalmette, La., division, one of 10 shipyards owned and operated by Halter in the Southeastern United States.

Transamerica Delaval, Research-Cottrell Form Joint Venture

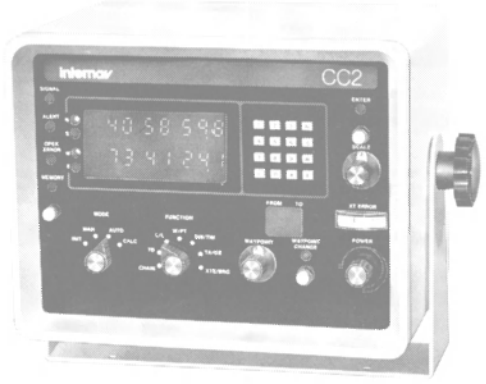
Research-Cottrell, Inc., Somerville, N.J., and Transamerica Delaval Inc., Princeton, N.J., have formed a joint venture to address the energy utilization markets. The announcement was made by **John E. Schork**, chairman and chief executive officer of Research-Cottrell, and **D.T. Bixby**, president of Transamerica Delaval, a subsidiary of Transamerica Corporation, San Francisco, Calif.

The joint venture will develop and commercialize products and systems based on the two-phase turbine technology of Biphase Energy Systems, Santa Monica, Calif., one of the Research-Cottrell Energy Companies. In forming the joint venture, Transamerica Delaval paid to Research-Cottrell and contributed to the joint venture $6.5 million in cash at closing.

The Research-Cottrell / Transamerica Delaval partnership, established on a 50-50 basis, will market systems for power generation and energy utilization, particularly for geothermal waste heat, desalination, and marine propulsion applications. The venture will combine the engineering, marketing and manufacturing capabilities of Transamerica Delaval in high-speed rotating equipment with the marketing and systems engineering expertise of Research-Cottrell in energy and environmental control products and services.

Simrad. A trusted name at sea.

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

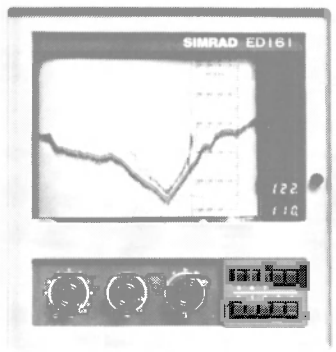


Simrad's CC-2 Navigation Computer gives complete position, steering and piloting information in an easy-to-use system. It is still the only separately packaged Loran C navigation computer, and can accept input data from any Simrad Loran C receiver.

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

New digital recording sounders meet IMCO requirements.

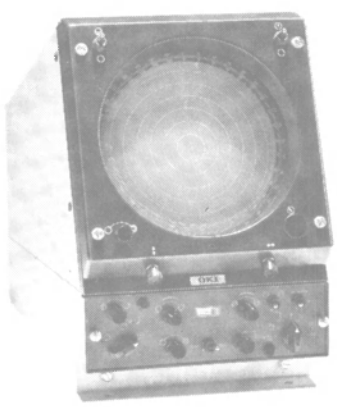
Simrad now offers two economical navigation recording echosounders that meet IMCO recommendations for merchant vessels. In addition to showing a well-defined bottom on recording paper, the systems have independent digital depth indicators and depth alarms. The Simrad ED-161 has four recording ranges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



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

Ship's radar from Simrad.

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



(5KW) with choice of 3 or 4 foot slotted array antenna, and all electronic scope sweep, is recommended.

Loran C means Simrad.

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

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

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

SIMRAD

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

Shown at the signing ceremony, from left (seated): **C.N. Watson,** managing director of Sembawang Shipyard; **Z. Umeda,** president of Kawasaki Heavy Industries; **Lee Ek Tieng,** chairman of Sembawang Shipyard; and **H. Kametani,** director of Kawasaki Heavy Industries.

Sembawang Yard To Invest In Construction Of New Floating Dock

As part of an extensive expansion program, the Government-owned Sembawang Shipyard in Singapore recently began construction of a new floating dock. Scheduled for completion by mid-1981, the floating dock will be the largest in the East, and able to accommodate ships up to 150,000 deadweight tons.

Major international shipyards were invited to tender for its design and construction, and the contract was awarded to Kawasaki Heavy Industries Ltd. of Japan on a competitive quotation/delivery basis.

The total investment involved in the new dock, along with all the necessary back-up facilities, is Sing $70 million. The construction of the dock will represent about two-thirds of the total. However, when the dock becomes fully operational, Sembawang expects it to increase turnover by about a third on present levels.

The dock will be of one-piece construction, with continuous and inseparable bottom caisson and two side walls fully closed. The end platforms are to be fitted at fore and aft of the dock, and each side wall to consist of service spaces at upper part and ballast tanks at lower part divided by a safety deck. The principal dimensions are 290 meters length overall (about 951.5 feet); 270 meters length over caisson (885.8 feet); 51 meters width between inner walls (167.3 feet), and 8.5 meters depth over keel blocks (27.9 feet). The lifting time of the dock will be approximately two hours.

Special features include remote control of the pumping/ballasting operations, sonic system for guidance of vessel entering dock, and a ring main for automatic high-pressure freshwater cleaning of a hull. In addition, the dock will be equipped with four units of highly versatile dock-arms, each with a maximum payload of 400 kg. (880 pounds). Two traveling dock cranes of 50-ton and 15-ton capacities will be installed, together with the inclusion of the hauling-in system.

In conjunction with the new floating dock project, the existing access ramp, designed and constructed for standard 20-ton truck loading, pedestrians and impact load, will be extended to reach the new dock. This allows easier access for supplies and services to the new dock. At the same time, the new dock will also be equipped with ship-repair facilities for ships berthed along its starboard side.

Oil Mop Gets $4-Million Order From Saudi Arabia

Kelvin J. Smythe, president of Oil Mop, Inc., New Orleans-based pollution control equipment manufacturer and service, has announced signing of a contract worth $4 million with the Saudi Arabian Ports Authority for oil spill recovery and control equipment.

Principal items in the contract are three 15-meter (49.2-foot), GM-powered semi-catamaran vessels fitted with Oil Mop mop engines and rope mop recovery systems, and one 18-meter (59-foot), single-hull GM-powered vessel fitted with two vortex type oil skimmers, chemical dispersants, and provisions for training Saudi Arabian personnel in the operation of the four vessels.

The four vessels will be built in the New Orleans, La. area by an as yet undesignated shipbuilder, with completion scheduled within one year.

Amphibious heavy-lift ship HMAS Tobruk was side-launched into a specially constructed basin at Carrington Slipways in Tomago. Commissioning of the Royal Australian Navy ship is expected in October of this year.

Australian Navy Heavy-Lift Ship Launched At Carrington Slipways

The Governor General of Australia, Sir **Zelman Cowen**, and **Lady Cowen** were present at the launching of the Royal Australian Navy's HMAS Tobruk, at Carrington Slipways Pty. Ltd.'s shipyard at Tomago, recently.

Lady Cowen named and launched the $36-million amphibious heavy-lift ship during a traditional ceremony attended by service and Department of Defence personnel, local government officials, VIPs and shipyard workers.

Representatives of the three defense forces included the Chief of Naval Staff, Vice Adm. **G.J. Willis**, the G.O.C. Field Force Command, Major Gen. **J.I. Williamson**, and the Officer Commanding R.A.A.F. Base Williamtown, Air Commodore **W.H. Simmonds**.

The HMAS Tobruk, at 6,000 tons and 126 meters long (about 413 feet), is the largest ship built by Carrington Slipways. She was launched sideways into a specially constructed basin which was dredged from shipyard land beside the Hunter River.

The basin is a small inland lake with a bank of earth barring access to the river. More than a meter of water was pumped into the basin to raise the level of water for the launching.

Major construction work on the ship has been completed, and fitting out will continue while the Tobruk is in the basin. The river bank will be broken when the vessel is ready for sea trials. Commissioning is expected to take place in October this year.

The Tobruk's commanding officer will be Comdr. **K.A. Doolan**.

Delaware Valley ASNE Discusses Computer Modeling And Ship Performance

A recent meeting of the Delaware Valley Chapter, American Society of Naval Engineers, was held at the Officers Club, U.S. Naval Base, Philadelphia, Pa.

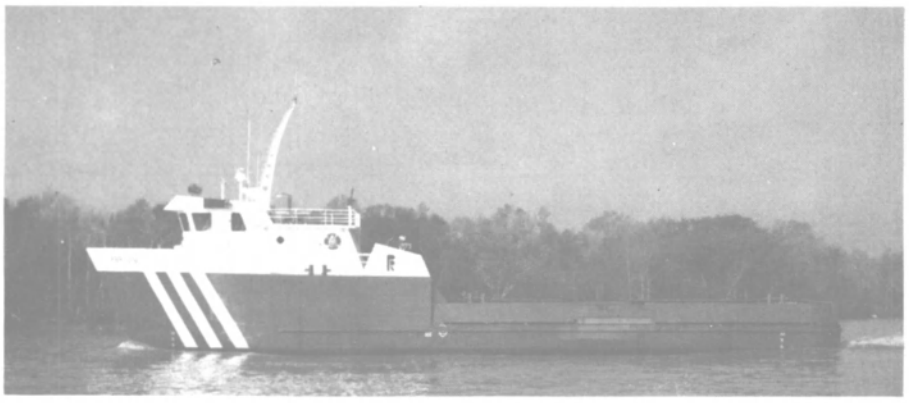
The technical session was opened by meeting coordinator Lt. Comdr. **C.E. Jones**, Philadelphia Naval Shipyard, who introduced Comdr. **J.S. Smith**, Philadelphia Naval Shipyard, author of the evening's paper that was entitled "Computer Modeling and Ship Performance."

The author traced the development of modeling techniques to simulate combat system performance in an installed shipboard environment. The development started in 1972, and has expanded in capability to the point where performance-oriented, topside design synthesis can be accomplished using real time and CRT interfaces. Commander **Smith** was the branch head of NAVSEC 6174 when development began, and has maintained his interest in this vital combatant ship design tool through the years.

Capt. **Ray Pierce**, chairman of the Delaware Valley Chapter, presented Commander **Smith** with a Certificate of Appreciation, and announced that Commander **Smith** has been promoted and is leaving the Philadelphia area for reassignment in the Washington, D.C. area.

Attending recent ASNE Delaware Valley Chapter meeting were (left to right): **E.P. Weinert**, vice chairman; Capt. **R.E. Pierce**, chairman; Comdr. **J.S. Smith**, secretary-treasurer; **J.E. Deal**, Sanders and Thomas, Inc., and Lt. Comdr. **C.E. Jones**, meeting coordinator.

Utility Vessel And Tugboat Delivered By Service Machine Group



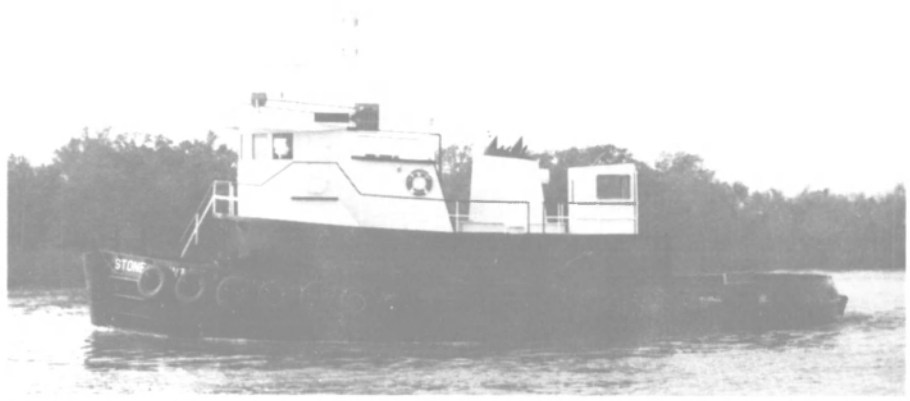
Offshore utility vessel PBR-216 is first of six being built by Service Machine Group for PBR Offshore, Inc.

Two new workboats — the offshore utility vessel PBR-216 and the tug Stone Mountain — were completed recently by The Service Machine Group, Inc. of Morgan City, La.

The PBR-216, built for PBR Offshore, Inc. also of Morgan City, has an overall length of 118 feet, beam of 26 feet, depth of 11.5 feet and draft of 10 feet. Cargo water capacity is 58,000 gallons, fuel oil capacity is 30,000 gallons, and deck cargo load is 103 tons, with additional below-deck capacity of 217 tons.

She is powered by two General Motors 16V-92N diesel engines with a total of 1,200 bhp, supplied by George Engine Company, driving Twin Disc 5:1 reduction gears for a speed of 12 knots. Electric power is provided by two GM4-71N engines driving 50-kw generators.

Additional equipment includes a Sitex Model 22 radar, a Motorola 55/75 VHF radio, a Drake



Tugboat Stone Mountain was delivered recently by Service Machine to Black Towing Company.

TRM-115 SSB radio, an SRD Model CLX Loran, and a Datamarine Model 2650 depth finder.

The PBR-216 is the first of six sister vessels being built for the same owner. Service Machine will deliver the remaining five during 1980.

The second recent delivery was the tugboat Stone Mountain, built for Black Towing Company of Morgan City. The 75-foot vessel has a free-running speed of about 12 knots, provided by twin GM-16V-92N diesels driving 64-inch bronze propellers supplied by Rice Propellers through Twin Disc 5:1 reduction gearing.

A Smatco towing/anchor handling winch provides a line pull of 50,000 pounds. Skipper, Inc. provided the hydraulic steering units, two air compressors came from Quincy, and the Barnes bilge/ballast/fire pump and the sanitary and potable water pressure sets were supplied by Pump Systems, Inc.

Electronic gear in the Stone Mountain include Sitex radar, Drake SSB radio, two Motorola VHF radios, Datamarine depth finder, and Texas Instrument computer-controlled Loran.

Merit Drilling Seeks Title XI For Drill Barge Costing $10.5 Million

Merit Three Drilling, Ltd., a subsidiary of Merit Drilling of Houston, has applied to MarAd for a Title XI guarantee to aid in financing the construction of a shallow-water drill barge. Red Fox Industries, New Iberia, La., is the proposed builder.

If approved, the Title XI guarantee would cover $7,875,000, or 75 percent of the total actual cost of $10,500,000.

Grand Bassa Tankers Names Naval Architect

Robert C. Morrell has become affiliated with Grand Bassa Tankers, Inc. of Tulsa, Okla., as naval architect.

For the past 32 years, Mr. **Morrell** has been a consulting naval architect in New York City. He is a naval architecture graduate of The University of Michigan.

Grand Bassa is the owner of 10 seagoing tankers totaling about 1,200,000 deadweight tons.

Promotions And Retirements At El Paso LNG Company

The El Paso Company of Houston, Texas, has announced that **George D. Carameros Jr.,** chairman, and **Barry Hunsaker,** president of El Paso LNG Company, a subsidiary, have elected to take early retirement to pursue other interests in the energy field. They will continue to be available as required in a consulting capacity for a period of time after their retirement. Mr. **Carameros** and Mr. **Hunsaker** each have been employed by El Paso for over 32 years, and have been with the LNG subsidiary from its inception.

Travis H. Petty, chairman of The El Paso Company, will also become chairman and president of El Paso LNG Company. **Virgil R. Cowart** and **Martin R. Engler Jr.** were named executive vice presidents of this subsidiary, and will report to Mr. **Petty**.

Mr. **Cowart,** who is based in Paris, France, joined El Paso in 1953. He was part of the original complement of El Paso's French subsidiary formed in 1960, and was named managing director of that subsidiary in 1965. Mr. **Cowart** has also been with the LNG subsidiary since its inception, and became a vice president in 1975, and in 1977 was named a senior vice president, his most recent position.

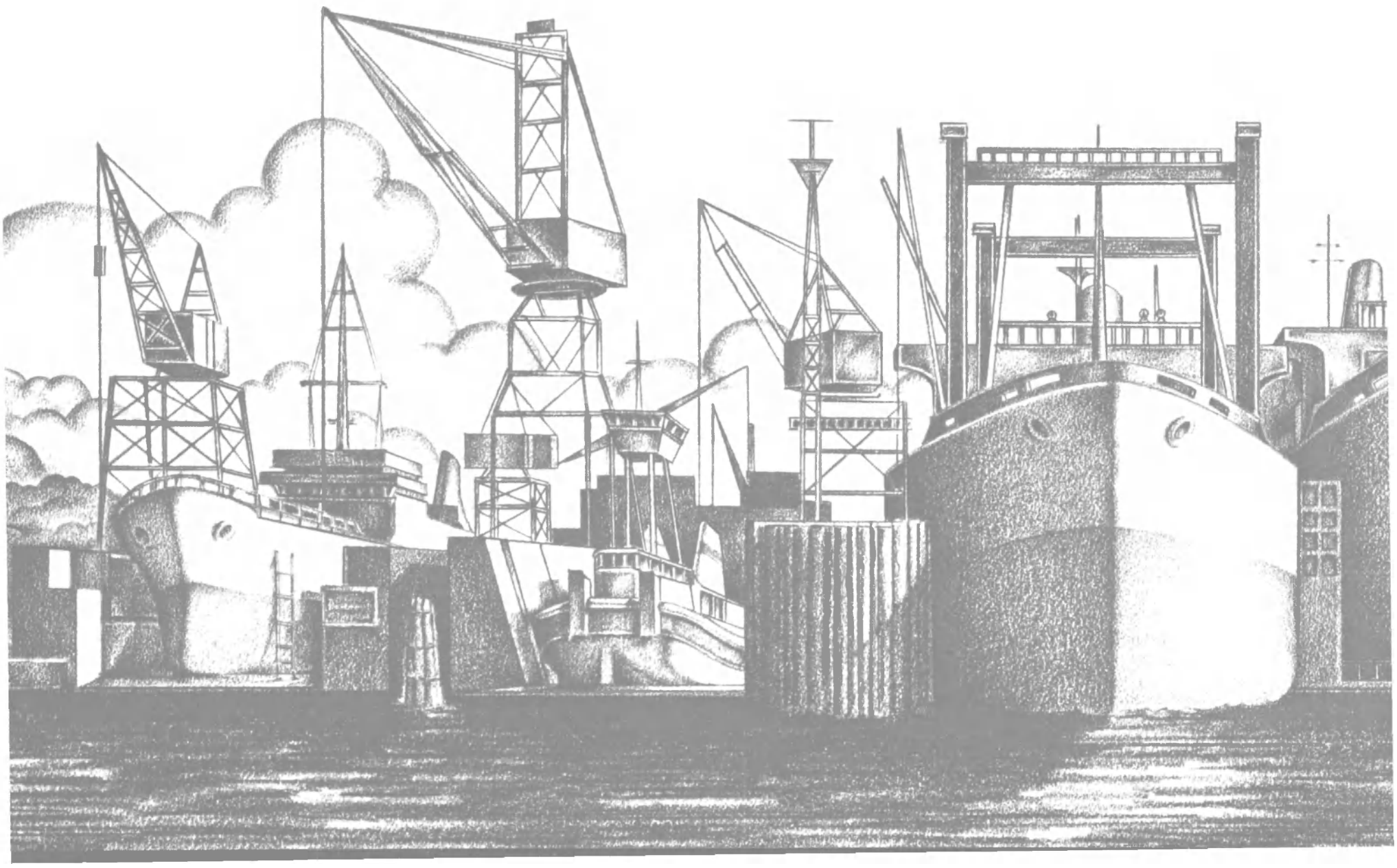
Mr. **Engler** joined El Paso LNG Company as a vice president in 1976, and was named a senior vice president in 1978. Prior to joining El Paso, he had spent 25 years with San Diego Gas and Electric Company, where he initiated San Diego's entry into the LNG business in 1964. His last position with that company was executive vice president.

Send us your ti
Your battered and b
your liners, your VLCC

We're the Portland Ship Repair Yard. And we offer you services and facilities you won't find at any other West Coast port.

First of all, our dry docks can handle any size ship, from tug to VLCC. The Port of Portland's Dry Dock 4 is the largest on the West Coast. It's the only Coast facility that can handle the entire Alaskan crude fleet. In all, we have 4 dry docks—for ships up to 275,000 dwt. No West Coast ship is too big or too small for us.

Second, we don't waste your time. Reserve dry dock time now—select a contractor, negotiate or get two or three competitive bids, even after you're up on blocks. You're assured of superior work because ships are serviced by any one of three nationally renowned companies: Dillingham Ship Repair, Northwest Marine Iron Works, and Willamette Iron and



ed, your broken; arnacled; Your tugs, s yearning to be fixed.

Steel Company. These outstanding companies bring years of experience and unmatched expertise to your service needs—whether they involve repair, maintenance, cleaning, jumbo-izing, ship conversion, or any combination of services.

Contact us about your service needs. Call any of the three contractors listed or the Port of Portland. We think you'll find that our ship repair service is another reason why. . . *we may be your perfect port.*

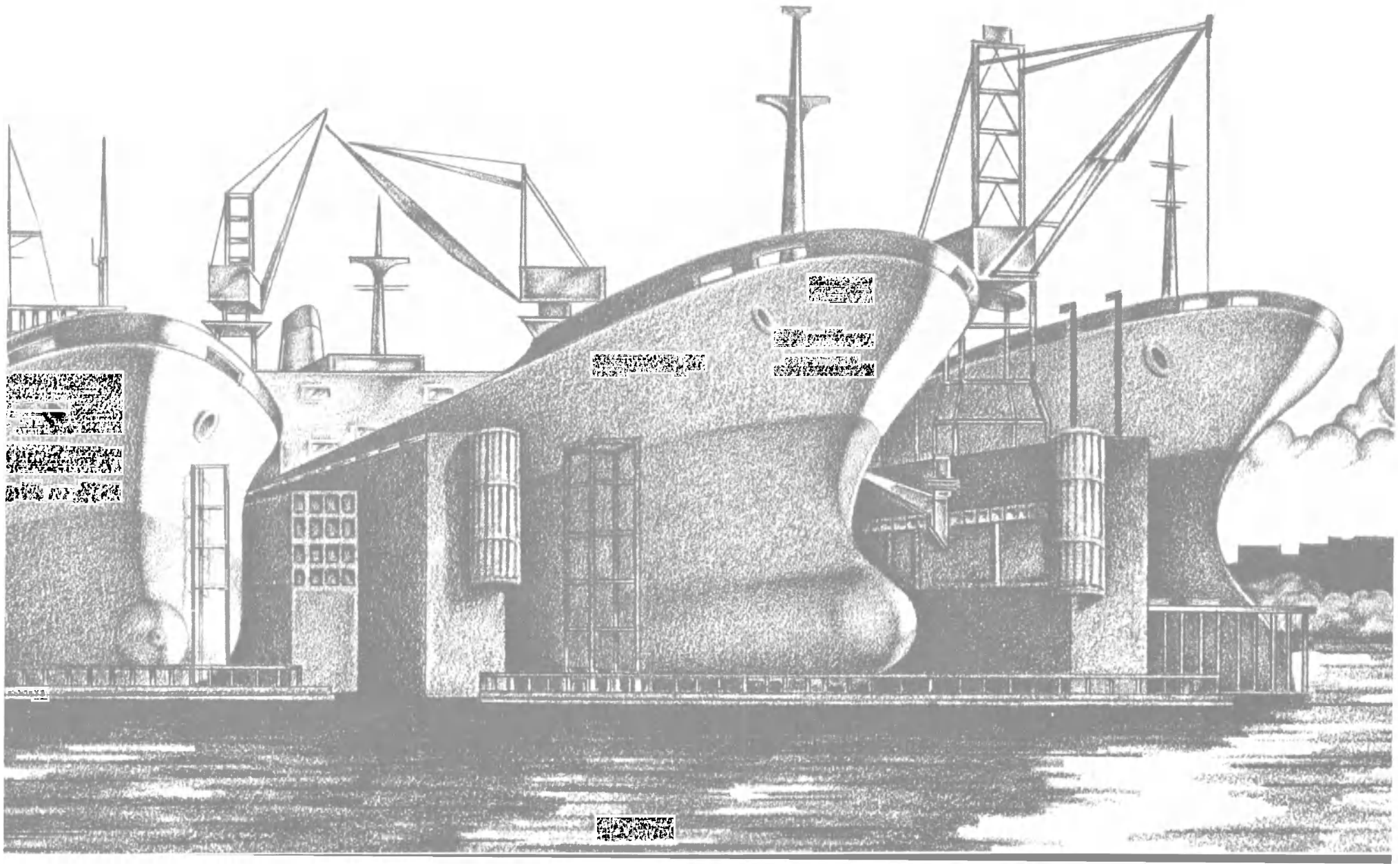
Portland Ship Repair Yard

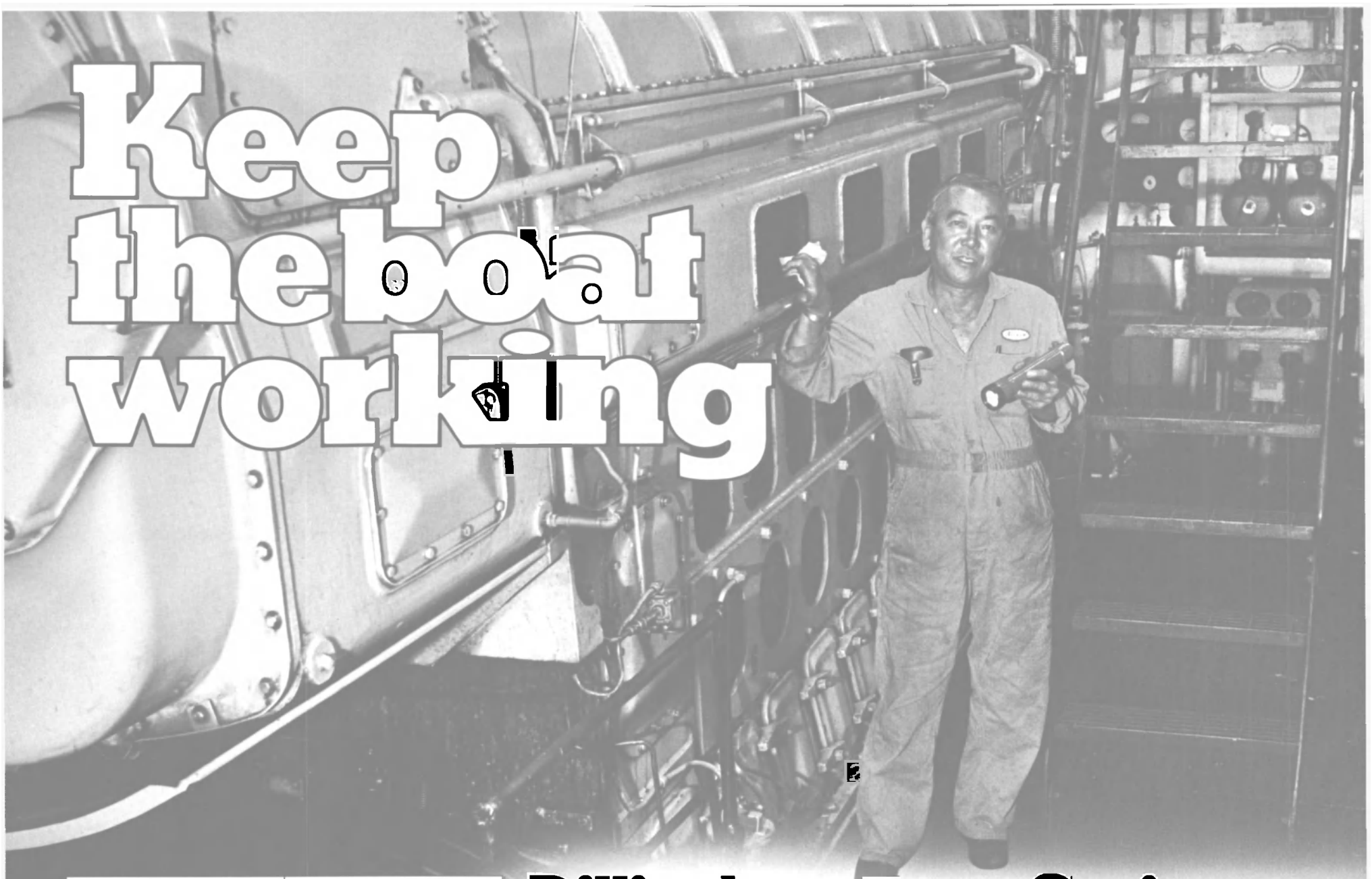
Port of Portland
800 547-8411

Dillingham Ship Repair
503/285-1111

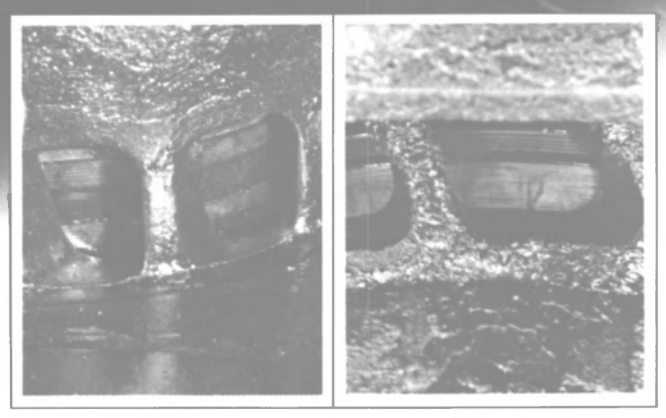
Northwest Marine Iron Works
503/228-8222

Willamette Iron & Steel Company
Days 503/226-5535 Nights 503/226-5200

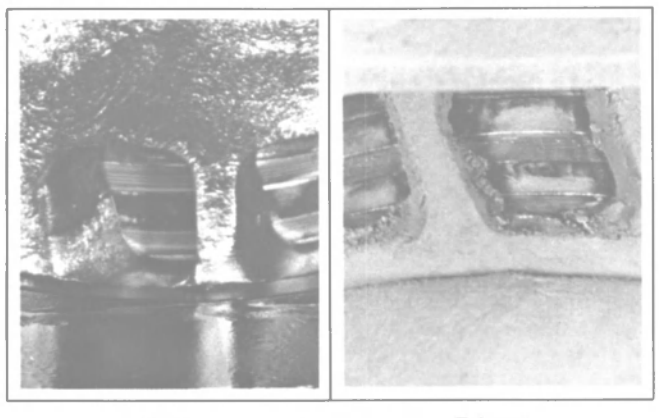




Keep the boat working



Intake 100% open — M.S. Mikioi — Exhaust 90% open



Intake 100% open — M.S. Mikiona — Exhaust 90% open

Dillingham does. Saving over $20,000 a year in each Fairbanks Morse engine with Shell's Caprinus® R Oil.

The "Mikioi", powered with twin Mdl 38D8 - 1/8 6-cylinder engines, and the "Mikiona", powered with twin Mdl 38D8 - 1/8 10-cylinder engines, have logged over 13,600 hours each since their last overhaul. In both boats, *Caprinus** R has been the engine lubricant for more than 3,000 hours — preceded by Shell's *Caprinus* T Oil.

Since Dillingham switched to Shell's *Caprinus* oil the boats have logged over 5,000 hours each without a single day of downtime to clean engine ports.

M. Kent Whitman, Vice President and Manager of Dillingham Tug and Barge Corporation in Hawaii, estimates *downtime costs* for each of Dillingham's ocean-going tugs at *$4,000 per day.* Shunsaku Hirano, Assistant Maintenance Supervisor, estimated that with the engine lube previously used, an HVI base oil, each of the two boats required a three-day downtime period every 1,500 hours (about three times a year) for cleaning of intake and exhaust ports due to excessive power-robbing deposits. *Labor costs* for the cleaning totaled about *$1900 each time* the boats were down.

With the previous oil — each boat averaged 9 days downtime a year, at $4,000 per day, *plus* 3 cleanings a year at $1,900 each — or about $41,700 every year for each boat.

Look at the pictures (left). They show intake and exhaust ports from the engines of the *Mikioi* and the *Mikiona.* Ports are clear. That's because *Caprinus* R with Shell's premium MVI base oil doesn't form hard deposits. It helps keep exhaust port deposits soft and friable. As power output varies, these deposits slough (break) off keeping the ports open and improving air scavenging efficiency.

Whitman stated, "...we looked for an oil that could help us reduce unscheduled downtime and *Caprinus* R has proved it can do it." And, Hirano added, "...with *Caprinus* R there has been a vast improvement over the HVI base oil we did use in keeping the engines clean and ports clear...wear rates are down and the boats run longer between service intervals. *Caprinus* R does the job for us."

Dillingham Tug & Barge has found out what *Caprinus* R can do in Fairbanks Morse engines and in its EMDs too. The high alkalinity, high dispersancy additives, in a premium MVI base oil provide the right combination for the protection the big medium-speed diesels need. Keep them clean, wear rates low and deposits at a minimum.

What could you save with *Caprinus* R Oil? Try it in ALCO, EMD and Fairbanks Morse and *you'll know.* Write us for more information.

Write: Shell Oil Company,
Manager, Commercial
Communications,
One Shell Plaza,
Houston, TX 77002

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

Come to Shell for answers

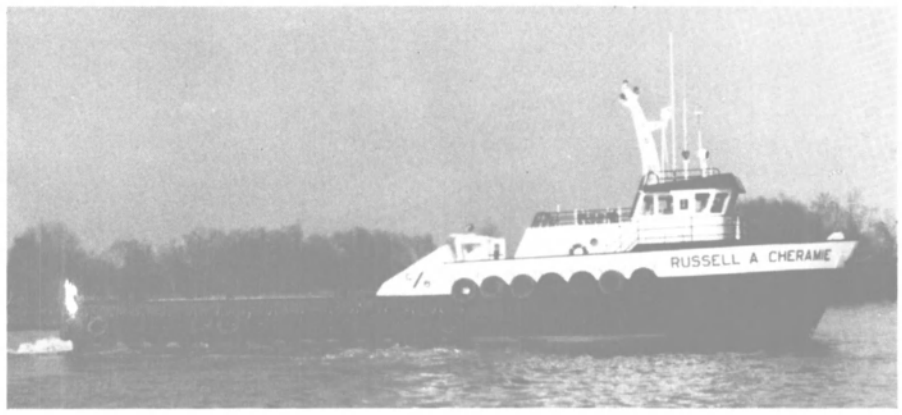
Shell Marine Jobbers provide service, facilities and quality Shell products.

ALABAMA
Bayou La Batre
Deep Sea Marine Products
Location: West Bank, 500 Tram Avenue
Phone: (205) 824-4127
Radio: Ch 16, VHF
Mobile
Midstream Fuel Service, Inc.
Location: Mobile River, Mile 1.5
Address: Fairhope 36532
Phone: (205) 433-4972
Radio: Ch 16, VHF
ARKANSAS
Helena
Helena Fuel & Harbor Service, Inc.
Location: Mississippi Service, Inc. Mississippi River, Mile 661 Riverfront & Bridge Road
Phone: (501) 338-8321
Radio: Ch 16
CALIFORNIA
Oakland
Bay Area Petroleum, Inc.
Location: 421 23rd Ave.
Phone: (415) 534-4517
San Diego
Tuna Clipper Marine
Location: San Diego Harbor Foot of Crosby Street
Phone: (714) 232-1838
San Pedro
San Pedro Marine, Inc.
Location: Berth 74
Phone (213) 832-1339
FLORIDA
Jacksonville
See Savannah Oil & Chemical Savannah, Ga.
Port Everglades
Belcher Oil Company
Location: Port Everglades 2401 Eisenhower Boulevard
Address: Fort Lauderdale
Phone: (305) 525-4261
Tampa
Belcher Oil Company
Location: Tampa Bay
Phone: (813) 247-4572, 247-4573
West Palm Beach
Belcher Oil Company
Location: Port of Palm Beach 1733 Hill Avenue
Phone: (305) 848-1495
GEORGIA
Brunswick
See Savannah Oil & Chemical Savannah, Ga.
Savannah
Belcher Oil Company
Location: Savannah River, Mile 17 Pier 50, Georgia Ports Authority
Phone: (912) 964-8821
Savannah
Savannah Oil & Chemical
Location: Savannah River 647 W. River Street
Phone: (912) 234-5402
ILLINOIS
Hartford
Ory Bros. Marine Service of America, Inc.
Location: Upper Mississippi River, Mile 197 Foot of Hawthorne Street
Phone: (618) 254-0626 (Illinois) (314) 741-2570 (Missouri)
Radio: Ch 16, KLC 791
Wood River
Hartford Fueling Service
Location: Upper Mississippi River, Mile 196
Phone: (618) 254-4333 (314) 741-3667
Radio: Ch 16 VHF KLG 280
KENTUCKY
Louisville
Wooten River Service
Location: Ohio River, Mile 603 2927 River Road
Phone: (502) 896-0317
Paducah
Molloy Marine Service, Inc.
Location: Ohio River, Mile 934 100 Husband
Phone: (502) 443-6456
Paducah
Walker Midstream Fuel and Service Co.
Location: Ohio River, Mile 934 532 South Second St.
Phone: (502) 442-2738
Radio: freq. 156
LOUISIANA
Amelia
Berwick Bay Oil Co., Inc.
Location: Bayou Boeuf Intracoastal Waterway 1/2 mile North 85 mile board
See Berwick listing under Morgan City, La.
Baton Rouge
Capital Marine Supply, Inc.
Location: Lower Mississippi, Mile 230 Foot of North Street
Phone: (504) 343-8379
Radio: Channels 16, 7a, 10, 66a VHF KFT 322.
Baton Rouge
Channel Fueling Service, Inc.
Location: Lower Mississippi, Mile 232 River Road
Phone: (504) 383-4691, 383-4814
Radio: freq. 156.8
Belle Chasse
Plaquemines Oil Sales Corp.
See Plaquemines Oil, Venice, La.
Berwick
Berwick Bay Oil Co., Inc.
Location: Atchafalaya River - 1/4 mile north of Hwy 90 bridge
See Berwick Oil Listing under Morgan City, La.
Cameron
Berwick Bay Oil Co., Inc.
Location: Calcasieu River
See Berwick Bay Oil listing, Morgan City, La.
Cameron
Cameron Marine Service, Inc.
Location: Calcasieu River
Phone: (318) 775-5206
Dulac
Berwick Bay Oil Co., Inc.
Location: Houma Navigation Channel 17 miles South of Houma
See Berwick Bay Oil listing, Morgan City, La.
Gretna
John W. Stone Oil Distributor, Inc.
Location: Lower Mississippi, Mile 96.5 87 First Street, Gretna Harvey 77059
Phone: (504) 366-3401
Radio: KGW 352
Houma
Houma Oil Company, Inc.
Location: Intracoastal Canal
Phone: (504) 872-0464
Intracoastal City
Berwick Bay Oil Co., Inc.
Location: Vermillion River - 1/4 mile north of Intracoastal Canal Mile 155
See Berwick Bay Oil listing, Morgan City, La.
Lake Charles
Channel Fueling Service, Inc.
See Channel Fueling Service, Sulphur, La.
Morgan City
Berwick Bay Oil Company, Inc.
Location: Young's Road
Phone: (504) 384-1610
Radio: Ch 16 VHF-KXR979
New Orleans
Gulf Outlet Fuel & Marine Supplies, Inc.
Location: Gulf Intracoastal Waterways Mile 8 East 3400 Jourdan Road
Phone: (504) 241-8680
Radio: KVF 893
Port Allen
Tri-State Marine Service Co.
Location: Lower Mississippi, Mile 227.5 River Road
Phone: (504) 749-3171
Radio: 156.8
Sulphur
Channel Fueling Service, Inc.
Location: Gulf Intracoastal Waterway West, Intersection of Calcasieu River
Phone: (318) 583-7215, 583-7384
Radio: 156.8
Venice
Plaquemines Oil Sales Corp.
Location: Mississippi River Mile 10.5 at Grand Pass Louisiana Hwy 23, Venice
Address: Belle Chasse
Phone: (504) 394-5555 (Belle Chasse) (504) 534-7403 (Venice)
Radio: WYZ 2375
MASSACHUSETTS
Gloucester
Progressive Oil Co., Inc.
Location: Gloucester
Address: 92 Grove St.
Phone: (617) 283-2000
MINNESOTA
Winona
Waterways - Winona, Inc.
Location: Upper Mississippi, Mile 725 376 East 2nd St.
Address: 455 North St. Fountain City, Wi.
Phone: (608) 687-6931 (Wisconsin) (507) 452-5252 (Minnesota)
Radio: Ch 16-12
MISSISSIPPI
Biloxi
Ship Services Corporation
Location: Gulfport State Port and Biloxi Back Bay, Beacon ;7
Phone: (601) 374-1000
Greenville
Waterways Marine of Greenville, Inc.
Location: Lower Mississippi, Mile 537 Warfield Point Road
Phone: (601) 335-2526
Radio: KWS 617
Pascagoula
Fuel Services, Inc.
Location: Bayou Casotte Ingalls Avenue
Phone: (601) 762-0636, 762-0640
Radio: Ch 16
Vicksburg
Vicksburg Mid-River Services, Inc.
Location: Lower Mississippi, Mile 437 Foot of Lee Street
Phone: (601) 636-4814, 636-7731
Radio: 156.8
MISSOURI
St. Louis
St. Louis Fuel & Supply Co., Inc.
Location: Upper Mississippi, Mile 179
Address: Foot of Gratiot Street
Phone: (314) 421-3960
Radio: Ch 16, VHR-KDO 722 Fort Guage
NORTH CAROLINA
Elizabethtown
Campbell Oil Company, Inc.
Location: 1010 West Broad Street
Phone: (919) 862-4107
OREGON
all ports
see Lilyblad Petroleum listing under Tacoma, Washington
PENNSYLVANIA
Philadelphia
River Associates, Inc.
Location: Delaware River Pier 9 North
Phone: (215) 463-8100
SOUTH CAROLINA
Charleston
Charleston Oil Co.
Location: Ashley and Cooper Rivers, 1553 King St. Extension
Phone: (803) 577-5600
Charleston
See Savannah Oil & Chemical, Savannah, Ga.
Georgetown
See Savannah Oil & Chemical Savannah, Ga.
Port Royal
See Savannah Oil & Chemical Savannah, Ga.
TENNESSEE
Memphis
Memphis Boat Refueling Service, Inc.
Location: Lower Mississippi, Mile 735 Foot of Illinois Street
Phone: (901) 775-3131
Radio: Ch 16
Memphis
Waterways Marine of Memphis, Inc.
Location: Lower Mississippi, Mile 736 Foot of Beale Street
Phone: (901) 525-5761
Radio: Ch 16, 156.6
TEXAS
Corpus Christi
Belcher Co. of Texas, Inc.
Address: 504 Navigation Corpus Christi, Tx. 78403
Phone: (512) 888-6311
Galveston
Grasso Marine Service, Inc.
Location: Galveston Ship Channel Pelican Island
Phone: (713) 744-2888 (dock) (713) 763-4343 (office)
Houston
Houston Marine Services, Inc.
Location: Beacon 126 Houston Ship Channel
Phone: Dock (713) 424-4502 Office (713) 455-8819
Radio: Channel 16
Lake Jackson
Channel Fueling Service, Inc.
Location: Gulf Intracoastal Waterway West, Mile 393 1400 Marlin Avenue
Phone: (713) 233-5321, 233-5322
Radio: 156.8
Port Arthur
Channel Fueling Service, Inc.
Location: Gulf Intracoastal Waterway West, Mile 282 5700 Proctor Street
Phone: (713) 962-5557
Radio: 156.8
Rockport
Berwick Bay Oil Co., Inc.
Location: Rockport Navigation Harbor, Intracoastal Canal, Mile 526
See Berwick Bay Oil Listing, Morgan City, La.
VIRGINIA
Norfolk
Marine Oil Service, Inc.
Location: Elizabeth River
Address: 71 Radar Street
Phone: (804) 622-0934, 622-3109
WASHINGTON
Seattle
Ballard Oil Co.
Location: Lake Washington Ship Canal
Phone: (206) 783-0241
Tacoma
Lilyblad Petroleum, Inc.
Location: Washington and Oregon - all ports
Phone: (206) 572-4402
Radio: KLB radio station Marysville, Wa.
WASHINGTON
all other ports see Lilyblad Petroleum above.
WEST VIRGINIA
Pt. Pleasant
City Ice & Fuel Co.
Location: Ohio River, Mile 265.3
Address: 224 First Street.
Phone: (304) 675-2010

Shell Oil Company
Manager Commercial Communications
One Shell Plaza
Houston, TX. 77002

- ☐ Send me the Shell Shallow Draft Marine Products Guide (SOC: 95-79)
- ☐ Send me the Shell Marine Equipment Lubricants chart (SOC: 122-79)
- ☐ Send me the Shell Marine Jobber Directory (SOC: 127-79)
- ☐ Send me the *Caprinus* R Technical Bulletin (SOC: 17-77)
- ☐ Send me the *Caprinus* R brochure (SOC: 32-77)

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



Versatile supply/utility boat Russell A. Cheramie, built by Halter for C & E Boat Rental, can also serve as survey vessel or diving tender.

Halter Delivers Third 110-Foot Supply Vessel To C & E Boat Rental

Halter Marine, Inc. of New Orleans, La., recently delivered the Russell A. Cheramie, third of four 110-foot supply/utility boats being built for C & E Boat Rental, Inc. of Galliano, La. The new vessel is now working out of Cameron, La., hauling supplies, potable water, and diesel fuel for Continental Oil Company. The multipurpose boat can also operate as a survey vessel or diving tender, and has accommodations for up to 20 people.

The vessel is powered by two General Motors 16V92N diesel engines through Twin Disc MG527 reduction gears with a 3.87:1 ratio. She has a beam of 28 feet, depth of 10 feet, and is under 100 gross tons. Her capacities include 140 tons of deck cargo, 24,000 gallons of fuel oil, 9,000 gallons of potable water, and 40,000 gallons of ballast water.

Officers of C & E Boat Rental include **Robert Eymard**, president; **Mrs. Betty Cheramie,** vice president; and **Ted Cheramie,** secretary-treasurer.

The Russell A. Cheramie was built by Halter Marine's Lockport, La., division, one of 10 yards owned and operated by the company in the Southern U.S.

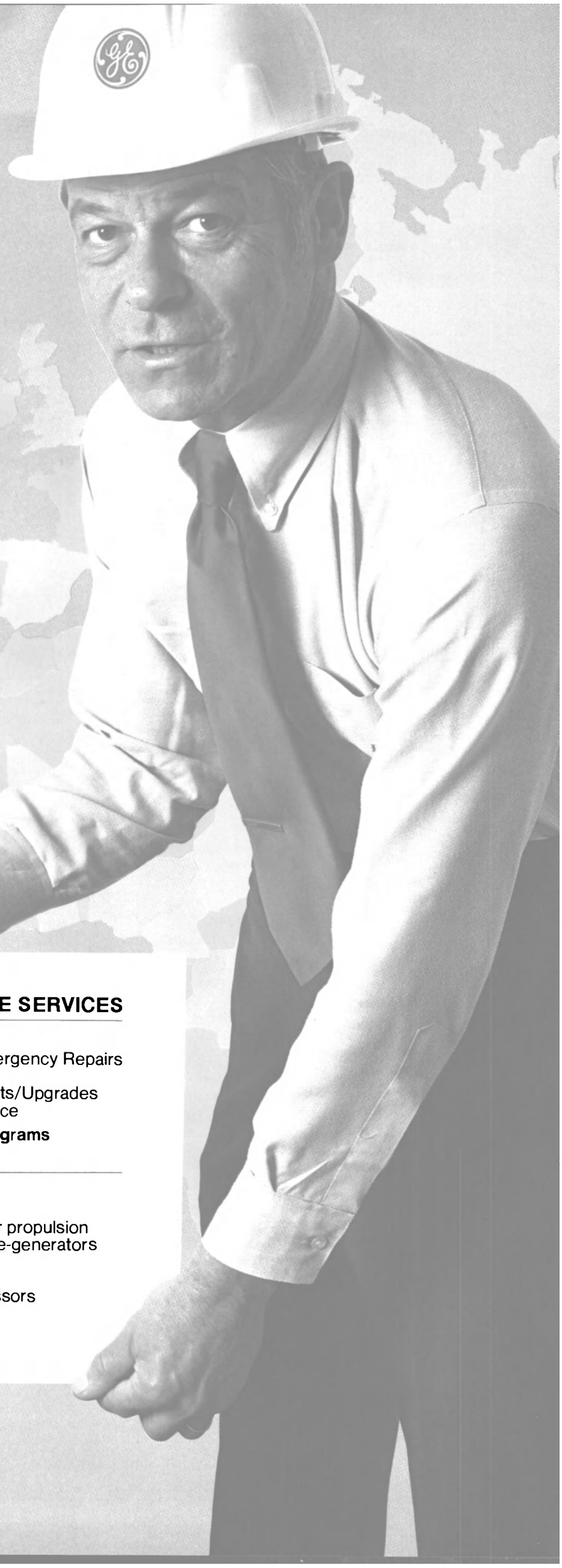
At Amsterdam Dry Dock (ADM) reception in New York (left to right): **J.F.W. Neeb,** managing director, ADM; **William N. Johnston,** chairman, American Bureau of Shipping; **J.J.P. Robertson,** counsel, Consulate General of the Netherlands, New York; **Pierre Dobbelman,** industrial commissioner of the Netherlands, New York; **J.R. Cheshire,** chief representative USA, Lloyd's Register of Shipping; and **Alfred E. Stanford,** president, T.A.S.T. Corporation, U.S. representative for ADM.

Amsterdam Dry Dock Announces Major Modernization Of Facilities

At a recent gathering at the Netherlands Club in New York, **J.F.W. Neeb,** managing director of Amsterdam Dry Dock, and T.A.S.T. Corporation, the U.S. representatives for ADM, hosted members of the marine industry and described the modernization program being carried out in Amsterdam.

Mr. **Neeb** explained the modifications carried out at a cost of approximately $25 million will make ADM one of the most modern in Europe. A model of the facility, including the four floating docks and four graving docks, afforded the attendees the opportunity to observe the physical layout and obtain detailed descriptions of the facilities.

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



General Electric marine field engineers are available 24 hours a day to make quick, competent repairs in any emergency . . . or to perform a wide range of scheduled maintenance services that can help keep navy and merchant ship equipment working at peak efficiency.

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

General Electric Co., Section 950-39A, Schenectady, NY 12345 USA.

GENERAL ELECTRIC'S FULL RANGE OF MARINE SERVICES

SERVICES

Installation
- Shipyard Installation
- Warranty Administration

Maintenance
- Appraisals/Testing & Inspection
- Troubleshooting
- Voyage Repairs/Emergency Repairs
- Surveys/Overhauls
- Modifications/Retrofits/Upgrades
- Complete Maintenance

Technical Training Programs

EQUIPMENT AND SYSTEMS

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

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

SERVICE ANYTIME... ANYWHERE

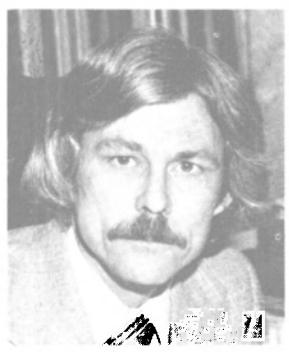
Installation & Service Engineering Division

GENERAL ELECTRIC

Two Executives Named At Mississippi Marine

D. John Nichols, president of Mississippi Marine Corp., Greenville, Miss., has announced the appointment of **R. Monroe Barrett** and **Hugh Smith Jr.** to executive posts in the firm.

R. Monroe Barrett



Hugh Smith Jr.

Mr. **Barrett** recently joined Mississippi Marine as manager of marketing and repair operations, while Mr. **Smith** has assumed the duties of manager of engineering. In his new position, Mr. **Barrett** is responsible for all marketing functions for the firm. He was most recently associated with Brent Towing Company in the dual capacity as chief estimator for all new construction and repair operations, and as general manager of Superior Boat Works.

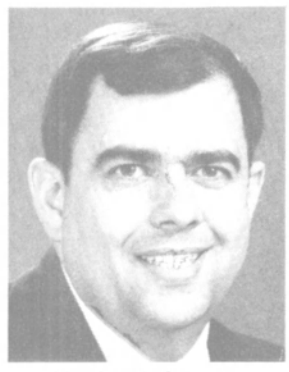
Mr. **Smith,** as manager of engineering, is responsible for all plant engineering, quality control and the research and development of various new vessel designs and fabrication techniques to continually improve the design and quality of all Mississippi Marine projects.

Prior to joining Mississippi Marine, Mr. **Smith** served Marathon Shipbuilding Company at Vicksburg, Miss., as chief engineer.

Tacoma Boatbuilding Appoints Two New Marketing Directors

Tacoma Boatbuilding Company, Inc., a leading Northwest builder of commercial and military ships, has announced the new appointments of **Kenneth L. Kesler** as director of marketing and sales for the Southwest Region, and **Charles A. Garman** as director of marketing for the Northwest Region.

Kenneth L. Kesler



Charles A. Garman

Mr. **Kesler's** activities will focus on Tacoma Boatbuilding's growing involvement with the construction of vessels specifically designed to support the offshore oil industry. He will manage Tacoma Boat's newly opened sales office located at 11[illegible]0 Southwest Freeway, Suite 200, Houston, Texas 77031.

Mr. **Garman** will supervise sales of crabbers, trawlers, and processors which support the fishing industry on the West Coast, from California to Alaska. In addition, he will have marketing responsibility for other commercial vessels, including tugs, barges, and cargo ships.

Mr. **Kesler** has been involved in the construction of offshore equipment for the past five years with Zapata Corporation. Prior to joining Tacoma Boat, Mr. **Garman** was a sales representative for seven years with the Marine and Industrial Division of Goodyear Tire and Rubber Company.

Naikai Zosen Delivers The Pranedya Pratama

The 17,703-dwt product carrier Pranedya Pratama, recently delivered to her owner, Sunhi Scorpa, Inc. of Liberia, was constructed at the Setoda Shipyard of Naikai Zosen, an affiliate of Hitachi Zosen.

Product carrier Pranedya Pratama, first of two to be constructed at the Setoda Shipyard of Naikai Zosen (an affiliate of Hitachi Zosen) for Sunhi Scorpa, Inc. of Liberia, will be used to carry refined petroleum products.

Pranedya Pratama is the first of two product carriers to be constructed at the Setoda Shipyard for use in the transportation of refined petroleum products between Indonesian ports.

The new vessel's tank arrangement conforms to conventional requirements applicable to separate ballast oil tankers for the prevention of ocean pollution. Interior walls of the cargo oil tanks and all the fittings inside the tanks are coated with epoxy resin paint, a paint of the highest quality, to prevent contamination of the product during transportation.

The 10,882-gross-ton vessel has an overall length of 158 meters, beam of 25.8 meters, depth of 10.8 meters and full-load draft of 7 meters (about 518 feet by 85 feet by 35 feet by 23 feet). Propulsion is by a single Hitachi/B&W diesel engine of 6,160 bhp providing a trial speed of about 14 knots.

28TH INGALLS-BUILT DD COMMISSIONED—The USS Ingersoll (DD-990), the 28th ship in the series of Spruance Class destroyers designed and built by Ingalls Shipbuilding division of Litton Industries, officially joined the U.S. Navy in commissioning ceremonies at the shipyard in Pascagoula, Miss., on April 12. This fast, highly maneuverable destroyer, powered by four gas turbine engines, will join the Pacific Fleet and be home-ported in San Diego, Calif.

Designers & Planners Sold—Names Four To Top Management Posts

Feridun K. Serim

Wolfgang Reuter

Designers & Planners, Inc., was purchased recently by Seatech Industries, Inc. from Todd Shipyards Corporation. The new Board of Directors of the firm has named **Feridun K. Serim, Wolfgang Reuter,** and **Monroe Levy** as the new senior controlling officers. Mr. **Serim** becomes president and Mr. **Reuter** executive vice president; Mr. **Levy,** one of the original founders of D&P in 1953, continues on as vice president in charge of the Galveston operations.

John A. Malagraph has been named corporate treasurer, and **William Mancini** was promoted to the position of technical director of New York operations. **Wallace Hogan** continues in the capacity of assistant vice president, and will assist Mr. **Levy** in the operations of the Galveston office.

Both Mr. **Serim** and Mr. **Reuter** will operate out of the D&P office in Arlington, Va.

Prior to joining D&P, Mr. **Serim** held various positions with M. Rosenblatt & Son, Inc., including vice president and technical director; vice president and manager, Basic Ship Design Division; and vice president and manager of the Washington area branch.

Until his recent appointment at D&P, Mr.

John A. Malagraph

Monroe Levy

Reuter served as the director of the Naval Architecture Division of the Naval Sea Systems Command in Washington, D.C. At the Advanced Marine Technical Division of Litton Industries, he worked on the design of the new Pascagoula shipyard in connection with the design of the FDL ship.

Mr. **Malagraph** joined D&P in 1969 as chief accountant. In 1975 he was promoted to assistant treasurer of the firm. Prior to joining D&P, Mr. **Malagraph** was controller and office manager, from 1966 to 1969, for the DeLong Corporation.

Balehi Marine Delivers Two Offshore Crewboats

The E.B.B. Company of Golden Meadow, La., recently took delivery of the crewboats Lady June and Lady Blackie from Balehi Marine, Inc., Lacombe, La. These 86-foot vessels, powered by Detroit Diesel engines, are two in a series of four servicing the Louisiana coast for owners **Eugene Bagala** and **Milton Egle.**

Driving a pair of Doran-Alabama, four-bladed bronze wheels, each hull reached a speed of 12 knots on sea trials, according to naval architect **David P. Levy.**

The Lady Blackie's versatility is extended to firefighting utilizing a pair of Arkon combination fog and straight stream fire monitors. Both boats are equipped with stainless-steel tailshafts and rudder stocks, and with Johnson Cutless stern bearings. Fuel oil capacities are 21,380 gallons aft and 7,650 gallons forward; drilling water capacity is 1,000 gallons.

Pilothouse electronics include a Sitex Model 20 radar, Motorola Model 440 Nautilus

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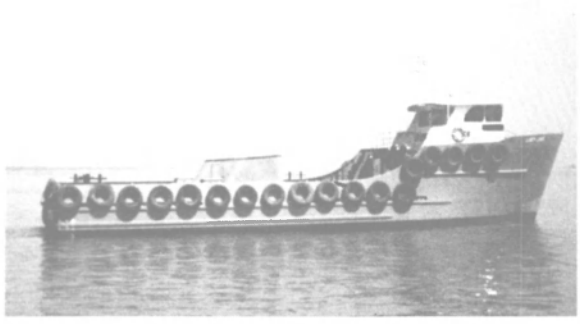

Crewboat Lady June was built by Balehi Marine for E.B.B. Company.

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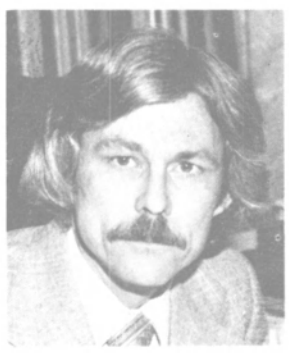

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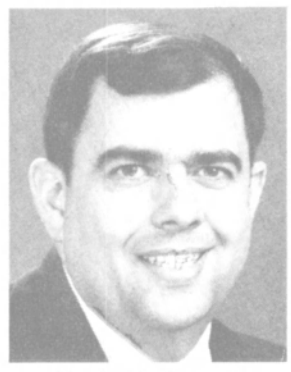

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The new vessel's tank arrangement conforms to conventional requirements applicable to separate ballast oil tankers for the prevention of ocean pollution. Interior walls of the cargo oil tanks and all the fittings inside the tanks are coated with epoxy resin paint, a paint of the highest quality, to prevent contamination of the product during transportation.

The 10,882-gross-ton vessel has an overall length of 158 meters, beam of 25.8 meters, depth of 10.8 meters and full-load draft of 7 meters (about 518 feet by 85 feet by 35 feet by 23 feet). Propulsion is by a single Hitachi/B&W diesel engine of 6,160 bhp providing a trial speed of about 14 knots.

28TH INGALLS-BUILT DD COMMISSIONED—The USS Ingersoll (DD-990), the 28th ship in the series of Spruance Class destroyers designed and built by Ingalls Shipbuilding division of Litton Industries, officially joined the U.S. Navy in commissioning ceremonies at the shipyard in Pascagoula, Miss., on April 12. This fast, highly maneuverable destroyer, powered by four gas turbine engines, will join the Pacific Fleet and be home-ported in San Diego, Calif.

Designers & Planners Sold—Names Four To Top Management Posts

Feridun K. Serim

Wolfgang Reuter

Designers & Planners, Inc., was purchased recently by Seatech Industries, Inc. from Todd Shipyards Corporation. The new Board of Directors of the firm has named **Feridun K. Serim**, **Wolfgang Reuter**, and **Monroe Levy** as the new senior controlling officers. Mr. **Serim** becomes president and Mr. **Reuter** executive vice president; Mr. **Levy**, one of the original founders of D&P in 1953, continues on as vice president in charge of the Galveston operations.

John A. Malagraph has been named corporate treasurer, and **William Mancini** was promoted to the position of technical director of New York operations. **Wallace Hogan** continues in the capacity of assistant vice president, and will assist Mr. **Levy** in the operations of the Galveston office.

Both Mr. **Serim** and Mr. **Reuter** will operate out of the D&P office in Arlington, Va.

Prior to joining D&P, Mr. **Serim** held various positions with M. Rosenblatt & Son, Inc., including vice president and technical director; vice president and manager, Basic Ship Design Division; and vice president and manager of the Washington area branch.

Until his recent appointment at D&P, Mr.

John A. Malagraph

Monroe Levy

Reuter served as the director of the Naval Architecture Division of the Naval Sea Systems Command in Washington, D.C. At the Advanced Marine Technical Division of Litton Industries, he worked on the design of the new Pascagoula shipyard in connection with the design of the FDL ship.

Mr. **Malagraph** joined D&P in 1969 as chief accountant. In 1975 he was promoted to assistant treasurer of the firm. Prior to joining D&P, Mr. **Malagraph** was controller and office manager, from 1966 to 1969, for the DeLong Corporation.

Balehi Marine Delivers Two Offshore Crewboats

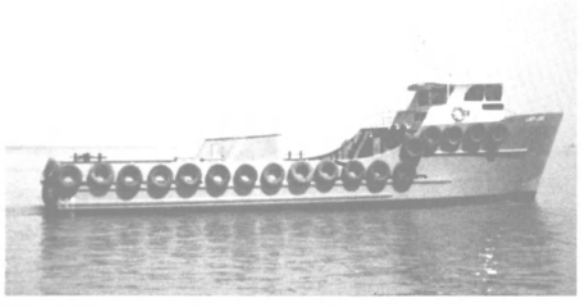
The E.B.B. Company of Golden Meadow, La., recently took delivery of the crewboats Lady June and Lady Blackie from Balehi Marine, Inc., Lacombe, La. These 86-foot vessels, powered by Detroit Diesel engines, are two in a series of four servicing the Louisiana coast for owners **Eugene Bagala** and **Milton Egle**.

Driving a pair of Doran-Alabama, four-bladed bronze wheels, each hull reached a speed of 12 knots on sea trials, according to naval architect **David P. Levy**.

The Lady Blackie's versatility is extended to firefighting utilizing a pair of Arkon combination fog and straight stream fire monitors. Both boats are equipped with stainless-steel tailshafts and rudder stocks, and with Johnson Cutless stern bearings. Fuel oil capacities are 21,380 gallons aft and 7,650 gallons forward; drilling water capacity is 1,000 gallons.

Pilothouse electronics include a Sitex Model 20 radar, Motorola Model 440 Nautilus

Lady Blackie's versatility is extended to firefighting.



Crewboat Lady June was built by Balehi Marine for E.B.B. Company.

VHF radio, and Drake Model TRM-12 SSB radio, all accessible while sitting in a custom-designed swivel armchair.

Woodwork and cabinetry are of teak and mahogany plywood. The teak is finished with teak oil, the mahogany is stained and coated with six coats of marine varnish yielding a yacht-like finish.

The Lady Blackie, on standby for Chevron Oil Company, is captained by **Austusio Mejia**, a 20-year man for E.B.B., and relieved by his son **David Mejia**. Capt. **Noles Bouffanie**, 15 years with E.B.B., pilots the Lady June; he is relieved by Capt. **David Seven**, another 15-year veteran.

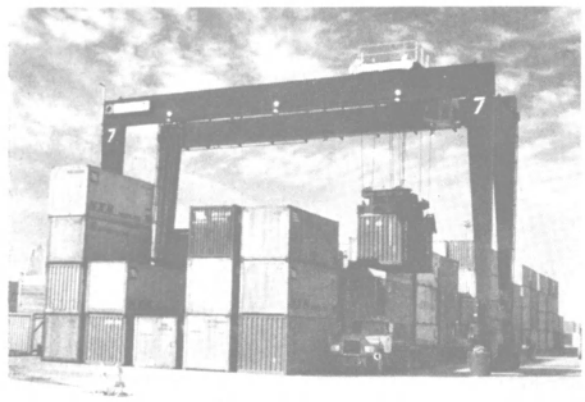
E.B.B. Company's other vessels include crewboats 80-foot Lady Betty, and Lady Joan and Lady May, both 65 feet.

LAUNCHING NEAR FOR FIRST OF SIX BARGES — When completed at Bethlehem Steel Corporation's Sparrows Point, Md., shipyard, this barge will be connected with its tug to form a 691-foot-long oil-carrying unit. It will be the first of six such units contracted to the yard in 1979 for an aggregate price of more than $320 million. The tugs, being built by Halter Marine, Inc. of New Orleans, La., as subcontractor, will be connected at the stern of each barge in a rigid position. Each tug-barge unit will have a beam of 95 feet, depth of 61½ feet, and a deadweight tonnage of about 47,000 at a draft of 40½ feet. They will be classed for unrestricted ocean service. The keel for the barge above was laid in August 1979. Its launching from the building way at the Sparrows Point shipyard will be sometime this summer, with delivery scheduled for fall 1980.

KEEL LAID FOR SELF-UNLOADER—The first keel section of a new 1,000-foot, self-unloading bulk carrier for Oglebay Norton Company was placed in Bay Shipbuilding Corporation's drydock at Sturgeon Bay, Wis., recently. Present at the ceremony were (left to right): **A.J. Zuehlke,** president of Bay Shipbuilding; **John J. Dwver,** president of Oglebay Norton; **Frank A. Castle,** vice president and general manager of Oglebay's Columbia Transportation Division; and Capt. **E.M. Jacobsen,** assistant vice president. Now designated as Hull No. 726, the 60,000-dwt vessel will discharge taconite pellet cargoes at a rate of 10,000 tons per hour via a self-unloading conveyor system. The propulsion plant will be four medium-speed diesel engines providing 14,000 total horsepower and a service speed of more than 15 miles per hour. Delivery is scheduled for May 1981. Oglebay Norton is a Cleveland-based raw materials and water transportation company operating 18 bulkers and self-unloaders on the Great Lakes.

Paceco Cranes Delivered To Matson's L.A. Terminal

Paceco, Inc. of Alameda, Calif., a subsidiary of Fruehauf Corporation, recently delivered one 37-ton Portainer® crane and four 30-ton, rubber-tired Transtainer® cranes to Matson Terminals, Inc., Terminal Island, Los Angeles, Calif.

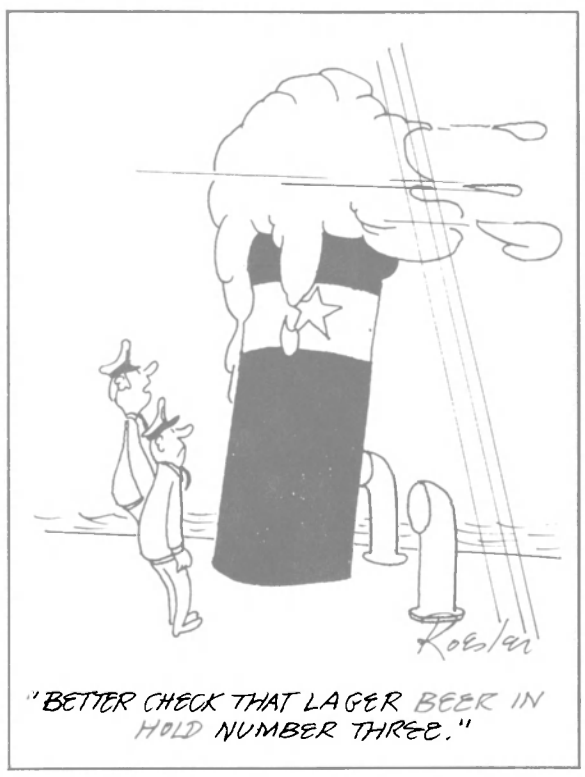


One of four new Transtainer carriers manufactured by Paceco for Matson's Los Angeles terminal. These have 74-foot span.

The new dockside crane and terminal cranes are part of a quantity order placed by Matson to expand service at three of its container terminal operations. The acceptance of these cranes completes the order, making a total of three Portainer cranes (one in Honolulu and one in Richmond, Calif.), and six Transtainer cranes (two in Richmond).

Matson Terminals plans to coordinate use of these cranes in their modern container terminal at Terminal Island, speeding productivity and expanding container throughput. Of the latest design, the Portainer crane has a 110-foot outreach and a 31-foot backreach over the terminal and is a duplicate of the Richmond Portainer. The Transtainer cranes have a 74-foot span with a reeved-in telescopic spreader capable of handling 20 to 40-foot containers. They will stack the boxes four high and five across.

Paceco's Alameda, Calif., and Gulfport, Miss., manufacturing plants coordinated fabrication of the components of the cranes before shipping them to the erection site. Bickerton Iron Works of Torrance, Calif., assembled and tested the new cranes under supervision of Paceco's Field Operations Department.



When you need dependability a single-source Cat Power System pays off.

Whether you're faced with heavy weather or calm, you can depend on Cat *single-source* Marine Power Systems.

Cat propulsion and auxiliary power systems feature totally integrated design with Caterpillar Engines, Transmissions, Generators and Controls. All are built to a single standard of dependable quality.

The total marine power system—all from one manufacturer—simplifies maintenance procedures. And worldwide Caterpillar Dealer parts and service support maintains dependability... for the whole system... wherever you go.

Specify a Caterpillar system... because no matter what the weather, single-source Cat Marine Power pays off.

Ask your local Caterpillar Dealer for more information.
For his name and telephone number, call (800) 447-4700.
In Illinois, call (800) 322-4400.

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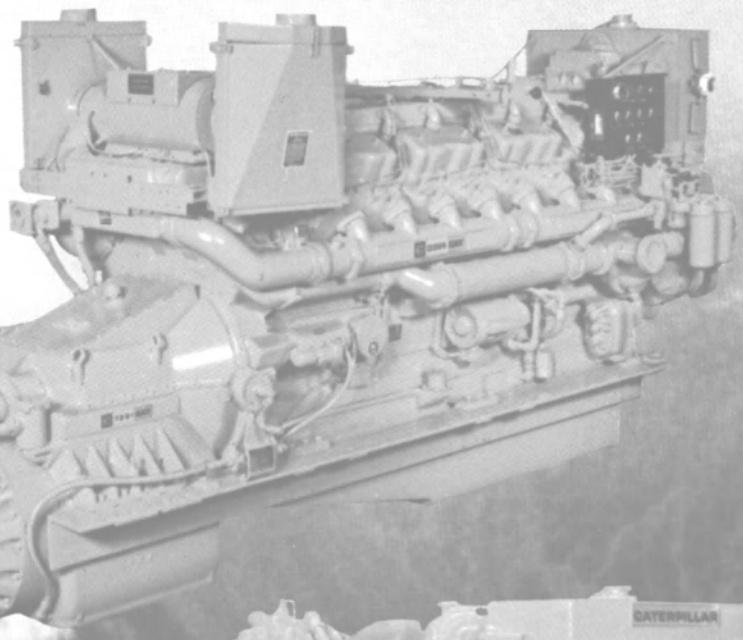
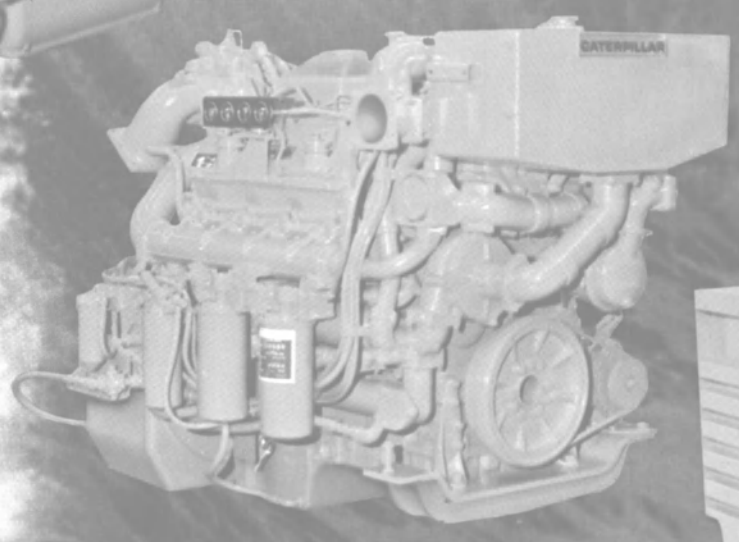
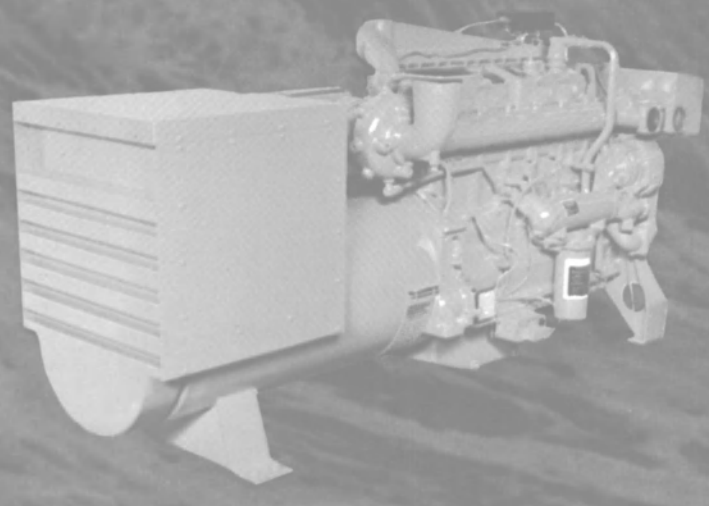






Norshipco To Complete Ocean Barge For CCT

The U.S. Maritime Administration and Seatrain Shipbuilding Corporation have arranged for Norfolk Shipbuilding and Drydock Corporation, Norfolk, Va., to complete the barge portion of an oceangoing tug-barge unit that is scheduled to be placed in service this fall by Coordinated Caribbean Transport, Inc. (CCT), a subsidiary of Transway International Corporation.

Total cost to CCT, payable on delivery, is $11,882,000. CCT plans to place the tug-barge unit in service between Miami, Fla., and Ecuador, operating under the U.S. flag.

Seatrain had been building two of the tug-barge units under construction differential subsidy from MarAd when the shipyard ceased shipbuilding activities in May 1979. By that time, CCT had taken delivery of both tugs from Marinette Marine Corporation, which built them under subcontract from Seatrain.

As part of the arrangement, CCT sold one of the tugs to Seatrain at cost, and was relieved of its obligation to take delivery of the other barge.

The barge being completed by Norshipco will have four cargo decks for roll-on/roll-off service, and be capable of carrying 166 wheeled highway trailers and 120 automobiles.

Grasso Asks Title XI For Six Tank Barges Costing $6.1 Million

Grasso Barge & Transport, Inc. has applied to the Maritime Administration for a Title XI guarantee to aid in financing the construction of six semi-integrated, double-skin tank barges.

Designed to operate on the inland waterways of the United States, the barges will measure 264 feet by 52 feet 6 inches by 12 feet. Estimated total cost of the six barges is $6,156,912, with the Title XI request amounting to $5,387,000.

Jeffboat, Inc. of Jeffersonville, Ind. is the proposed builder. Deliveries are scheduled for 1981, three in March and three in June.

W.A. Marx Appointed Colt Regional Manager

W.A. Marx

W.A. Marx has been appointed Southern regional manager for Fairbanks Morse Engine Division of Colt Industries. Announcement of the appointment was made by **W.T. Hailey**, vice president-sales. **Mr. Marx** succeeds **S.W. Summers**, who is retiring.

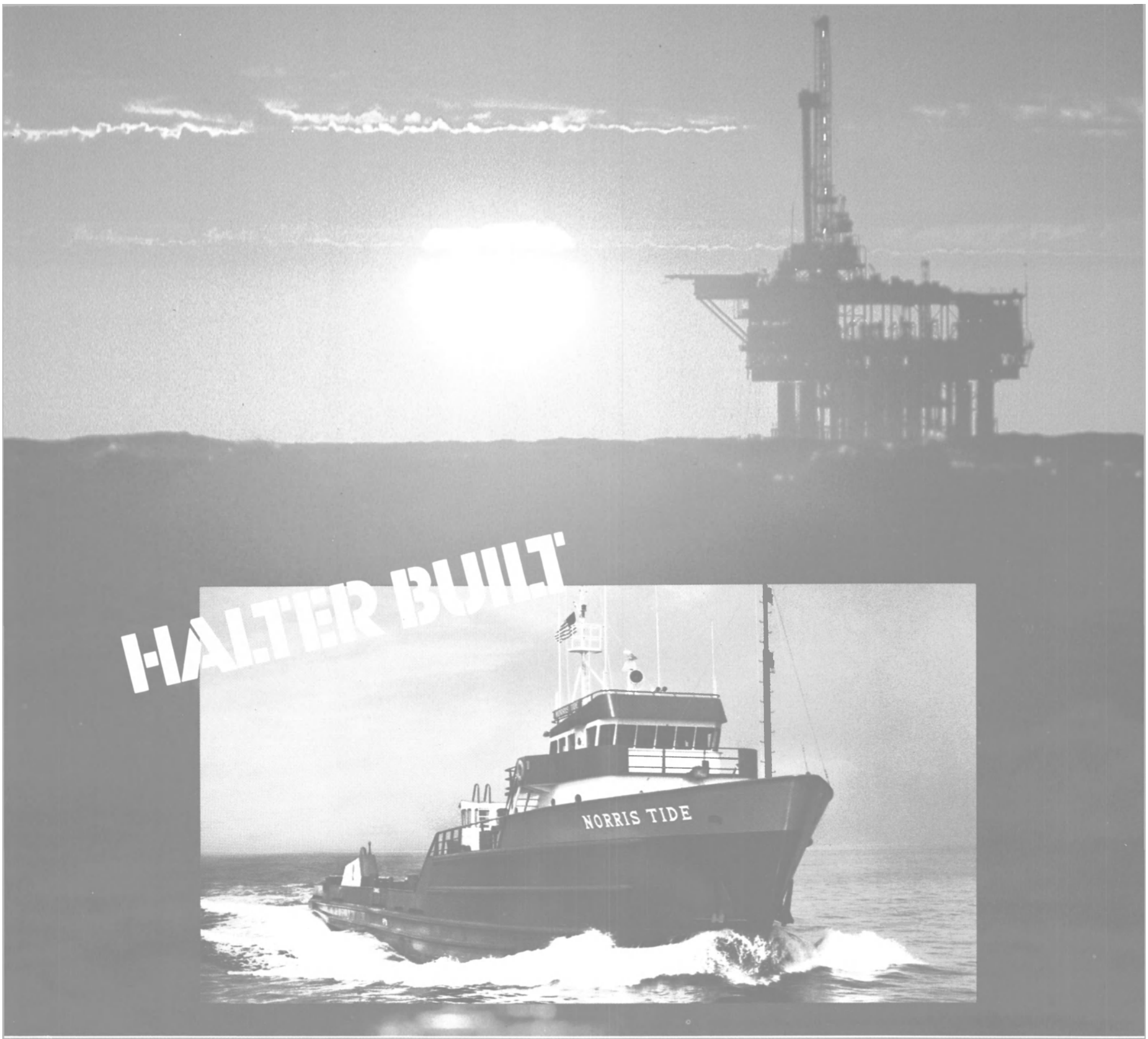
Mr. **Marx** joined Fairbanks Morse in 1946, and has served for the most part in sales management. He will headquarter in the firm's Houston office at 9219 Katy Freeway, Suite 106, Houston, Texas 77024. In addition, he will have responsibility for sales offices in New Orleans, La., and Daytona Beach, Fla.

Literature Available On New Delaval IMO Pumps

A 14-page illustrated bulletin describing the new CIG family of single and double hydraulic pumps is now available from IMO® Pump Division, Transamerica Delaval Inc.

Bulletin CIG-78 contains complete pump selection charts for the 54 single models in the line and for the more than 1,300 combinations available in double-pump configurations. It also includes pressure ratings, drawings, and dimensions.

For a free copy of Bulletin CIG-78, write to **Chris Smith**, Transamerica Delaval Inc., IMO Pump Division, P.O. Box 447, Monroe, N.C. 28110.



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

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

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

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

HALTER MARINE INC.

The Total Shipbuilding Group

Bethlehem's Sparrows Point Yard Gets First Drilling Rig Contract

Houston Offshore International, Inc., has awarded Bethlehem Steel Corporation's shipyard at Sparrows Point, Md., a contract for construction of an offshore oil drilling rig. Announcement of the contract was made by **Jerry E. Chiles**, president of Houston Offshore, and **David H. Klinges**, vice president in charge of shipbuilding, Bethlehem Steel.

This marks the first time that the Sparrows Point yard has received a contract for an offshore drilling rig, although the yard has built several mats (the part of a jackup rig that rests on the ocean floor) that have been incorporated into rigs built at Bethlehem's shipyard in Beaumont, Texas.

The latter yard has long been a leader in constructing equipment for the offshore drilling and production industry. The rig ordered by Houston Offshore is a design developed at the Beaumont yard, which has delivered a number of rigs of such design. This rig is the third ordered by Houston Offshore from Bethlehem; the previous two were built at Beaumont.

Mr. **Klinges** said that he expects the work on the rig will provide about a year's employment for 300 to 400 employees at the Sparrows Point yard. Fabrication is scheduled to begin in May this year, with delivery expected in June 1981.

The unit will have a cantilevered drill floor. This feature permits exploratory or developmental drilling from 15 feet to 45 feet aft of the platform while it is cantilevered over existing wellhead structures. With hook plus setback loads of one million pounds and full-size drilling equipment, the rig will be ideally suited for deep-well drilling in water depths ranging from 11 to 200 feet.

The rig will consist of a buoyant upper platform hull 157 feet long by 132 feet wide supported by a mat foundation 220 feet long by 185 feet wide. Three 11-foot-diameter columns affixed to the mat and passing up through the platform will provide the means for the platform to be jacked above the water to provide sufficient wave clearance.

M.A.N. Diesel Engines Will Power Greek Ships

Two 5,500-dwt freighters—the first of a series—are being built at the Salamis Shipyard in Piraeus, Greece, for Cost Shipping of Athens, and will enter service during the second half of this year. Each ship will be propelled by a reversible 6L 40/45 M.A.N. engine developing 3,300 kw at 600 rpm, driving a fixed-pitch propeller through a reduction gearbox.

These engines are capable of burning 3,500 second Redwood I heavy fuel oil. Options have been taken on another four engines. The auxiliary machinery of these multi-purpose freighters will be driven by diesels built by M.A.N. Nurnberg.

Bulletin Available On Elliott Tube Puller

Bulletin Y-107 titled "Elliott Hydraulic Tube Puller" is available from Elliott Company, Jeannette, Pa., a division of Carrier Corporation.

Designed for pulling ½-inch through 2¼-inch O.D. tubes from condensers and heat transfer units, the tube puller uses hydraulic pressure to free rolled tube joints for quick, easy removal of tubes through their own tube sheet holes. It can be used with manual or power-operated pumps.

The bulletin describes and illustrates the components of the unit, including reservoir, hose, pump, double-acting ram, selector valve, adapter, horseshoe lock, and spear attachments. A seven-step illustration shows the ease of operation of the tube puller, which can be employed in single- or double-end pulling.

For detailed information on the Elliott hydraulic tube puller, request Bulletin Y107-MR from **J.W.D. Wright**, Elliott Company, Jeannette, Pa. 15644.

Mardrill Seeks Title XI For Six Barge Rigs Costing $24 Million

Mardrill, Inc., P.O. Box 654, New Iberia, La., has applied for a Title XI guarantee to aid in financing the construction of six inland drilling and workover barge rigs. According to the applicant, the rigs will operate in the inland waters of Louisiana and Texas.

Par Industries, Inc., New Iberia, La., is the proposed builder, with deliveries to be between September 1, 1980, and July 1, 1981.

Estimated total cost for the six rigs is $24,240,000. If approved, the guarantee would be for $18,180,000, which is 75 percent of the total cost.

$16-Million Overhaul Job For Willamette

Willamette Iron and Steel Company, Portland, Ore., is being awarded a $16,646,300 formally advertised firm fixed-price contract for the regularly scheduled overhaul of the USS Mount Vernon (LSD-39). The Supervisor of Shipbuilding, Conversion and Repair, USN, Seattle, Wash., is the contracting activity. (N62799-70-C-0021)

McAllister Brothers Acquires Independent Towing Of Philadelphia

Shown at the signing in Philadelphia, Pa., **Anthony J. McAllister Jr.** (left), president of McAllister Brothers, Inc., and **William Meyle Jr.** (right), president of Independent Towing Co.

McAllister Brothers, Inc., has acquired Independent Towing Company of Philadelphia, Pa., a major Delaware River tug operator, and will merge it into its organization. The announcement was made by **Anthony J. McAllister Jr.**, president of the New York, N.Y.-based towing and transportation company, which also serves the ports of New York, Baltimore, Norfolk, and San Juan.

The merger adds Independent Towing's fleet of six tugs to the nine McAllister now operates out of the Port of Camden, N.J., doubling the company's service capabilities between Trenton and the Delaware Breakwater.

Independent was founded in 1876 by **Emil Meyle.** He was succeeded successively by his son, **William**, and by **William Jr.**, the present president. **Kenneth Meyle** is vice president. **William Meyle III**, representing the fourth generation of the family, is the corporate secretary.

According to the announcement, Independent Towing will continue its operations as a subsidiary of McAllister. It has berthing facilities at Pier 34 South, Philadelphia, and a total of 50 employees.

McAllister now has more than 110 tugs and barges in its fleet. The company name has been associated with marine transportation in the Port of New York for over 115 years, through four generations of the McAllister family.

New York Section SNAME Meeting Discusses Crude Oil Washing Systems

Newly elected officers and guests at a recent SNAME New York Section meeting included, left to right: **Eric Lithen**, chairman; **W.C. Cowles** of Exxon International, author; **Neil Reddy**, vice chairman; Adm. **Lauren McCready**, honored guest; Prof. **Jose Femenia**, SUNY Maritime College; and **M.S. Hirschkowitz**, U.S. Merchant Marine Academy.

Adm. **Lauren S. McCready**, formerly head of the Engineering Department at the U.S. Merchant Marine Academy, Kings Point, and first head of the National Maritime Research Center, was the guest of honor at a recent meeting of the New York Metropolitan Section of The Society of Naval Architects and Marine Engineers.

The following slate of officers were nominated and elected at the meeting: **Eric E. Lithen**, chairman; **Neil E. Reddy**, vice chairman; **John C. Daidola**, secretary-treasurer; and **Siegfried C. Kellner**, member of the Executive Committee.

The paper presented at the meeting was entitled "A Practical Guide to the Design and Installation of Crude Oil Washing Systems," authored by **Walter C. Cowles** of Exxon International Company, in collaboration with M. Rosenblatt & Son, Inc.

Intended as a guide for modifications to tankers in order to incorporate the latest crude oil washing requirements, the paper described the program developed by Exxon for implementing the IMCO/TSPP 1978 requirements for crude oil washing installations in its fleet of VLCCs and ULCCs. Among the areas covered in the paper were IMCO requirements, performance criteria, design procedures, and numerous examples of design and installation practices.

A lively discussion period followed the presentation.

Literature Available On Butterworth Systems New Oil/Water Separators

Butterworth Systems, manufacturers of oil/water separators, tank cleaning equipment, underwater hull cleaning equipment, and high-pressure water-jetting equipment has announced the addition of two new models — the Butterworth® SFC 0.5 BW and the Butterworth SFC 27 oil/water separators.

Like other models in the company's SFC line (called the SEREP separator when marketed in Contiental Europe), the two new units have been designed to meet the stringent U.S. Coast Guard and IMCO A393(X) regulations. Capacities of these new models are one-half ton per hour and 60 tons per hour, respectively. Both machines are said to provide clean-water discharges containing less than 15 parts per million of oil, and can handle an oil/water mixture up to 100 percent oil.

Additional technical information, and a recently published brochure, "From A to X About Onboard Oil/Water Separators," are available from **Neil Chamberlin,** Butterworth Systems Inc., 224 Park Avenue, Box 352, Florham Park, N.J. 07932.

Hudship Reenters Pushboat Market

Hudson Shipbuilders, Inc. (Hudship) of Pascagoula, Miss., has announced the signing of two new contracts for pushboats to be delivered during 1980.

A contract was signed with **Cliff Spanier** and **Larry Gisclair** of Clydesdale Corporation, Harvey, La., for construction of a 70-foot pushboat. The vessel will be identical to the pushboat Clydesdale, which was delivered in April 1979. Hudship has not constructed a new pushboat since then. However, they have been very active in the offshore and fishing vessel markets, specializing in 112-foot and 120-foot offshore utility vessels.

The company also announced that it will construct a newly designed 85-foot by 30-foot pushboat for **Ralston Cole** of Energy Transport Systems, New Orleans. The vessel will be powered by 8-cylinder General Motors EMD engines, and will have accommodations for eight persons. Energy Transport already has in its fleet the Cindy Cole, a sister vessel to the Clydesdale.

In addition to the Clydesdale, Hudship completed the 70-foot John W. Stone during 1979, which was delivered to owner **John W. Stone** of Oil Distributors, Harvey, La. Hudship plans to continue building pushboats in response to new market demands. They will also continue building offshore workboats and utility vessels.

$9.9-Million Contract Awarded To Ingalls For Destroyer Overhaul

Ingalls Shipbuilding, division of Litton Industries, Pascagoula, Miss., is being awarded a $9,900,000 formally advertised firm fixed price contract for the regularly scheduled overhaul of the USS Forrest Sherman (DD-931). The Supervisor of Shipbuilding, Conversion and Repair, USN, Boston, Mass., is the contracting activity. (N62795-70-C-0001)

Five VPs Appointed By The Offshore Company

The Offshore Company has announced executive changes in two of its wholly owned subsidiaries, Offshore International, S.A. (OISA), and Offshore Venezuela, C.A. (OVCA).

Darryl R. Smith, Aubrey W. Cornelius, A. Hershel Smith, and **G. Austin King** were elected vice presidents of OISA, and **T. Jay Collins** was elected vice president of OVCA.

Darryl Smith serves as division manager in Spain and Mr. **Cornelius** holds the same position in Egypt. **Hershel Smith** and Mr. **King** are division managers in Brazil, and Mr. **Collins** is division manager in Venezuela.

$6 Million Awarded To Westinghouse For R&D

Westinghouse Electric Corporation, Bettis Atomic Power Laboratory, West Mifflin Borough, Pa., has been awarded a $6,000,000 modification to a previously awarded contract for Naval nuclear propulsion research and development. The work will be done at various Westinghouse locations. Contracting activity is the Naval Sea Systems Command. (N00024-79-C-4026)

Record Attendance At INA Annual Meeting

A record number of members attended the Annual General Meeting of the Institute of Naval Architects of British Columbia recently and elected the following board of directors: president, **Les Coward**; vice president, **Dave Moore**; treasurer, **Eric Dixon**; director of education, **Vic Gadsby/ Randy Rigets**; editor of monthly newsletter Metacenter, **Alan Reynolds**; and program and publicity director, **Robert Harris**.

Papers presented during 1979 included, among others: "Collision Avoidance System" by **Kenneth C. Ravenna,** the Western U.S. representative for Sperry Marine Systems; "Design Features and Construction of the M.O.T. Buoy Tender Vessel Dumit" by **T.A. McLaren,** which was built earlier this year by Allied Ship Builders; "An Update of the Impact of Metrification on the Marine Industry and the Naval Architect" by **Eric Dixon;** "New Materials and Methods of Aluminum Construction" by **Sam Matsumoto,** president of Matsumoto Shipyards in North Vancouver; "Three Recently Completed Designs," a short description of three designs recently completed by Cleaver & Walkingshaw, including the 350-foot icebreaker Canmar Kigoriak, a fishing boat and a turret moored drill barge, by **Bruce McDonald;** and "Limiting Factors of Fiberglass Reinforced Plastics for Ship Construction" by **Robert B. Harris.** Onboard inspections of unusual vessels also were made.

Six Appointments Announced For Interlake Steamship

Pickands Mather & Co., Cleveland, Ohio, has announced several major appointments for The Interlake Steamship Company. Pickands Mather, which manages Interlake, is a subsidiary of Moore McCormack Resources,Inc., Stamford, Conn.

Louis H. Mensen has been named superintendent of vessel property. **Robert Dorn** has been named supervisor of marine personnel. **Richard W. Harkins** has been named fleet engineer. **John B. Hopkins** has been appointed assistant manager of ore traffic and vessel dispatch. **James Condon** has been appointed assistant supervisor of marine personnel. **Francis J. Steele** has been appointed manager of vessel operations at Pickands Mather's office in Duluth, Minn.

Mr. **Mensen** previously was fleet engineer in the Marine Department. Before that, he was assistant superintendent of vessel properties. He joined the company in 1952 as second assistant engineer. Formerly assistant to the supervisor of marine personnel, Mr. **Dorn** joined Pickands Mather in 1976. Mr. **Harkins** was formerly marine engineer in the Marine Operating Department, a title he held since joining the company in 1976. Mr. **Hopkins** was formerly operations assistant-marine, a position he has held since joining the company in 1978. Mr. **Condon** previously was operations assistant-marine, the position he had held since joining the company in 1978. Mr. **Steele** most recently was assistant manager of ore traffic and vessel dispatch of the Duluth office.

Raytheon Gets Contract For $4.7 Million For Navy Radar System

Raytheon Company, Wayland, Mass., was awarded a $4,769,967 cost plus incentive fee contract to complete the design, fabrication, and testing of the multiple instrumentation radar system as a result of negotiations. The Naval Regional Contracting Office, Long Beach, Calif., is the contracting activtiy. (N00123-78-C-0248)

TURBO GENERATOR SETS

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

1 

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

G.E. 600 KW GEARED TURBO GENERATORS

2 

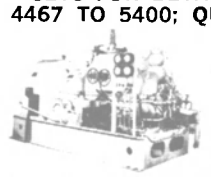
450/3/60/1200 RPM — 961 amps — type ATI — 0.8 PF. TURBINE: FSN-FN-20 6-stage—525 lbs/825°F — superheat 355°/371°F. GEAR: 10033/1200 — RPM 10033 — total—6390 lbs. steam/hr. steam flow.

G.E. 400 KW TURBO GENERATORS

3 

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

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

4 

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

UNUSED WESTINGHOUSE 60 KW 120 VDC M-20-EH

5 

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

UNUSED 500 KW DELAVAL-WESTINGHOUSE GEARED TURBO GENERATOR

6 

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

TURBINES & ROTORS

BETH-SPARROWS POINT, QUINCY HULLS

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

WESTINGHOUSE C-25 CARGO PUMP TURBINE ROTOR

VICTORY-AP2 MAIN PROPULSION

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

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

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

8500 HP G.E. — C-3 OR VICTORY

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

VICTORY SHIP AUXILIARY TURBO GENERATOR SET ROTORS

11 300 KW 5965 RPM JOSHUA HENDY

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

ALSO WESTINGHOUSE 2A & 5A SERIES

– FOR T-2 VESSELS –

12 

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

538 KW WESTINGHOUSE T-2 AUXILIARY GENERATOR — COMPLETE

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

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

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

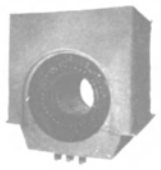
WESTINGHOUSE MAIN PROPULSION STEAM TURBINE WITH ROTOR

15 EX-CHEVRON VESSEL "MACGAREGILL"
Shrouded—like-new condition. Will sell rotor separately.

WESTINGHOUSE MAIN PROPULSION TURBINE

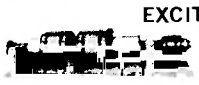
Ex"Pecos" — unshrouded — serial 2A-7733-2 type A

UNUSED G.E. MAIN PROPULSION STATOR

16 

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

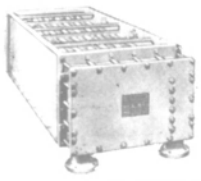
WESTINGHOUSE 538 KW AUX. GENERATOR EXCITER ARMATURE

17 

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

18 **538 KW WESTINGHOUSE AUXILIARY TURBINE ROTORS**

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

19 


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

G.E. 525 KW AUX. GENERATOR EXCITER ARMATURE

20 

75-55 KW

NEW STYLE AMPLIDYNE

21 

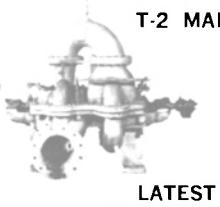
5LY148A2 — type A.M. — frame 605

AUXILIARY GENERATOR ROTORS

22 

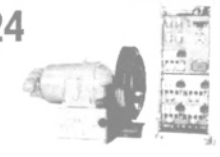
G.E. aux. generator rotors — DORV-325M — for 525 KW turbo generator sets

T-2 MAIN CARGO PUMPS

23 

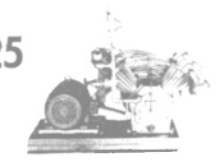
Ingersoll-Rand 6GT — 2-stage — bronze — 2000 GPM — 280' head

LATEST DESIGN 5-SPEED FORCED DRAFT FAN MOTORS

24 

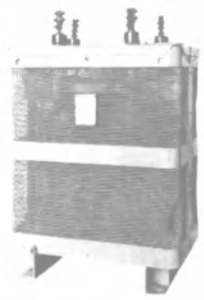
G.E. Model 5M505FE-1 — frame 5055—type M—440/3/60 — serial S.E.6731807. Controller available. (Complete with fan impeller)

T-2 SHIPS SERVICE AIR COMPRESSORS

25 

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

WESTINGHOUSE DRY TYPE T-2 CARGO PUMP TRANSFORMERS

26 

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

G.E. PYRONOL OIL COOLED TRANSFORMERS

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

MISCELLANEOUS DRY-TYPE TRANSFORMERS

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

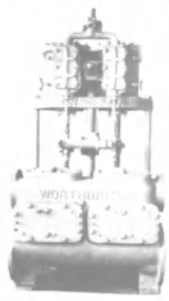
INGERSOLL-RAND 14,000 GPM MAIN CIRCULATOR

29 

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

PUMPS

BRONZE T-2 TANKER STRIPPING PUMPS

30 

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

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

MISSION TANKER T2SEA2 CIRCULATING PUMP MOTOR

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

T-2 MAIN ROTOR

33 

LARGE G.E. MAIN PROPULSION SCHENECTADY TURBINE ROTOR

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

T-2 MISCELLANEOUS, PUMPS ETC.

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

TURBINE FIRE PUMPS — BRONZE

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

NEW BLACKMER FUEL OIL TRANSFER PUMP

36

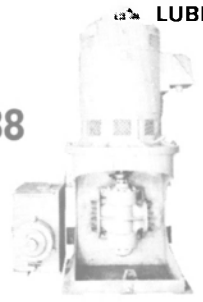
Rotary — 50 GPM — 50 lbs. — 2" — 5 HP — 440/3/60 — with starter & spares

UNUSED BRONZE FEED-WATER BOOSTER PUMPS

37

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

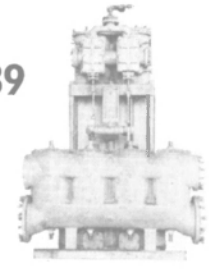
LUBE OIL SERVICE PUMP



38

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

WORTHINGTON 16"x14"x18" VERTICAL DUPLEX STRIPPING PUMP



39

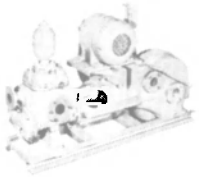
1400 GPM @ 110 PSI; suction lift 11.5 ft. Steam back pressure 15 lbs. Suction 14" — discharge 10" — steam 2½" — exhaust 4". Overall width 6' 8" — overall height 9' 1½" — depth 3' 9½" — approx. wt. 10,000 lbs.

NEW WORTHINGTON VERTICAL SUBMERSIBLE BILGE PUMP

40

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

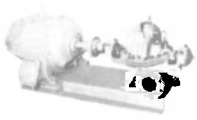
MOTOR-DRIVEN GARDNER-DENVER RECIPROCATING BILGE PUMP



41

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

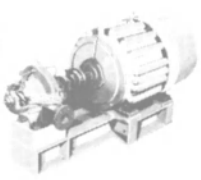
GOULD FIRE AND BILGE PUMP



42

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

AURORA HEAVY DUTY BRONZE FIRE SERVICE PUMP



43

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

DIESEL GENERATOR SETS

410 KW ENTERPRISE DIESEL GENERATOR SET

44

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

AUTOMATIC TENSIONING 12X14 STEAM WINCH

45

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

MISCELLANEOUS

46

16" BRASS PORTLIGHTS

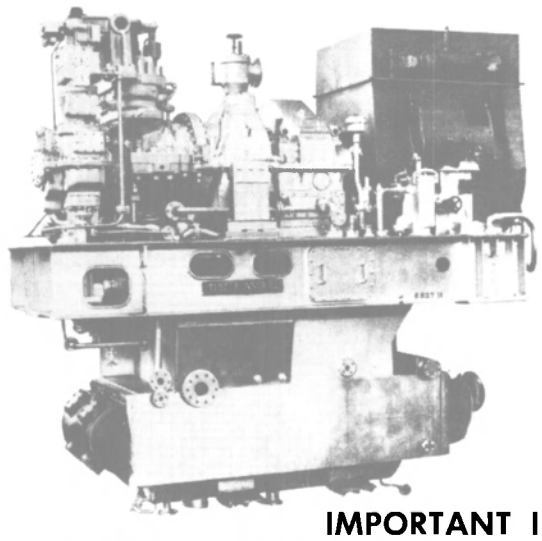
15" and 16" brass portlights. 16" portlights are 3-dog type.

47

IF YOU'RE GOING TO JUMBO-IZE YOU CAN ECONOMIZE WITH THESE

ALLIS-CHALMERS — DELAVAL 1000 KW GEARED MARINE TURBO-GENERATORS

If you are contemplating the new construction of TANKERS, ORE CARRIERS, CONTAINER VESSELS, ETC.



YOU CAN SAVE THOUSANDS OF DOLLARS

with these modern, practically new units — built to highest Navy standards. Send for our free descriptive brochure. You'll be glad you did.... and money ahead!

IMPORTANT INFORMATION

DELAVAL TURBINE: 1442 HP — 10019 RPM — Class GJ-N — 9-stage — 10,000 RPM — 1050 PSI — 950°TT — condensing steam rate 10.30 lbs. Typical serial number 652468. DELAVAL DOUBLE HELICAL GEAR: 10000/1200 RPM—Allis-Chalmers—1000 KW—450 volts—3-phase —60 cycle—1200 RPM—0.8 PF—static excitation—totally enclosed air-to-water cooling—temperature rise: Stator 130°C—Rotor 110°C—class H insulation—typical serial number 160615 —type M.A.K.G. Complete with 525 sq.ft. condenser—190 lbs/hr air ejector—oil coolers—strainer—piping & valves—generator switchgear—static excitation control—voltage regulator. Total weight of unit 40,300 lbs. OAL 12' 9"—OAW 6'. Turbo-generator height 5' 8"—total height of turbo-generator & condenser 12' 8". UNITS IN EQUAL-TO-NEW CONDITION. Originally designed for DLG Guided Missile Frigate Program. Installed only about 2 years, then removed and carefully re-boxed by U.S.N. at Bath Iron Works 1964-65. Navy installed larger units due to increased load requirements.

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Our Marine Department and Warehouse is now located at

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Guided-Missile DDG Christened At Ingalls Shipbuilding Yard

"One of the greatest ironies of today's world is that the United States, which needs both a powerful Navy and a strong and economically viable U.S.-flag merchant marine, has permitted both to languish," U.S. Congressman **Elwood H. Hillis** of Indiana, a member of the House Armed Services Committee, said recently.

Mr. **Hillis**, principal speaker at the christening of the New guided-missile destroyer Scott (DDG-995) at Ingalls Shipbuilding, added that while the U.S. has allowed its fleets to diminish, "the USSR has built its naval and merchant fleets to a size and strength far greater than what is required for Soviet defense and economic needs.

"Events over the last year have graphically driven home the fact that the world is becoming an increasingly dangerous place for the United States," Mr. **Hillis** said. "The challenge to prevent events from tilting the balance of power in the world is not a future concern. The challenge exists today."

The Scott, named for Rear Adm. **Norman Scott**, who died on the bridge of his cruiser division flagship in World War II, is the third of four guided-missile destroyers for the Navy known as the Kidd class. The ships are similar to the 31 jet-powered destroyers of the Spruance class, designed and now being completed by Ingalls.

Mr. **Hillis** said the Scott will help fulfill the Navy's requirement to respond to the increasing Soviet naval air and submarine power. "The Congress authorized the purchase of the four additional DDG-993 class destroyers to improve the Navy's requirement for increased antiaircraft and antisubmarine capability," he said. "These ships will provide a combination of speed, high maneuverability, and will be extremely quiet, and will travel at speeds in excess of 30 knots."

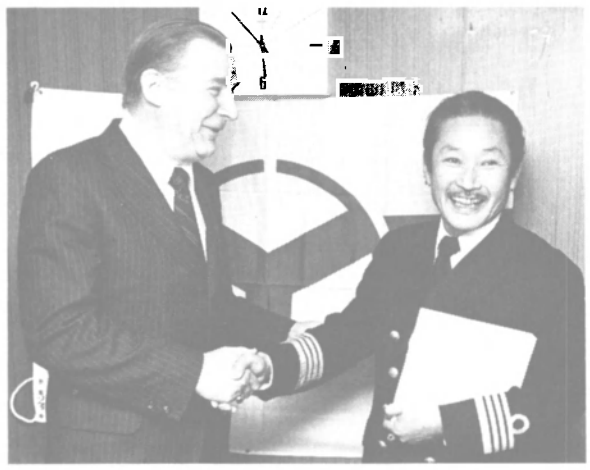
Mrs. Martha Scott Josi smashes champagne bottle across bow of guided missile destroyer Scott (DDG-995), the third of four such ships being built by Ingalls Shipbuilding in Pascagoula, Miss. At right is **Leonard Erb**, senior vice president of Litton Industries and president of Ingalls, and at left is the sponsor's sister, **Miss Pamela Scott**, who served as maid of honor.

Leonard Erb, senior vice president of Litton Industries and president of Ingalls Shipbuilding, told the guests at the christening that "considering what has happened recently in both our economy and our defense posture, it is difficult to imagine a government program that is more productive and directly beneficial to the needs of the country than defense contracting by private industry.

"In the case of Ingalls," Mr. **Erb** said, "going beyond the immediate benefits of national defense and the support of foreign relations, shipbuilding programs mean jobs, and that means jobs for Americans. U.S. Navy combat ships are built in this country, and their equipment is supplied by other manufacturers, both large and small, from throughout the country.

"Practically every dollar that is spent on a shipbuilding program at our shipyard remains in the United States to be turned over and over again," Mr. **Erb** concluded. "That helps our economy. It supports our balance of payments, and it reduces inflation."

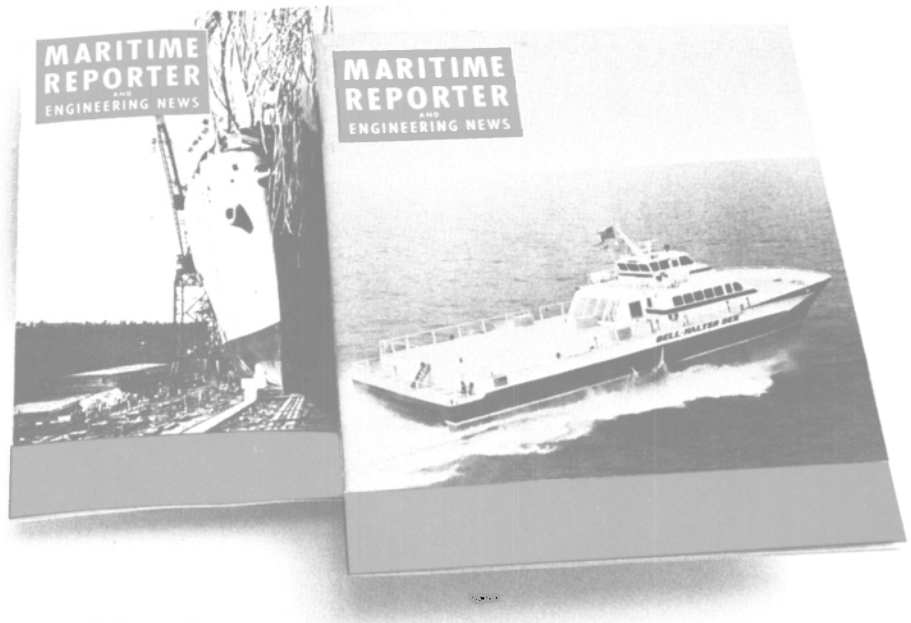
The Scott was christened by **Mrs. Martha Scott Josi** of Salinas, Calif., granddaughter of Admiral **Scott**. Her sister, **Ms. Pamela Scott**, served as maid of honor.



CELEBRATES 50TH CROSSING — "Happy 50" was the greeting and gift presented by **Lloyd R. Graham**, vice president-sales of Moran Towing and Transportation Company, New York, to Capt. **A. Kawasaki** of the full containership Tobhei Maru in recent shipboard ceremonies marking the 50th crossing of the vessel under his command. According to **H. Matsudaira**, North American general manager of Yamashita-Shinnihon Company, Ltd., owners and operators of the 26,760-dwt vessel that has a capacity of 1,728 TEUs, the Tobhei Maru was the first of a group of Japanese ships placed in the Atlantic trade in 1972.

Your only... Number 1 Marine Magazine

TWICE EACH MONTH
THE CURRENT MAGAZINE



Here are the reasons MARITIME REPORTER is NUMBER ONE... the best magazine for your marine advertising... all are powerful, sales building advantages not provided by any other marine publication.

REQUESTED BY THOUSANDS MORE BUYERS WORLDWIDE—
MARITIME REPORTER is requested, in writing, by thousands more marine men who specify and buy than *any* other marine magazine in the entire world.

REQUESTED BY THOUSANDS MORE U.S. BUYERS—
Throughout the entire United States... MARITIME REPORTER is requested by thousands more shoreside buyers than *any* other U.S. magazine.

REQUESTED BY THOUSANDS MORE FOREIGN BUYERS—
Than the second magazine, ME/Log.

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In 1979, MARITIME REPORTER carried more pages of advertising (7 x 10) than No. 2, ME/Log.

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Regular display advertisers in MARITIME REPORTER receive a free listing—company name and address—in the buyers directory section in all 24 issues for one entire year... whether an ad appears in every issue or not. No other marine magazine gives you this continuous sales-building exposure.

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Why pay more...MARITIME REPORTER's advertising rates are lower, cost per buying reader, than any other marine magazine.

TOTAL CIRCULATION OVER 99% REQUESTED...IN WRITING ...BY EACH INDIVIDUAL READER

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Shaft Alignment Was Topic At Philadelphia Section SNAME Meeting

Some 70 members and guests attended the recent meeting of the Philadelphia Section of The Society of Naval Architects and Marine Engineers held at the Engineer's Club in Philadelphia.

Following opening announcements by section chairman **K. Gyswyt,** the nominating committee presented its slate of officers for next season as follows: chairman, **James J. Hibbits,** General Electric Company; vice-chairman, **Thomas P. Campbell,** Sun Ship; secretary-treasurer, **Dean S. Champlin,** Selby Battersby & Company; member of Executive Committee, Mr. **Gyswyt.**

The chairman then turned the meeting over to **Gerald C. Swensson,** meeting coordinator, who introduced **Albert W. Forrest Jr.** of Sun Ship, co-author of the paper titled "Shaft Alignment Using Strain Gages." A detailed description of the strain gage shaft alignment procedure was presented, including a comparison between bearing reactions obtained using strain gages and hydraulic jacking.

The author discussed the various gage configurations available for measuring bending moments, and gave estimates of the resulting error in bending moment. A simplified procedure was presented to calculate bearing reactions for the measured moments. Gage site requirements to produce a determinate system were established, and a method outlined to establish bearing reaction error bounds for a combination of gage configurations and sites.

The interest in this subject was evident by the varied opinions of the discussers, who were: **Frank Graham,** Philadelphia Gear, Inc.; **Bud Thoma,** Transamerica Delaval, Inc.; and **George Laing,** General Electric Company.

Attendees at recent Philadelphia Section SNAME meeting included, left to right: (seated) secretary-treasurer **T.P. Campbell,** Sun Shipbuilding; chairman **K. Gyswyt,** J.J. Henry Co.; author **A.W. Forrest Jr.,** Sun Ship; (standing) discussers **Frank Graham** of Philadelphia Gear, **Bud Thoma** of Transamerica Delaval, and **George Laing** of General Electric; coordinator **G.C. Swensson,** Sun Ship, past chairman; and Executive Committee member **C.W. Lofft Jr.,** Sun Ship.

Three Appointments Announced By R.J. Brown & Associates Firms

V.C. Yin | P.M.D. Fontaine | T.J. Corbishley

V.C. Yin has joined R.J. Brown & Associates of America Inc. as chief engineer, with responsibility for the Engineering Department at the Houston office. Mr. **Yin** has 10 years' experience in offshore engineering with a variety of U.S. companies, including, most recently, Occidental Petroleum Inc., where he was senior construction engineer responsible for new construction engineering aspects of North Sea structural projects.

P.M.D. Fontaine has been appointed vice president and general manager of RJBA Holland BV. He joined RJBA in 1975, and was initially involved in a number of projects in the North Sea and Middle East, before participating in business development activities. He was made executive engineer in 1979.

T.J. Corbishley has been made chief engineer of RJBA Holland BV. He was previously supervisor of RJBA's Structures & Systems Engineering Group, and has 14 years' experience in engineering management and marketing in the U.K. offshore, shipbuilding, and aerospace industries.

R.J. Brown & Associates is an international company headquartered in Switzerland, and with engineering offices in the Netherlands, Houston, Texas, and Singapore.

Two proven long distance lubricating oils. With a unique plus-free!

First is TARO Special—one of the first cylinder oils designed for use in large, slow-speed diesel engines. It helps combat the problems caused by using the fuels available in today's market. Its alkaline additives help prevent corrosive acids being formed, minimizing ring and liner wear.

The second is DORO AR-30—the latest crankcase oil with a low ash additive package and alkaline reserve. It has excellent oxidation and corrosion protection for slow-speed cross-head type diesel engines.

The free ingredient is the 1500 years combined marine experience of members of the Texaco International Marine Sales Group. Texaco International Marine Sales has more Chiefs and Marine Engineers on its staff than any other major oil company in the world. We believe no one can understand your Chief Engineer's problems like another Chief. Our engineers, utilizing the 1500 years experience, are capable of solving most lubrication problems, and through our laboratories, can give prompt oil analysis and interpretation to identify potential problems before they can cause damage to your systems.

Texaco Inc., International Marine Sales Dept., 135 East 42nd Street, N.Y., N.Y. 10017.

Texaco Ltd., International Marine Sales, 199 Knightsbridge, London SW7, 1DE, England.

TEXACO
WORLD WIDE
MARINE FUELS AND LUBRICANTS

Experience you can trust.

Westinghouse Gets $6-Million Contract For Cruiser Gears

Westinghouse Electric Corporation's marine division in Sunnyvale, Calif., has received a $6-million contract to build reduction gears for the Ticonderoga (CG-47), lead ship in a new class of AEGIS-armed guided-missile cruisers.

Under terms of the contract awarded by the designer and builder of the ship, the Ingalls Shipbuilding Division of Litton Industries, Westinghouse will supply two 80-ton reduction gears for the new cruiser. AEGIS cruisers will utilize the hull and propulsion systems developed for the Navy's Spruance class destroyers in combination with the AEGIS combat system.

Herbert J. Cabral, Westinghouse marine division general manager, said the reduction gears will be built to stringent sound-dampening criteria. Each gear will feature specially designed sound isolation mounts that prevent detection by enemy submarines.

Reduction gears are used between the ship's gas turbine and the propeller shaft. They convert the 3,600 rpm input from the gas turbines to 168 rpm required for propeller shaft output.

Delivery of the gears is scheduled for later this year.

$8.9-Million Order To BIW To Overhaul Navy Frigate 'Vreeland'

Bath Iron Works Corporation, Bath, Maine, is being awarded a $8,914,507 formally advertised firm fixed price contract for the regularly scheduled overhaul of the USS Vreeland (FF-1068). The Supervisor of Shipbuilding, Conversion and Repair, USN, Brooklyn, N.Y., is the contracting activity. (N62786-70-C-0001)

NABRICO And Twin City To Build 25 Barges Costing $6.6 Million

I.S. Joseph Barge Co., Inc., 777 Grain Exchange Building, Minneapolis, Minn., has applied for a Title XI guarantee to aid in financing the construction of 25 steel hopper barges. The applicant is a subsidiary of I.S. Joseph Co., Inc. of the same address.

Fifteen of the barges are to be 195 feet by 35 feet by 12 feet, with the remaining 10 to be 200 feet by 35 feet by 12 feet. Nashville (Tenn.) Bridge Co., and Twin City Shipyard, Inc., St. Paul, Minn., are the proposed builders.

The estimated actual cost of the 25 barges, to be operated on the inland waterways, is $6,659,650. The guarantee requested is for 87½ percent of the cost, or $5,-827,000.

Warren T. Myers Joins Whitehall Brokerage

Warren T. Myers has been appointed executive vice president and director of the Whitehall Brokerage, Inc., 17 Battery Place, New York, N.Y. 10004. The Whitehall Brokerage is a wholly owned subsidiary of Ter Bush & Powell, Inc., Schenectady, N.Y., and serves primarily as a marine insurance facility.

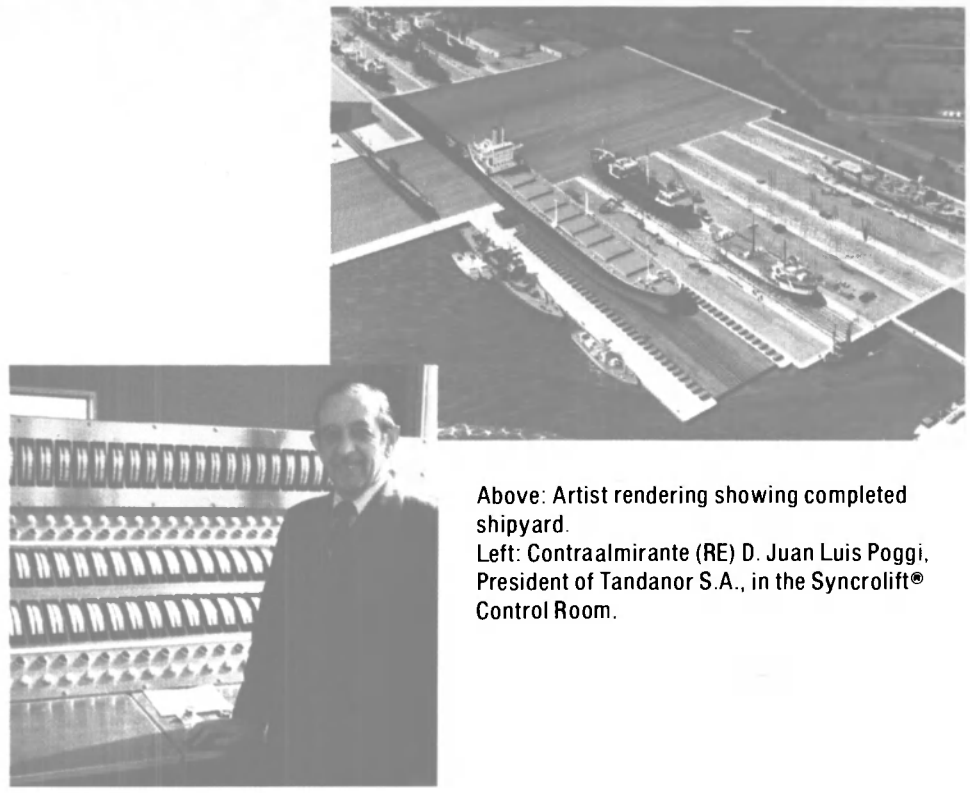
Warren T. Myers

After attending Pace College in New York, Mr. Myers joined the financial division of the Prudential Insurance Company. He was the director of insurance and claims for the last seven years of his 22 years of service with Prudential.

Mr. Myers, a United States veteran with the Corps of Engineers, presently serves on the board of directors for the Association of Water Transportation Officers, as a member of the Association of Average Adjusters, and as a member of the Marine Insurance and Claims Association.

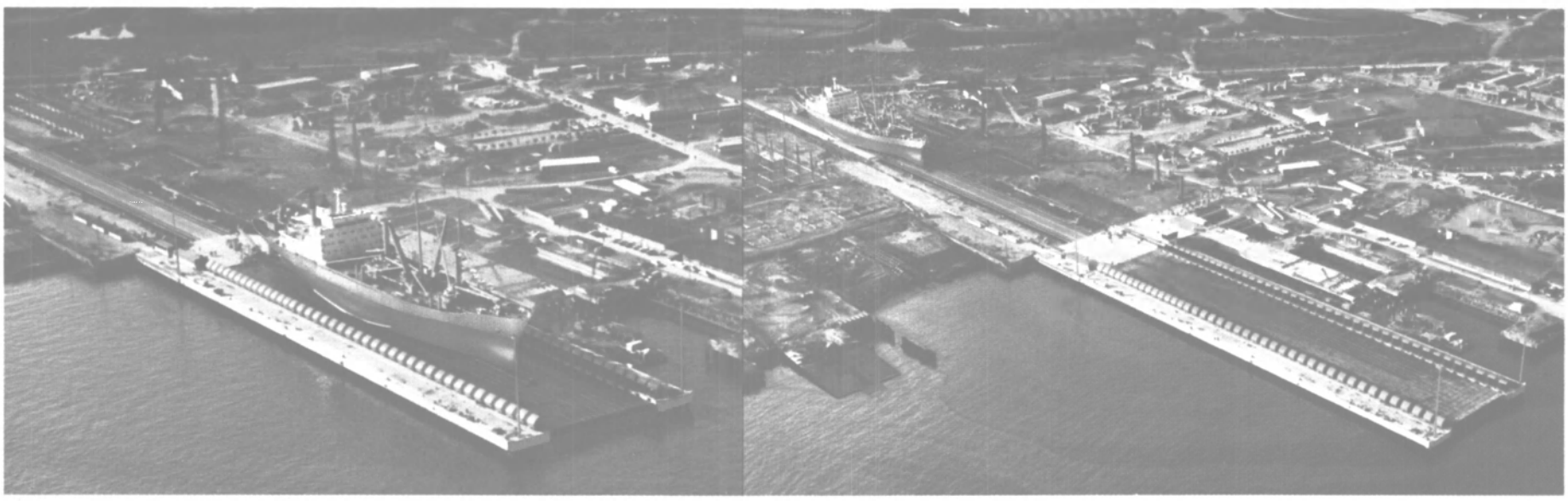
We are proud to announce the inauguration of the

WORLD'S LARGEST SHIPLIFT



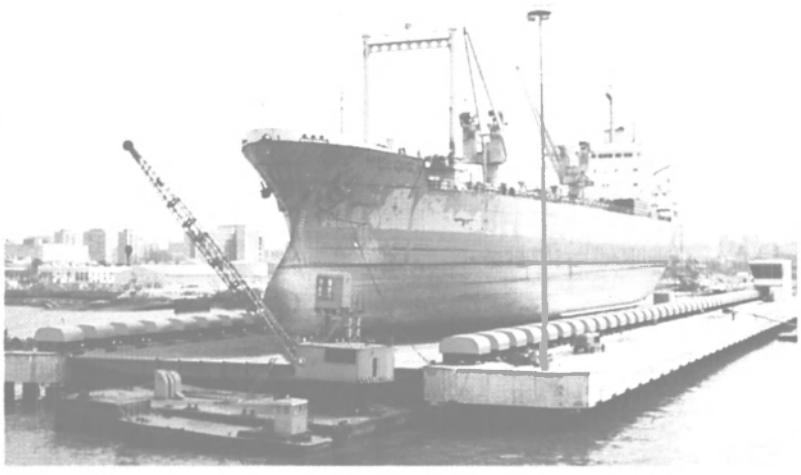
Above: Artist rendering showing completed shipyard.
Left: Contraalmirante (RE) D. Juan Luis Poggi, President of Tandanor S.A., in the Syncrolift® Control Room.

A Syncrolift® 184 meters (604 feet) long, by 32 meters (105 feet) wide, completed only 18 months after contract signing at the shipyard of Tandanor, Buenos Aires, Argentina, for vessels up to 40,000 dead-weight tons.



25,000 DWT vessel on platform awaiting transfer.

Vessel 30 minutes later in extreme rear transfer area.



Water level view of 25,000 DWT vessel on platform.

SYNCROLIFT® UPDATE:

- There are now 138 Syncrolifts® in 57 countries of the world.
- The navies of 26 nations have purchased Syncrolifts®.
- The first Syncrolift® is now in its 22nd year of operation.
- Pearlson Engineering is the only company in the world whose exclusive product is shiplifts.
- Experienced engineers are always available for visits to your site from sales offices in Florida, California, London and Singapore.

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TELEX: 051-9340

A PRODUCT OF **PEARLSON ENGINEERING COMPANY, INC.** A MEMBER OF THE N.E.i. GROUP
The Most Experienced Builder of Shiplift Systems In The World
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Magnavox Offers New Monitoring System —Literature Available

Improved marine safety and economy are being achieved with a new communication tool called the Vessel Monitoring System, according to the system's manufacturer, the Advanced Products Division of Magnavox, Torrance, Calif.

Designed for use with an MX 111 Shipboard Marisat Terminal, the VMS automatically transmits current data from virtually any sensor aboard to any designated telex station in the world at preselected intervals. The ship's home office can thus be provided an automatic running record of the vessel's position, engine room data, cargo, or weather conditions without adding to the duties of ship's personnel.

In operation, the system automatically dials the designated telex number via Marisat satellite at the preselected time, verifies the answer-back, transmits the interfaced sensor's current reading, re-verifies the connections, and then disconnects.

The VMS is expected to be particularly valuable as a watchdog over cargo sensors on LNG and other hazardous cargo carriers, and in emergency situations. From a ship in distress, it can supply position data automatically as frequently as every 16 minutes. Tied into an engine room monitor such as Decca Isis, it can serve as an early warning alert to potential engine trouble.

In addition to its regular transmissions, nonscheduled reports can be initiated at any time by the shipboard operator or by a coded command from the receiving station. The transmission interval can also be changed by either operator.

For a free brochure and further information, contact **Gary Clark**, Magnavox Government and Industrial Electronics Company, Marine Systems Operation, 2829 Maricopa Street, Torrance, Calif. 90503.

Dravo Appoints Peter K. Sour As Vice President

Peter K. Sour

Peter K. Sour has been appointed vice president of sales for Dravo Mechling, the barge line subsidiary of Dravo Corporation, Pittsburgh, Pa. Since joining Dravo in 1975, Mr. **Sour** has served as controller and vice president of finance for Dravo Mechling and Dravo Equipment Company. Prior to Dravo, he was employed by the Nestle Company, Inc. for more than 10 years in assignments both in this country and abroad.

New Diesel Introduced By Cummins Engine— Literature Available

Cummins Engine Company has introduced a new 16-cylinder marine diesel, the KTA-3067-M, that produces 1,250 bhp at 1,800 rpm during continuous-duty operation.

Complete free literature is now available on the new engine, which is the most powerful in the Cummins K series line of engines designed to produce high-power output in a lightweight package with high reliability and durability.

The fuel-efficient KTA-3067-M Cummins marine diesel has a 63 gallon per hour continuous rating.

The compact, V-configuration engine is 120 inches long, 53 inches wide and 76 inches high. It weighs 10,700 pounds with standard accessories, but without gear.

The new marine diesel is turbocharged and aftercooled, and has individual cylinder heads for easier maintenance.

For literature containing complete information and specifications, write **James Thacker,** Cummins Engine Company, Inc., 1000 5th Street, Columbus, Ind. 47201.

Tenvig Offshore A.S Develops Low-Cost Early Oil Production Ship

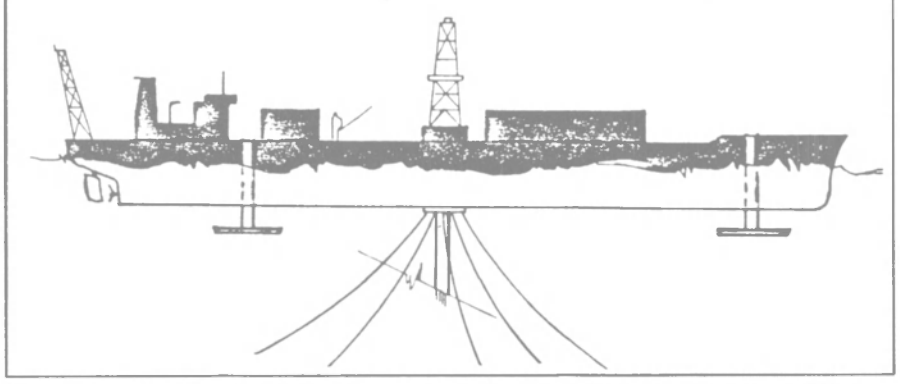

Figure 1 — Converted tanker fitted with unique stabilization system and turret-mooring system provides stable support for drilling, oil processing and storage.

An entirely new concept in offshore oil production facility, called the BTMM Production and Storage Ship, has been designed and developed by Tenvig Offshore A.S (Tenvig) of Oslo, Norway. The fully developed design of the ship and its systems was performed by Tenvig in cooperation with A/S Kongsberg Vapenfabrikk (KV). The latter firm designed the riser and riser-handling systems and Aukra Bruk A.S designed and engineered special parts of the ship's systems.

The project's most outstanding feature, in addition to its storage capability, is the possibility of permitting early on-stream production at a modest investment. The planning and conversion period (ready for tie-in) is estimated to be 20 to 30 months after the decision is made to proceed. Also, the completion time is dependent on the characteristics of the oilfield. Estimates prepared by the designers indicate that such a project has the potential to reduce the general production costs.

The concept involves using a ship, either new or converted, up to the VLCC size as a floating production facility. The main advantages in using such a ship are: large storage capacity, large deck payload capacity, ample deck space for equipment, gas and water injection capacity, easy to maintain and dock if necessary, and low conversion/building costs.

The converted ship, or new, will be fitted with the BTMM Ship Stabilizing System, giving it motion characteristics comparable to a semisubmersible structure — a necessity for using ships as floating production facilities in the North Sea as well as under other conditions. This system and the newly developed BT Turret Production Platform, together with KV's multibore riser system, have made this project possible. The turret-table mooring allows the ship to always choose the optimum heading against the prevailing wave trains.

In designing the ship and its systems, North Sea weather conditions were used as a reference. Tests by the designers and calculations have indicated high regularity and working time.

Whether an existing ship is converted or a new ship is especially designed for this purpose will have a minor effect on the overall technical concept. Converting a modern tanker does not create classification problems, and when converted it will be able to remain on location during the lifetime of the field without docking, provided proper protection, inspection and maintenance are arranged. Preliminary Quality Assurances have been given by classification societies. Should docking be necessary, however, then it is a relatively easy job to disconnect the ship, pull the riser and proceed to a shipyard.

It is considered that the BTMM Production and Storage Ship's main application will be on medium and marginal fields as well as for deep-water fields. The feasibility study and projects executed have been based on a 100,000-dwt tanker—a size which can accommodate a peak production of up to 100,000 barrels of oil per day and will provide a storage capacity of about 500,000 barrels. The design may easily be adapted to a larger tanker if increased capacities are desirable. For this purpose a larger turret production platform for three risers has been considered.

The proposed production systems onboard will be of well-known designs, and will be provided to the client's specifications. All the high-pressure parts of the processing system are located inside the turret production platform. Additional low-pressure processing facilities and storage are on the main deck and in the cargo tanks. The pipeline for transferring oil is connected either to a loading buoy or to a pipeline where this is possible. Off-loading also may take place from a boom at the stern of the ship.

Various safety aspects have been considered in the design. Some of these considerations were: the distance between the living quarters and the hazardous area; location of living quarters in order to reduce heat transference, and a water-sprayed blast and fire wall. An anchor quick-release system combined with the emergency-generator-driven bow-thrusters enable the ship to move away from a danger zone.

Stabilizing System

The BTMM Ship Stabilizing System is the key to this project. The submerged adjustable stabilizing pontoons, Figure 1, fore and aft have the capability of tying up huge oscillating water masses at a level in the sea where the energy is low. Besides, there is a time lag between the wave forces acting on the hull and on the pontoons, resulting in considerable dampening of the ship's motions and accelerations.

This Tenvig system has been thoroughly model tested and highly sophisticated computer programs imperative for the complex calculations and design of the pontoons and their exact positioning were developed in cooperation with Franlab Marine (the French Petroleum Institute). Aukra Bruk A.S participated in the detailed design of the vertical movement and locking system.

Tenvig is presently preparing a full-scale test of the system. The test is expected to be carried out in the North Sea with a 500 to 600-foot vessel.

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The BT Turret Production Platform is octagonal in shape and is placed on top of a central turret table mooring. It comprises two or more decks on which all high-pressure processes are arranged, i.e., first stage separation as well as gas and water injections. Consequently, all transfers between the stationary turret and the rotating ship are arranged via flexible hoses under low pressure.

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(continued on page 40)

Tenvig Offshore's Early Oil Production Ship

(continued from page 39)

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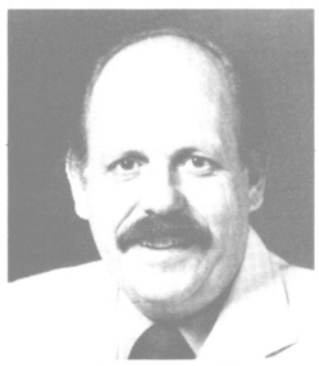

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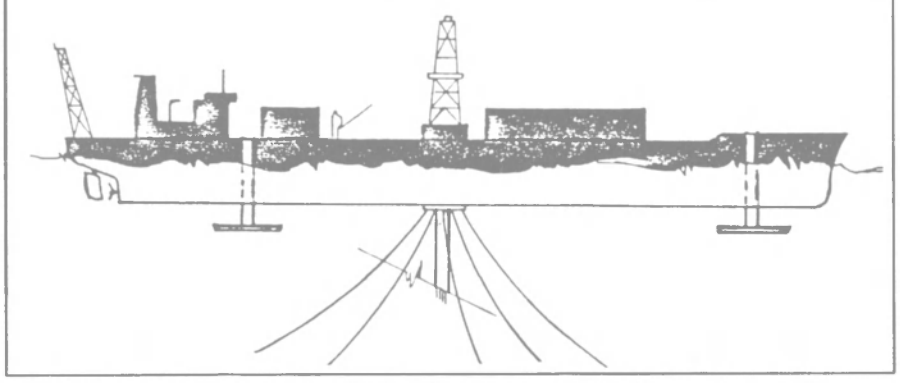

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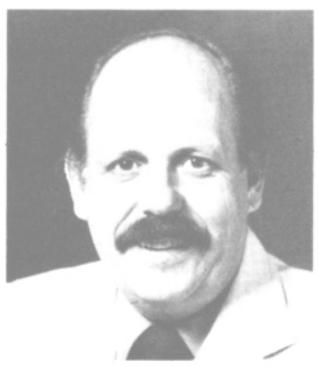

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Central Gulf Seeking Title XI For LASH Barges Costing $7.5 Million

Central Gulf Lines of New Orleans, a subsidiary of International Shipholding Corporation, has applied for a Title XI guarantee from MarAd to aid in financing the construction of 409 LASH barges.

Delivery of the barges, which are to be used in foreign trade between U.S. Gulf and Atlantic ports and the Middle East, Northern Europe, and Southeast Asia, is scheduled to begin in September this year.

The proposed builder is Bergeron Shipyard, Port Bienville, Miss. The Title XI guarantee would cover $6,571,000, or 87½ percent of the total cost of $7,510,647.

Blancke Gets Contract For Fishboat Design

Blancke Marine Services, Inc., Westville, N.J., has obtained a contract from Chico Associates for the preliminary design of a 167-foot freezer / trawler vessel. Primarily designed to catch, freeze, and package various underutilized species of fish located in the North and Central Atlantic Fisheries Management Zone, it also will be capable of acting as a factory/mother ship for smaller fishing boats.

The vessel will have an overall length of 167 feet, beam of 36 feet, depth to main deck of 17 feet, and draft of 16 feet. With a crew of 22 and berthing for an observer and an owner's representative, the trawler will be powered by a medium-speed diesel engine driving a controllable-pitch propeller in a Kort nozzle.

The processing deck is totally enclosed, with sufficient space for automated equipment. Capacity of the blast freezer is 50 tons of fish per day; frozen storage capacity is 300 tons of boxed fish. All fishing gear and winches will be powered hydraulically.

The design for this vessel is expected to be completed by July this year, when it will be offered for competitive bids. Construction is expected to begin in November.

Tracor Will Develop Communications System For Inland Waterways

Tracor, Inc.'s Applied Sciences Group has been contracted, on a consulting basis, to perform the engineering development of an automated Inland Waterways Communications System, which will provide automated voice and data communications services along the Mississippi River and its connecting waterways.

The Austin, Texas, firm will develop the system under a contract from Waterway Communications System, Inc. (WATERCOM), an organization of major towboat and barge operators which, with support from the Maritime Administration of the U.S. Department of Commerce, has developed the operational requirements for an automated maritime radio communications system.

Development of the system meets a recently proposed rule of the Federal Communications Commission, which recognizes the need for this type of communications system network, and is planning new maritime frequency allocations for this purpose.

Dr. **William C. Moyer,** group vice president of Tracor Applied Sciences, said this effort will be performed in the Electronics Systems Division, Arlington, Va. He explained that Tracor will develop hardware specifications, software design, and prototype models for the inland waterways communications project.

"The WATERCOM System should provide every subscriber with voice and data capability identical to that provided by the North American telephone network," Dr. **Moyer** said.

Robert G. Shuster, division vice president of Electronics Systems, has named **James Douglas,** director of Applications Engineering, as program manager for the project. Mr. **Shuster** said the Tracor-designed system will emphasize simplicity in operation, ease of maintenance, and straightforward interconnection with both existing and planned communications equipment.

$24.6-Million Contract Awarded To Sperry For Work On Frigates

The U.S. Naval Sea Systems Command has awarded the Sperry Division of Sperry Corporation a $24.6-million contract to perform combat systems integration for 17 additional FFG-7 Class guided missile frigates now under construction. Prior contracts were awarded for integration of the first 12 systems which are now entering service with the U.S. Navy fleet.

Sperry will integrate and test the combat systems at its Combat System Test Center in Ronkonkoma, N.Y., and then deliver the systems to the shipyards which are building the frigates. The three shipyards are Bath Iron Works in Maine, Todd Pacific Shipyards Corporation, Seattle, Wash., and Todd Shipyards, Los Angeles, Calif.

The combat system Test Center, where the current systems will be integrated and will receive checkout, was originally designed and built by Sperry for the Navy as an engineering aid. The center includes a full-scale operating replica of the FFG-7 Class combat system, including the Combat Information Center (CIC). It was used to verify the initial design of the CIC and to find and correct any problems prior to the construction of the lead ship, the USS Oliver Hazard Perry (FFG-7). Sperry developed a capability to simulate different tactical situations that could exist under varying conditions.

Three New VPs Appointed By Seatrain Pacific Services

Robin Lynch has been named vice president of intermodal operations of Seatrain Pacific Services, the company has announced.

William D. Stevens has been appointed vice president of West Coast operations, and **Michael Cress** operations manager-Southern region with responsibility for the line's Los Angeles port operations. Both Mr. **Lynch** and Mr. **Stevens** will make their headquarters at the division's base at Oakland, Calif.

Gerald W. McCormick Joins Houston Offshore

Gerald W. McCormick has been appointed controller of Houston Offshore International, Inc., Houston, Texas.

Mr. **McCormick** joins Houston Offshore with eight years' experience in all aspects of finance, accounting and administration, having worked most recently at Houston Contracting Company. He is a certified public accountant, with three years' experience as an audit senior with the "Big 8" accounting firm of Arthur Young and Company.

Literature Available On ITT Decca Marine's New Autopilot System

ITT Decca Marine in the past has been the source of only sophisticated autopilots for big ships, fishboats, and navies. Over 13,000 Decca autopilots have been sold to date. The all-new DP150 autopilot is the first small-boat pilot of its caliber to be marketed by ITT Decca.

The DP150 is a compact unit, ruggedly constructed with all solid-state components. Interfacing with existing mechanical or hydraulic steering systems is possible, and complete steering packages can be ordered to suit the requirements of any vessel's steering needs.

The heading reference for the DP150 may be a choice of the small sensing device (sensor) or the remarkably stable Decca MK III transmitting magnetic compass. The MK III compass can be used as a steering or standalone compass. An analog repeater is available for use with both compasses, and up to five repeaters may be installed at one time.

A complete selection of tillers, rudder indicators, switches, rudder translators, junction boxes, hydraulic pumps, and mechanical drive units are also available.

For free literature containing more information, write to **John X. Smith**, ITT Decca Marine, Inc., U.S. Route 1 & St. Joe Road, P.O. Box G, Palm Coast, Fla. 32037.

Nolan R. Gimpel Named Assistant VP At APL

Nolan R. Gimpel has been promoted to the position of assistant vice president at American President Lines, Ltd. (APL), responsible for overseeing the day-to-day management of all APL's North America functions. The announcement was made by **B.I. Henriksen**, vice president, North America.

Most recently managing director of APL's Atlantic Region based in New York City, Mr. **Gimpel** joined the firm in 1978 after some 10 years' experience in steamship and transportation operations in the Pacific and North Atlantic trades. He will be based at APL's North America headquarters at 601 California Street, San Francisco.

New Firm Will Service LOOP Customers

Richard P. (Dick) Guidry, who operates the American Offshore Fleet, recently formed a company, Marine Agents of Galliano Inc., which was set up specifically to provide services to customers of the LOOP terminal scheduled to open this year.

The terminal is expected to handle more than 300 vessels per year in the initial phase, and the new company will offer agency and ancillary services to these ships.

The office is located close to the LOOP storage domes, in the American Offshore Fleet building in Galliano. The address of Marine Agents is P.O. Box 2038, Galliano, La. 70354.

Literature Available On Bloom Cable Winch

Bloom Inc. recently published literature describing the Bloom hydraulic cable winch.

Among the features of the Bloom hydraulic cable winch are a low profile for easy out-of-the-way installation aboard ship or rig; capacities of up to 12,000 pounds, and line speed of up to 75 feet per minute. The winch is equipped with a hydraulic motor directly coupled to ground and hardened wormshaft.

Bloom offers over 100 models of the hydraulic cable winch.

For a free brochure and details, write **Mark Colletti,** Bloom Inc., Dept. M-1, Highway 20, West Four Miles, Independence, Iowa 50644.

Samson Offers Literature On Synthetic Ropes

The latest technology from synthetic fiber research by Samson Ocean Systems, Inc. has resulted in a double-braided rope with the unique combination of high strength and low stretch. The new generation fiber is called Duron II, and is now being used in Samson Stable Braid, an all polyester rope used extensively for utility winch lines, tug headlines, and ship's spring lines.

Stable Braid with Duron II offers highest strength for an all polyester rope, very low stretch over normal working load ranges, improved energy absorption during shock loadings and significantly improved abrasion resistance. This new rope is expected to replace wire in many applications because of these features.

Examples reported are: Stable Braid with Duron II of 3-inch circumference (1-inch diameter) with a tensile of 36,000 and elastic elongation of 2.0 percent at 15 percent load. A 6-inch circumference (2-inch diameter) Duron II rope provides a tensile rate of 118,000 pounds and elastic elongation of 2.4 percent at 20 percent load.

Stable Braid with Duron II is identified by a Samson BlueMark tracer and is now available in sizes from ¼-inch diameter to 21-inch circumference, with tensile ratings from 2,600 pounds to 1,150,000 pounds.

For descriptive literature and prices, contact **G.P. Foster,** Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110.

SNAME '80 Spring Meeting & STAR Symposium

Safety And The Marine Environment

Years of planning will come to fruition with the 1980 SNAME Spring Meeting and STAR Symposium. This has all taken place under a Steering Committee headed by **George Uberti** of National Steel and Shipbuilding, prominent in the Society's San Diego Section, and by a papers committee headed by Rear Adm. **William M. Benkert**, USCG (ret.).

Registration begins on June 3, and papers will be presented June 4-6 at the Hotel del Coronado, Coronado, Calif., minutes from downtown San Diego.

The theme of the symposium is "Safety and The Marine Environment," and there will be 19 papers plus an open forum addressing this concept. This is the fifth STAR meeting of the Society (STAR stands for Ship Technology And Research). These meetings were created to present papers that report current research and development, not necessarily conclusive in themselves.

The meeting will open on June 4 with a plenary session and a general overview entitled "Marine Safety and the Environment—The Challenge of the '80's." The overview, which will be presented by authors **R.D. Leis**, Admiral **Benkert** and Rear Adm. **Randolph W. King**, USN (ret.) will review a summary of a five-year "R.D.T. and E. Plan for Marine Safety," which was sponsored by the U.S. Coast Guard and prepared by the Batelle Memorial Institute.

After the keynote, the meeting will settle down to specific subjects, to include important papers by such well-known authors as **Manley St. Denis, Susan L. Bales, Daniel Hoffman, William Cummins**, and **Haruzo Eda**.

The topics will be as varied as the backgrounds of the above-mentioned authors, with heavy emphasis on maritime safety, much of it from the viewpoint of the U.S. Coast Guard. In dual sessions, for instance, papers on Hull Girder Response, Ship Collision Damage Evaluation, and Hull Strength, which are considerations in modern naval architecture, will be delivered opposite papers on Harbor Navigation Safety, The Impact of Controlled Traffic Lanes and Port Access Routes, the latter three giving the attendee the latest thinking on vessel traffic control. There will be many more such presentations.

At the conclusion of the meeting, all registrants will gather for a final paper by **Richards T. Miller**, SNAME's vice president-technical and research, and an open forum on safety headed by a panel of notable experts in the field.

During the meeting, a full and entertaining social program is planned beginning with a reception on Tuesday evening, June 3, and climaxed by a gala California fiesta on Thursday, June 5.

Technical Papers

Paper No. 1 — "Marine Safety and the Environment — The Challenge of the 80's," **Leis/Benkert/King**.

Synopsis—This opening paper sets the scene and the theme for the 1980 Spring Meeting/STAR Symposium. Included is a summary of the five-year RDT&E Plan for Marine Safety" prepared by Batelle Institute for the U.S. Coast Guard.

CALENDAR OF EVENTS
1980 SPRING MEETING/STAR SYMPOSIUM
HOTEL del CORONADO

Tuesday, June 3, 1980

1:00 p.m.	Registration: Conservatory
5:00 p.m.	Registration closes for the day
5:00 p.m.	Early Bird Reception: Garden Patio

Wednesday, June 4, 1980

7:30 a.m.	Authors/Moderators Briefing: Hanover
8:00 a.m.	Registration continues: Conservatory
8:00 a.m.	Orientation Breakfast: Ballroom
9:15 a.m.	Technical Sessions: Regent Hall
9:30 a.m.	San Diego Tour (including lunch)
12:30 p.m.	Informal Luncheon: Ballroom
1:45 p.m.	Technical Sessions: Oxford/Empress
6:00 p.m.	President's Reception: Garden Patio

Thursday, June 5, 1980

7:30 a.m.	Authors/Moderators Breakfast: Hanover
8:30 a.m.	Registration continues: Conservatory
9:00 a.m.	Optional short tours available
9:00 a.m.	Technical Sessions: Oxford/Empress
11:30 a.m.	Reception: Poolside
12:15 p.m.	President's Luncheon: Ballroom
2:00 p.m.	Technical Sessions: Oxford/Empress
6:30 p.m.	California Festival Prelude: Promenade
8:00 p.m.	California Festival — Dinner, Show and Dancing: Ballroom

Friday, June 6, 1980

9:00 a.m.	Technical Sessions: Regent Hall
11:15 a.m.	Closing General Session: Regent Hall

Paper No. 2 — "Tanker Safety and Pollution Prevention — How Much is Enough?" **Ireland**.

Synopsis — Safety, ecology and economics in tanker design and operation are examined and the interplay of these dependent variables evaluated.

Paper No. 3 — "On the Statistical Description of Seaways of Moderate Severity," **St. Denis**.

Synopsis — The sea and the ship — a current view on the engineering evaluation of survivability with proposals for improvements therein. The statistical representation of nonlinear seaways is discussed and a practical technique for obtaining such a representation is offered.

Paper No. 4 — "Hull Girder Response to Extreme Bending Moments," **Billingsley**.

Synopsis — The inherent deficiencies of traditional section modulus calculations once buckling of elements of the hull girder occurs under extreme loading are discussed. A technique for more accurately determining the effects of individual plate buckling on the integrity of the hull girder is presented, together with the supportive computer program (FLEXSM).

Paper No. 5 — "Evaluation of the Safety of Ship Navigation in Harbors," **Atkins/Bertsche**.

Synopsis — This paper presents a methodology for measuring the safety of navigation in harbor waterways from which can be derived the ability of specific ships to navigate safely in existing or anticipated harbors. Factors considered include ship size and controllability, typical pilot-helmsman performance, channel characteristics and associated aids to navigation as well as environmental conditions (i.e., visibility, wind, current).

Paper No. 6 — "Critical Evaluation of Low-Energy Ship Collision Damage Theories and Design Methodologies," **Giannotti/Van Mater/Jones**.

Synopsis — This paper represents a step forward in the development of reliable methods for designing hull structures to resist low energy collisions. Data sources include model experiments and full-scale information obtained from ship casualty records. The assumptions made by existing theories are assessed, and the collision energy absorption mechanisms are ranked.

Paper No. 7 — "Impact and Feasibility of Controlled Port Approach Traffic Lanes," **Frankel/Johnsen**.

Synopsis — This paper discusses the operational, physical, legal and safety aspects of controlling ship movements in port approach lanes, both inshore and offshore. A risk analysis and operational impact model are included. An evaluation of traffic spacing, lane separation and lane width is presented together with a review of navigational aid requirements.

Paper No. 8 — "Probabilistic Design for Ship Hull Structural Strength," **Daidola/Basar**.

Synopsis — Conventional methods of designing for hull strength make use of accumulated experience, essentially expressed in the form of semiempirical formulae and safety factors. With a new ship type, the resultant lack of "accumulated experience" on vessels of similar size and function makes it prudent to investigate new approaches to longitudinal strength design in an attempt to reduce the uncertainties.

Paper No. 9 — "Coast Guard Development of Port Access Routes," **Bannan**.

Synopsis—The Ports and Waterways Safety Act (1978) directs that the Secretary of Transportation (Coast Guard) shall provide safe access routes for the movement of vessel traffic proceeding to or from ports, and shall designate necessary fairways and traffic separation schemes. The paramount right of navigation is recognized, but reconciliation as practicable with other reasonable uses is urged.

Paper No. 10 — "Safety Challenges in the Fishing Fleet," **Adee**.

Synopsis — The U.S. fishing fleet employs an estimated 120,000 commercial fishermen and is expected to expand further, incident to the 200-mile limit. An industry of this size, confronted by the sea's severe operating environment, faces many safety challenges. Hazards discussed in this paper include fire, impaired stability and personal work-related accidents.

(continued on page 46)

SNAME Spring Meeting & Star Symposium

(continued from page 44)

Paper No. 11—"Control and Guidance . . .", **Hoffman/Armen.**

Synopsis — A fundamental of the seagoing experience is the interplay between environmental excitation (wind and wave), dynamics/response of the affected vessel, resulting loads, and ultimate structural integrity. Recent advances in environmental loading predictive techniques have led to more rational answers to the inherent safety problems. Conventional shipping draws on an experience bank, but assuring adequate safety in the newer, less orthodox floating structures under limiting weather conditions presents a significant challenge.

Paper No. 12—"Life Safety Approach . . .", **Decarteret/Lemley/Sheehan.**

Synopsis — The life safety risks that fishermen face are many and varied, as are the designs of the vessels they operate. This paper presents a series of suggested voluntary practices in the operation, design and construction of fishing vessels that may lessen the risks. Particular emphasis is placed on fire protection, on lifesaving appliances and on certain practices that could prove beneficial.

Paper No. 13 — "Seakeeping in Ship Operations," **Comstock/Bales/Keane.**

Synopsis — Four types of seakeeping intelligence data systems, Optimum Track Ship Routing (OTSR), Tactical Operations Ship Routing (TOSR), Ship Survivability in Extreme Weather (SSEW) and Heavy Weather Operator Guidance (HWOG), can be useful to the operator. This paper focuses on Heavy Weather Operator Guidance whereby quantitative information is provided to the operator on the behavior of his ship under a set of arbitrary sea conditions as well as guidance on avoiding severe motions.

Paper No. 14—"Influence of Hull Form . . .", **Schmitke.**

Synopsis—In this paper, the factors with primary influence on ship rolling are studied parametrically using recently developed and validated prediction methods. Factors include hull form, bilge keel and rudder size, metacentric height, and active stabilization. For each ship configuration, predictions are made for a range of speed and sea conditions. Results are presented in graphical form so that the effect of each parameter on rolling may be readily assessed.

Paper No. 15 — "Extreme Value and Rare Occurrence Wave Statistics . . .", **Cummins/Bales.**

Synopsis — The existing ocean environment data bases, though much improved in recent years, are still inadequate in several respects. Sufficient information for the systematic, scientific design of new ships or the analysis of operational failures is lacking. Consequently, in 1975 the U.S. Navy initiated a project to remedy this deficiency by hindcasting and systematically collating available data collected over a 20-year period. The final product will be a new climatology of wind and waves for the Northern Hemisphere. Some initial results, concentrating on extreme and rare wave occurrences, are presented in this paper. The statistics offer substantially improved capability and are so presented as to facilitate adoption into existing procedures for analyzing performance and structural integrity.

Paper No. 16 — "Proposed Shipboard Maneuvering Data," **Landsburg/Card/Knierim/von Breitenfeld/Eda.**

Synopsis—This paper describes the concepts developed by SNAME Panel H-10 (Controllability) for standardized formats designed to present information on a ship's maneuvering characteristics and capabilities. The information is intended for the practical use of officers and pilots in handling a particular ship. Proposed data acquisition methods will be presented, together with samples of the anticipated end products. The Panel's proposals for standardized maneuvering information are still in draft form, and the authors will welcome comments and criticism thereon.

Paper No. 17 — "Status Report on the Application of Stress . . .", **Chazal/Cojeen/Lindemann/Maclean.**

Synopsis — A number of projects are underway worldwide, aimed at the development of stress and motion monitoring systems designed to assist masters and deck officers in the safe operation of their ships. This paper provides a status report on four such efforts of diverse nature in which the U.S. Coast Guard is participating. Practical aspects of hardware, data presentation and user skill requirements are also addressed.

Paper No. 18—"Nature of Combustion . . .", **Hansen/Baham/Porricelli.**

Synopsis — Existing federal, state and municipal air quality laws are regulations govern emissions from large plants, but there are clear signs that smaller industrial plants will soon be brought under the rules. The lowered limits may well be construed as applying to power plants on ships operating in

ORGANIZATION OF THE TECHNICAL PROGRAM

WEDNESDAY, JUNE 4

REGENT ROOM

9:15 1. **Safety and the Marine Environment** Leis/King/Benkert

10:30 2. **Tanker Safety & Pollution Prevention** Ireland

11:30 3. **Proposed Technique for Describing & Predicting Seaways** St. Denis

12:30 INFORMAL LUNCHEON

	OXFORD ROOM	EMPRESS ROOM
1:45	4. **Hull Girder Response . . .** Billingsley	5. **Navigation in Harbors . . .** Atkins/Bertsche
2:45	6. **Ship Collision Damage . . .** Giannotti et al	7. **Impact of Controlled Traffic Lanes . . .** Frankel
3:45	8. **Hull Strength Design . . .** Daidola/Basar	9. **USCG Development of Access Routes . . .** Bannan

THURSDAY, JUNE 5

9:00	10. **Safety Challenges in Fishing Fleets . . .** Adee	11. **Operations in Heavy Weather . . .** Hoffman/Armen
10:15	12. **Fishing Vessel Design . . .** DeCarteret et al	13. **Seakeeping** Comstock/Bales/Keane

12:15 PRESIDENT'S LUNCHEON

2:00	14. **Rolling in Irregular Seas . . .** Schmitke	15. **Extreme/Rare Waves . . .** Cummins/Bales
3:15	16. **Maneuvering Data . . .** Landsburg et al	17. **Monitoring Motion & Stress . . .** Cojeen et al

FRIDAY, JUNE 6

REGENT ROOM

9:00 18. **Nature of Combustion & Air Emissions from Ships . . .** Hansen/Baham/Porricelli

10:15 19. **The SNAME Technical and Research Program—An Update . . .** Miller

11:15 PANEL DISCUSSION/OPEN FORUM/CLOSURE

coastal waters or in port. New regulations applying to ships are already being promulgated in certain port areas. This paper includes a treatise on shipboard combustion, a survey of port area emission regulations, a comparison of total annual emissions in each of 17 major U.S. ports with the estimated contribution of vessels visiting those ports, an assessment of the need for compliance standards with an estimate of the associated costs, and recommendations for interim local variances to be followed by national regulations for ship emission control.

Paper No. 19 — "Technical and Research Program . . .", **Miller.**

Special Activities

Early Bird Reception, Garden Patio, 5:00-8:00 p.m., Tuesday, June 3. For those early arrivals who wish to meet old friends and make new ones, a no-host cocktail party will take place.

San Diego Tour, 9:30 a.m.-3:00 p.m., Wednesday, June 4. An interesting tour of the Plaza of Old San Diego, including a visit to the fine selection of shops in the Bazaar del Mundo, followed by lunch at a famous San Diego restaurant. The afternoon will include a drive along the city's exciting waterfront, and a spectacular view of the Pacific Ocean from historic Point Loma Lighthouse.

Informal Luncheon, Ballroom, 12:30 p.m.-1:30 p.m., Wednesday, June 4. Convenient and informal buffet luncheon in the hotel for members, spouses, and guests.

President's Reception, Garden Patio, 6:00 p.m.-8:00 p.m., Wednesday, June 4. Society president **Lester Rosenblatt** will be host to all registrants and their guests at this traditional event in a Mexican fiesta setting. Complimentary refreshments will be served.

President's Luncheon, Ballroom, 12:15 p.m.-1:30 p.m., Thursday, June 5. A general reception will be held poolside prior to this traditional luncheon. Cash bar service will be available. Society president **Lester Rosenblatt** will officiate. Featured will be the presentation of the new Spring Meeting Paper Award, and an address by Mr. **Rosenblatt.**

California Festival, 6:30 p.m.-1:00 a.m., Thursday, June 5. A gala fiesta commencing with cocktails on the Promenade Deck of the hotel, followed by dinner, entertainment, and dancing in the ballroom. The relaxed, friendly, informal atmosphere so indigenous to southern California and neighboring Mexico will prevail throughout the evening. Dress is informal.

New York City's Big Apple Goes To Sea

New York City's economic development commissioner **Kenneth Schulman** (on the left) is shown accepting a special Big Apple award for Mayor **E. Koch** from **James A. Thompsen,** vice president of marketing for Jackson Engineering Company.

The Big Apple, symbol of New York City's economic and entertainment life, was utilized by Jackson Engineering Shipyard recently in a most unusual ceremony. The company designed a flag with the New York City red apple symbol on a field of white. While hundreds of invited guests and shipyard employees looked on, New York City's economic development commissioner **Kenneth S. Schulman** gave the signal that sent the first Big Apple flag up the mast of the USS Waterford (ARD-5). At the same time, flags were raised on the USNS Comet, other vessels in the yard, and a New York City fireboat that presented an impressive water display. The opening and closing flag ceremonies were performed by the color guard from Kings Point Merchant Marine Academy.

In addition to the flag, an appropriate engraved Big Apple Citation was presented to the commanding officers of each vessel. A personal citation was also awarded Mayor **Koch,** honoring him for his continuing efforts on behalf of the maritime industry of the Port of New York.

City councilman **Nicholas LaPorte** praised the shipyard for its ongoing expansion program. Other guest speakers included **L.J. Bettencourt,** first selectman, City of Waterford, Conn.; **Paul Proske,** president, Staten Island Chamber of Commerce; and **John Fanelli,** vice president, New York City Convention Bureau. In addition, representatives from the U.S. Navy, U.S. Coast Guard, Military Sealift Command, and various city agencies attended the affair.

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coastal waters or in port. New regulations applying to ships are already being promulgated in certain port areas. This paper includes a treatise on shipboard combustion, a survey of port area emission regulations, a comparison of total annual emissions in each of 17 major U.S. ports with the estimated contribution of vessels visiting those ports, an assessment of the need for compliance standards with an estimate of the associated costs, and recommendations for interim local variances to be followed by national regulations for ship emission control.

Paper No. 19 — "Technical and Research Program . . .", **Miller.**

Special Activities

Early Bird Reception, Garden Patio, 5:00-8:00 p.m., Tuesday, June 3. For those early arrivals who wish to meet old friends and make new ones, a no-host cocktail party will take place.

San Diego Tour, 9:30 a.m.-3:00 p.m., Wednesday, June 4. An interesting tour of the Plaza of Old San Diego, including a visit to the fine selection of shops in the Bazaar del Mundo, followed by lunch at a famous San Diego restaurant. The afternoon will include a drive along the city's exciting waterfront, and a spectacular view of the Pacific Ocean from historic Point Loma Lighthouse.

Informal Luncheon, Ballroom, 12:30 p.m.-1:30 p.m., Wednesday, June 4. Convenient and informal buffet luncheon in the hotel for members, spouses, and guests.

President's Reception, Garden Patio, 6:00 p.m.-8:00 p.m., Wednesday, June 4. Society president **Lester Rosenblatt** will be host to all registrants and their guests at this traditional event in a Mexican fiesta setting. Complimentary refreshments will be served.

President's Luncheon, Ballroom, 12:15 p.m.-1:30 p.m., Thursday, June 5. A general reception will be held poolside prior to this traditional luncheon. Cash bar service will be available. Society president **Lester Rosenblatt** will officiate. Featured will be the presentation of the new Spring Meeting Paper Award, and an address by Mr. **Rosenblatt.**

California Festival, 6:30 p.m.-1:00 a.m., Thursday, June 5. A gala fiesta commencing with cocktails on the Promenade Deck of the hotel, followed by dinner, entertainment, and dancing in the ballroom. The relaxed, friendly, informal atmosphere so indigenous to southern California and neighboring Mexico will prevail throughout the evening. Dress is informal.

New York City's Big Apple Goes To Sea

New York City's economic development commissioner **Kenneth Schulman** (on the left) is shown accepting a special Big Apple award for Mayor **E. Koch** from **James A. Thompsen,** vice president of marketing for Jackson Engineering Company.

The Big Apple, symbol of New York City's economic and entertainment life, was utilized by Jackson Engineering Shipyard recently in a most unusual ceremony. The company designed a flag with the New York City red apple symbol on a field of white. While hundreds of invited guests and shipyard employees looked on, New York City's economic development commissioner **Kenneth S. Schulman** gave the signal that sent the first Big Apple flag up the mast of the USS Waterford (ARD-5). At the same time, flags were raised on the USNS Comet, other vessels in the yard, and a New York City fireboat that presented an impressive water display. The opening and closing flag ceremonies were performed by the color guard from Kings Point Merchant Marine Academy.

In addition to the flag, an appropriate engraved Big Apple Citation was presented to the commanding officers of each vessel. A personal citation was also awarded Mayor **Koch,** honoring him for his continuing efforts on behalf of the maritime industry of the Port of New York.

City councilman **Nicholas LaPorte** praised the shipyard for its ongoing expansion program. Other guest speakers included **L.J. Bettencourt,** first selectman, City of Waterford, Conn.; **Paul Proske,** president, Staten Island Chamber of Commerce; and **John Fanelli,** vice president, New York City Convention Bureau. In addition, representatives from the U.S. Navy, U.S. Coast Guard, Military Sealift Command, and various city agencies attended the affair.

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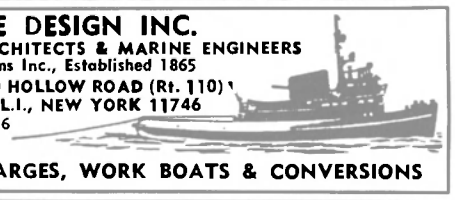

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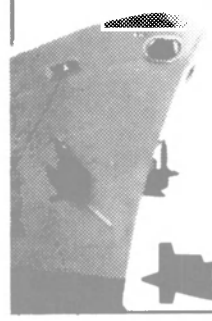

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Clydesdale Towboat Delivered By Balehi

The Percheron, a 65-foot towboat built by Balehi Marine, Inc. of Lacombe, La., was accepted recently by Clydesdale Corporation located in Harvey, La. The new boat is powered by a pair of Detroit Diesel engines supplied by Kennedy Engine Co. of Biloxi, Miss. The owners are **Cliff Spanier** and **Larry Gisclair**, and the design work was done by naval architect **David P. Levy**.

Twin Disc reduction gears, 6½-inch Aquamet 18 stainless-steel shafts, 7-inch Aquamet 18 rudder stocks for both steering, and four flanking rudders combine with a pair of Coolidge 72-inch by 54-inch stainless-steel wheels to assure the Percheron of optimum performance.

Tank capacities are 22,300 gallons of diesel fuel, 9,000 gallons of potable water, and 160 gallons of lube oil.

Towboat Percheron, built by Balehi Marine for Clydesdale Corporation of Harvey, La., is powered by a pair of Detroit Diesel engines supplied by Kennedy Engine Company of Biloxi, Miss.

Pilothouse outfitting includes a Furuno KRA-124 radar, two Nautilus Motorola VHFs, Apelco AH-130 Loudhailer, controls for both Nabrico 40-ton electrohydraulic winches, Perko running lights, Carlisle-Finch chrome-plated over brass searchlights, Buell-Stromberg horns, Custom Hydraulic steering system, and Kobelt engine controls.

Woodwork and cabinetry consist of F.E.Q. teak, fir and formica throughout the interior superstructure to highlight the finishing touches.

LPG/Ammonia Tanker Delivered By Wartsila

Wartsila's Turku shipyard in Finland recently delivered the Golar Frost, a 75,000-cubic-meter gas tanker, to Gotaas-Larsen Shipping Corporation of Liberia. The vessel is designed for transport of liquefied petroleum gases and anhydrous ammonia.

Recently delivered Golar Frost is fifth in a series of 75,000-cubic-meter gas tankers delivered by Wartsila shipyards in Finland.

Powered by a single Wartsila/Sulzer diesel engine of 23,450 bhp, the ship has an overall length of 223 meters, beam of 34.20 meters, draft of 21.60 meters, and depth of 11.60/13.00 meters (731.6 by 112.2 by 70.9 by 38/42.6 feet).

The naming ceremony was performed by **Mrs. Jane Trippe**, wife of Gotaas-Larsen president **K.A.B. Trippe**.

Still on the orderbook at the Turku yard are two sistership of the recently delivered gas tanker; they will be delivered to a Norwegian owner in 1982.

The Golar Frost was built in accordance with the so-called two-cargo principle; it is possible to carry two separate cargoes at the same time. Each cargo has its own separate tanks, loading pipe system, and other necessary equipment.

Although the new vessel is a sistership of four gas tankers delivered earlier by Wartsila, the crew accommodations are built to a much higher standard. All crew members are provided with single cabins with private showers. There are two spare cabins for family members of the crew, as well as a swimming pool and sauna.

Classed by Det norske Veritas, the ship has a service speed of 16.7 knots.

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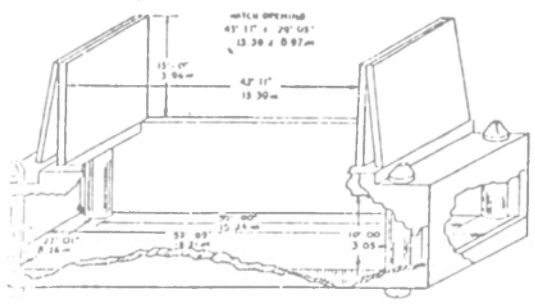

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NOTICE TO BIDDERS

Notice is hereby given that the Department of Transportation, State of Hawaii, will accept sealed bids for the sale of three (3) pilot boats, "as is, where at," all berthed at Honolulu Harbor, Oahu, Hawaii. Sealed bids for each boat will be received at the Office of the Chief, Harbors Division, Department of Transportation, 79 South Nimitz Highway, Honolulu, Hawaii 96813, no later than 2:00 p.m., Hawaiian Standard Time, Tuesday, July 1, 1980, at which time and place they will be publicly opened and read. Bids and modifications or withdrawals thereof received after the time and date fixed for the bid opening will not be considered

A. Kind and General Description of the Property.

The three (3) pilot boats will be sold "as is, where at," and are generally described as follows:

Honolulu Pilot Boat No. 4, HA 160 XS, is a 36-foot, wood-planked and framed, diesel-engined, single-propellered vessel built in Honolulu in 1968. The main engine must be replaced.

Kahului Pilot Boat, O/N HA 143 XS, is a 36-foot, wood-hulled, carvel-planked, 283-horsepower diesel-engined , single-propeller motorboat designed strictly as a pilot boat by Ernie Simmerer and built in Honolulu by Funai in 1968.

Hilo Pilot Boat IV, O/N HA 103 XS, is a 33-foot, wood-hulled, carvel-planked, 280-horsepower gasoline-engined, single-propeller vessel built in Seattle in 1957.

Any person or firm interested in purchasing one or more of the pilot boats through this sale by sealed bids is urged to inspect each boat at its location by making prior arrangements through the Harbors Division District Manager's Office on Oahu, telephone (808) 548-6255.

B. Upset Price.

The upset price for each pilot boat shall be as follows:

Honolulu Pilot Boat No. 4	— $100.00
Kahului Pilot Boat	—$25,000.00
Hilo Pilot Boat IV	—$22,000.00

C. Qualification of Bidder, Auction Sale Procedure and Other Terms and Conditions of Sale.

Said matters are contained in the conduct of sale document and the terms and conditions of the sale by sealed bids, which are on file and open for public inspection during business hours at the Harbors Division Property Management Office, Room 314, 79 South Nimitz Highway, Honolulu, Oahu, Hawaii, telephone (808) 548-2525. In case of conflict with this Notice, the terms and provisions of said documents shall be controlling.

All bid proposals and other documentation shall be on forms furnished by the State. Copies of said documents and forms are available at said office for a nonrefundable fee of $10.00

D. Bidding.

Bids and modifications or withdrawals thereof are subject to the terms and conditions of the conduct of sale documents and should be mailed early to insure receipt in time for bid opening.

E. Approval of Sale.

The sale of each pilot boat is subject to the approval of the Department of Accounting and General Services, State of Hawaii.

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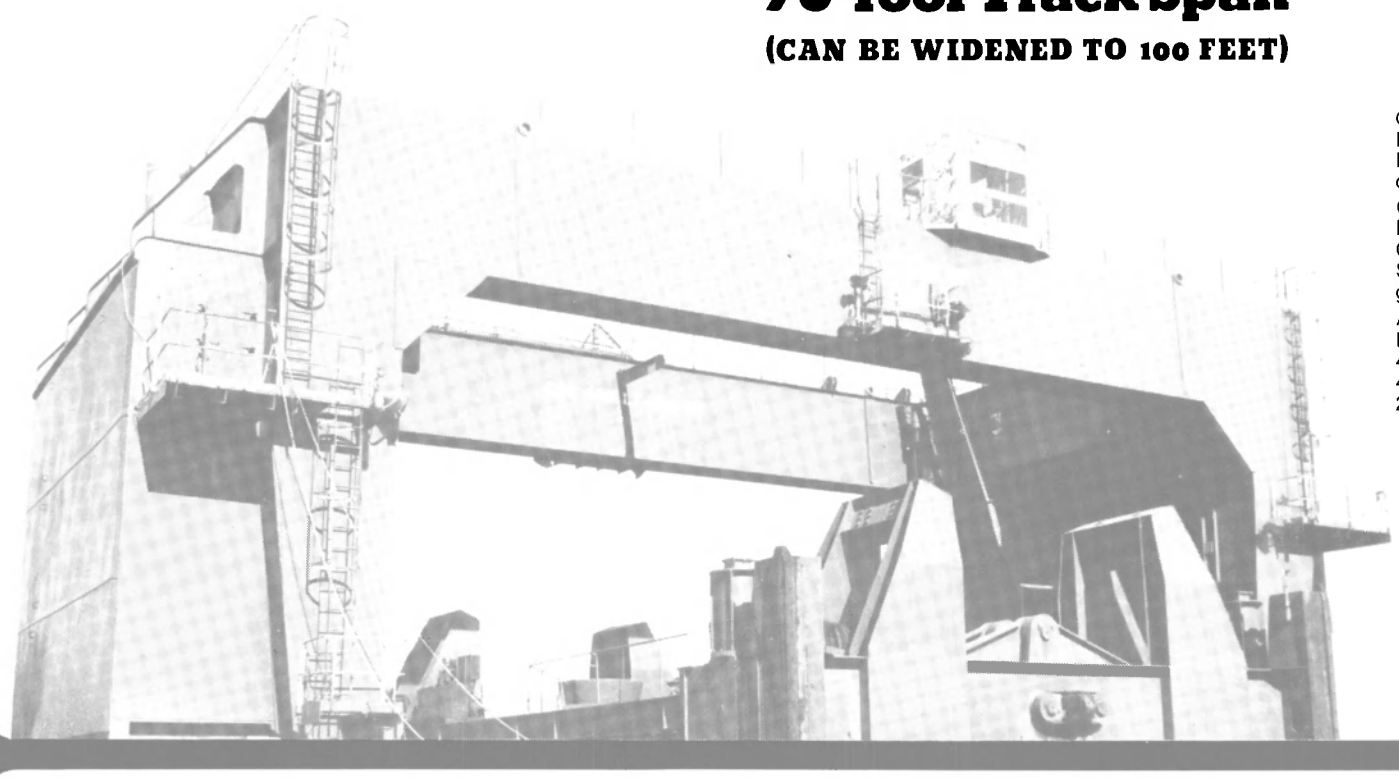
Two 500-ton Gantry Cranes

70-foot Track Span

(CAN BE WIDENED TO 100 FEET)



Originally Barge Handling. As used on LASH Ships. Manufactured by Alliance. Late Model built to ABS and MARAD requirements.

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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Possible other uses:
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5) Steel plants

Geared Track is also available at extra cost

Four 30-ton Container Cranes

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NEW 1970-72

Priced at a fraction of today's new replacement cost. Good Condition. Immediately Available. From LASH Ships. Late Model. Manufactured by PACEO. Suitable for Ship, Barge or Land use. Manufactured to ABS and MARAD requirements.

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

200 HP DC Hoist Motor
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2-40 HP DC Gantry Travel Motors

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30 LT @85 F.P.M.
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Empty Spreader 200 F.P.M.

32'0" Maximum Outstretch

Hoist, Trolley Travel and Gantry Motors are DC and have VSR and VSX regulation.

Hoist and Trolley not shown but are included.

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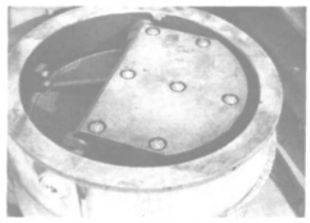

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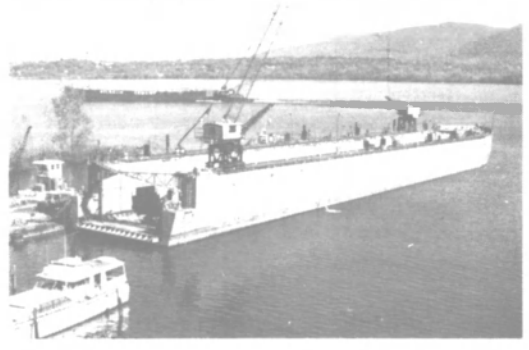

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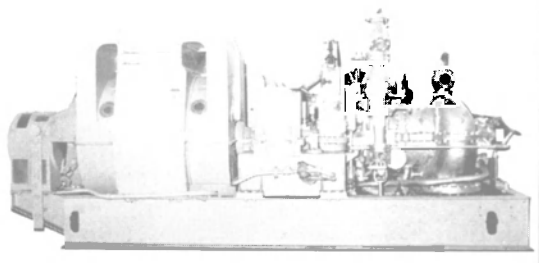

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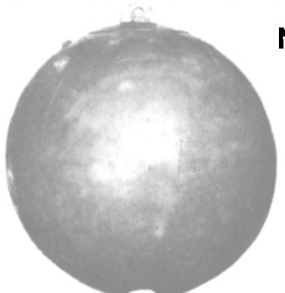

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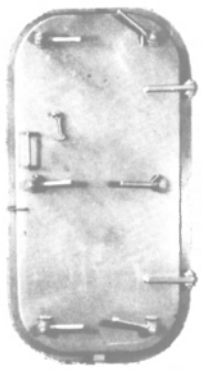

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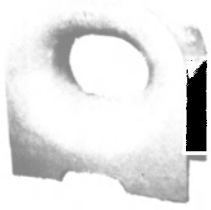

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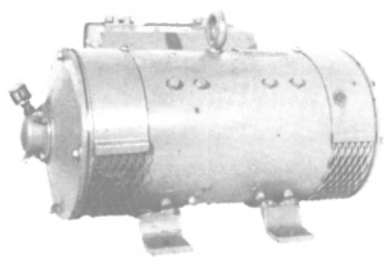

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BEARINGS—Rubber, Metallic, Non-Metallic
Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309
Morse Chain Company, Div. Borg Warner, So. Aurora St., Ithaca, N.Y. 14850
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wisc. 53186

BLASTING—Cleaning—Equipment
GMMC/Porta-Shotblast, 1112 Davidson Road, Nashville, Tenn. 37205
Pepper Industries, Inc., P.O. Box 11367, San Diego, CA 92111

BOILERS—Tube Cleaning
Combustion Engineering, Inc., Windsor, Connecticut 06095
Way-Wolff Associates Inc., 45-10 Vernon Blvd., Long Island City, N.Y. 11101

BRAKES
Goodyear Aerospace (Industrial Brakes Division), Box 477, Berea, KY 40403

BROKERS
Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, La. 70153
Crown Assets Disposal Corp., 300 Notre Dame St., Ville St.-Pierre, Quebec, Canada H8R 3Z6
Daniel Yacht & Ship Brokerage Ltd., 1300 S.E. 17th St., Ft. Lauderdale, FL 33316
Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y., N.Y. 10006
Max Rouse & Sons, Inc., P.O. Box 5250, Beverly Hills, CA 90213

BUNKERING SERVICE
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

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

CLOCKS
Wempe Chronometerwerke Germany, Stubbenhulk 25 2000 Hamburg 11, Germany

COILS—Cooling, Heating, Ventilating
Colmac Coil, Inc., Colville, Wash. 99114

CONTAINERS—Cargo Container Handling
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501

CONTROL SYSTEMS—Monitoring
Arnessen Marine Systems, Inc., One Battery Plaza, New York, NY 10004
Foxboro Marine Operations, P.O. Box 435, Burlington, Mass. 01803
Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913
Megasystems, Inc., 5909 West 130th Street, Cleveland, OH 44130
Seatronic Engineering & Mfg. Co., 1230 E. Joppa Rd., Towson, MD 21204
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.
Transamerica Delaval, Inc., Gem Sensors Div., Spring Lane, Farmington, CT 06032

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

CRANES—HOISTS—DERRICKS—WHIRLEYS
Clyde Iron, a unit of AMCA International Corp., Suite 102, 2300 West Loop South, Houston, TX 77027
M. P. Howlett, Inc., 410 32nd St., Union City, N.J. 07037
J.D. Neuhaus, Witten-Heven, Hebezeuge, D 5810 Witten-Heven, West Germany
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501

DECK COATINGS—Non-skid
Selby, Battersby & Co., 5220 Whiby Ave., Philadelphia, PA 19143

DECK MACHINERY—Cargo Handling Equipment
Appleton Machine Co., Marine Division, 618 S. Oneida St., Appleton, WI 54911
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134
New England Trawler Equipment Co., 291 Eastern Ave., Chelsea, MA 02150

DIESEL ACCESSORIES
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

DOORS—Watertight—Joiner
Walz & Krenzer Inc., 400 Trabold Road, Rochester, N.Y. 14624

DRAFTING EQUIPMENT
AM Bruning, 1834 Walden Office Square, Schaumburg, IL 60196

ELECTRICAL EQUIPMENT
Argo Marine, Div. of Argo Intl., 140 Franklin St., New York, N.Y. 10013
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
American United Marine Corp., 575 Madison Ave., New York, NY 10022
Hoffert Marine, Inc., 265 Franklin Ave., Nutley, N.J. 07110

EQUIPMENT—Marine
Argo Marine, Div. of Argo Intl., 140 Franklin St., New York, N.Y. 10013
Baldt, Inc., P.O. Box 350, Chester, PA 19016
Comet Marine Supply Corp., 157 Perry St., New York, N.Y. 10014
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, N.Y. 10550
Schnitzer-Levin Marine Co., 445 Littlefield Ave., So. San Francisco, CA 94080
Sudoimport, 5 Kalyaevskaya, Moscow K-6, USSR
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wisc. 53186

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

EXPANDED METALS
Washington Iron Works, 1500 Sixth Avenue South, Seattle, WA 98134

FANS—VENTILATORS—BLOWERS
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
Morse Chain Company, Div. Borg Warner, So. Aurora St., Ithaca, N.Y. 14850
Seaward International, Inc., 6269 Leesburg Ave., Falls Church, Va. 22044

FINANCING—Leasing
Continental Illinois National Bank, 231 S. LaSalle, Chicago, IL 60693
General Electric Credit Corp., P.O. Box 8300, Stamford, Conn. 06904
Greyhound Leasing & Financial Co., Greyhound Tower, Phoenix, AZ 85077
Kidder, Peabody & Co., Inc., 10 Hanover Square, New York, N.Y. 10005
Salomon Brothers, One New York Plaza, New York, N.Y. 10004
Warburg Paribas Becker, Inc., 2 First National Plaza, Chicago, Ill. 60670

FITTINGS & HARDWARE
Custom Alloy, 2040 N. Loop W., Houston, TX 77018
Robvon Backing Ring Co., 675 Garden St., Elizabeth, N.J. 07207

FURNITURE
Bailey Joiner Co., Inc., 74 Sullivan Street, Brooklyn, N.Y. 11231
IDT Corp. (Intersystems Design & Technology Corp.), P.O. Box 1590, Summerville, S.C. 29483

GANGWAYS
Rampmaster Inc., 1226 N.W. 23rd Ave., Fort Lauderdale, Fla. 33311

HATCH & DECK COVERS—Chain Pipe
MacGregor-Comarain, Inc., 135 Dermody St., Cranford, N.J. 07016
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696
Mechanical Marine Co., 900 Fairmount Ave., Elizabeth, N.J. 07027
Julius Mack & Sons, Inc., 20 Vesey St., New York, NY 10017

HULL CLEANING
Butterworth Systems Inc., 224 Park Ave., Florham Park, N.J. 07932
Phosmarin Equipment (Phoceenne Sous-Marine S.A.), 21 Boulevard de Paris, 13002 Marseille, France
Sub Enterprises, Inc., P.O. Box 16531, Irvine, CA 92713

HYDRAULICS
Voss, Inc., Building J, 7029 Huntley Road, Columbus, Ohio 43229

INERT GAS—Generators—Systems
Camar Corporation, P.O. Box 460, Worcester, MA 01613
Foster Wheeler Boiler Corp., 110 So. Orange Ave., Livingston, N.J. 07039
Fredriksstad mek. Verksted, N. American Agents, American United Marine Corp., 575 Madison Ave., New York, N.Y. 10022

INFORMATION—Marine
Maritime Data Network, 300 Broad Street, Stamford, CT 06901

INSULATION—Cloth, Fiberglas
Bailey Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
Dupont Company, Nemours Bldg.-RM C31H6, Centre Rd. Bldg., Wilmington, DE 19898
IDT Corp. (Intersystems Design & Technology Corp.), P.O. Box 1590, Summerville, S.C. 29483

INSURANCE
Adams & Porter, 1819 St. James Place, Houston, Texas 77027
Adams & Porter, 5 World Trade Center, Suite 6433, New York, N.Y. 10048
Alexander & Alexander, Inc., 1185 Ave. of the Americas, New York, N.Y. 10036
Midland Insurance Co., 160 Water St., New York, N.Y. 10038
Whitehall Brokerage, Inc., 17 Battery Place, New York, NY 10004

KEEL COOLERS
Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062

LADDERS
Duo-Safety Ladder Co., 513 West 9th Ave., P.O. Box 497, Oshkosh, Wisc. 54901

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
Oceanic Electrical Mfg. Co., 157 Perry Street, New York, N.Y. 10014
Oreck Corp., 100 Plantation Rd., New Orleans, LA 70123
Perko Inc., P.O. Box 6400D, Miami, Florida 33164
Phoenix Products Company, 4785 North 27th Street, Milwaukee, WI 53209
Port Electric Supply Corp., 157 Perry Street, New York, N.Y. 10014

LNG CONTAINMENT
McDonnell Douglas Astronautics Co., 5301 Bolsa Ave., Huntington Beach, CA 92647

LUMBER
R.N. Templeman, Inc., 3000 Perdido St., New Orleans, LA 70119

MACHINE TOOLS
Climax Manufacturing Company, P.O. Box 230, Newberg, OR 97132
Master Machine Tools, Inc., 1300 East Avenue A, Hutchinson, Kansas 67501

MACHINERY MAINTENANCE, REPAIR, AND OVERHAUL
General Electric Company — Bldg. 2, Rm 216, Schenectady, N.Y. 12345

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

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Marine Enterprises, Inc., Suite 500, 2341 Jefferson Davis Highway, Arlington, Va. 22202
Agemar, Avenida 3E No. 71-51, Edif. Acuario (Planta Baja) Apartado 1465, Maracaibo, Venezuela
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, 8207 Glen Loch, Houston, Texas 77061
Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
CCS Marine Associates Ltd., 2784 Crescentview Drive, N. Vancouver, B.C. Canada V7R2V1
C.D.I. Marine Co., Regency East, Suite 222, 9951 Atlantic Blvd., Jacksonville, Florida 32211
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 P. 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., 3308 Tulane Ave., New Orleans, La. 70119
Designers & Planners Inc., One State Street Plaza, New York, N.Y. 10004
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
Gibbs & Cox, Inc., 40 Rector Street, New York, N.Y. 10006
John W. Gilbert Associates, Inc., 58 Commercial Wharf, Boston, Mass. 02110
L.R. Glosten & Associates, Inc., 610 Colman Bldg., 811 First Ave., Seattle, Wash. 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
Hydronautics, Incorporated, 7210 Pindell School Road, Howard County, Laurel, Maryland 20810
Jantzen 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
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
Harry Meneian, 15 Lakeshore Rd., St. Catharines, Ontario, Canada L2N 2S7
Metritape, Inc., 33 Bradford Street, Concord, MA 01742
Nelson & Associates, Inc., 1405 N.W. 167th Street, Miami, FL 33169
Nickum & Spaulding Associates, Inc., 911 Western Ave., Seattle, WA 98104
Robert B. Niederberger, P.E., 507 Evergreen Road, Severna Park, MD 21146
Norgaard and Clark, 114 Sansome St., San Francisco, CA 94104
Ocean-Oil International Engineering Corporation, 3019 Mercedes Blvd., New Orleans, La. 70114
PRC Guralnick, 5252 Balboa Ave., San Diego, CA 92117
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156
S.L. Petchul, Inc., 1380 SW 57th Ave., Fort Lauderdale, Fla. 33317
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
The Stanwick Company Maritime Systems Department, 3661 E. Virginia Beach Blvd., Norfolk, VA 23502
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
Arne G. Svendsen, 58 Bonniefield Drive, Tiverton, R.I. 02878
Richard R. Taubler Inc., 8 Columbia St., Milford, Del. 19963
Thames Engineering Consultants Inc., P.O. Box 589, New London, Ct. 06320
Timsco, 951 Government St., Suite 2161, Mobile, Alabama 36604
Corning Townsend III, 18 Church St., Georgetown, CT 06829
Undersea Systems, 112 W. Main St., Bay Shore, N.Y. 11706
Wesley D. Wheeler Associates, Ltd., 104 East 40 St., Suite 207, New York, N.Y. 10016
Thomas B. Wilson, 920 North Avalon Blvd., Wilmington, CA 90744
XPLO Corporation, 229 Fifth Street, Gretna, LA 70053

NAVIGATION & COMMUNICATIONS EQUIPMENT
American Hydromath Co., Buckwheat Bridge Rd., Germantown, N.Y. 12526
Collins Marine Corp., Pier 32, San Francisco, CA 94105
Communication Associates, Inc., 200 McKay Road, Huntington Station, N.Y. 11746
Comsat General Corp., 950 L'Enfant Plaza, S.W., Washington, D.C. 20024
Dantronics Co., P. O. Box 673, Rye, NY 10580
Electro-Nav, Inc., 1201 Corbin St., Elizabeth Marine Terminal, Elizabeth, N.J. 07201
EPSCO, Inc., 411 Providence Highway, Westwood, Mass. 02090
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
Galbraith Pilot Marine Division, 166 National Road, Edison, NJ 08817
Harris Communications, RF Communications Division, 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 Decca Marine Inc., P.O. Box G, Palm Coast, Fla. 32037
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
Krupp Atlas—Elektronik, A Div. of Krupp Intl. Inc., P.O. Box 68218, Houston, Texas 77058
Maritel Inc., 2510 Riva Road, Annapolis, Md. 21401
Motorola Communications & Electronics Inc., 17-22 Whitestone Expressway, Whitestone, NY 11357
Nav-Com, Inc., 2 Hicks Street, North Lindenhurst, N.Y. 11757
Navidyne Corp., 11824 Fishing Point Drive, Newport News, VA 23605
Navigation Communications Systems, Inc., 20100 Plummer Street, Chatsworth, CA 91311
North American Philips Communication Corp., 91 Mckee Road, Mahwah, N.J. 07430
RCA Service Co., Building 204-2, Camden, N.J. 08101
Radar Devices, Inc., 2955 Merced Street, San Leandro, CA 94577
Raytheon Marine Co., 676 Island Pond Road, Manchester, N.H. 03103
Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
Rockwell International, Collins Telecommunications Products Division, Cedar Rapids, IA 52406

Simrad Inc., 1 Labriola Court, Armonk, N.Y. 10504
SI-TEX, P.O. Box 6700, Clearwater, FL 33518
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.
Texas Instruments Inc., P.O. Box 226080, M/S 3107, Dallas, TX 75265
Tracor, Inc., Industrial Products Div., 6500 Tracor Lane, Austin, Texas 78721

OILS—Marine—Additives
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
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002
A. Margolis & Sons Corp., One World Trade Center, Suite 8751, New York, N.Y. 10048
Mobil Oil Corporation, 150 East 42nd St., New York, N.Y. 10017
Texaco, Inc. (International Marine), 135 East 42nd St., N.Y., N.Y. 10017

OIL/WATER SEPARATORS
Alfa-Laval, Inc., 2115 Lindwood Avenue, Ft. Lee, NJ 07024
Butterworth Systems Inc., 224 Park Ave., Florham Park, N.J. 07932

PAINTS—COATINGS—CORROSION CONTROL
Belzona Molecular Metalife Inc., 224 7th Street, Garden City, NY 11530
"CONSOL" manufactured by Hanline Bros., Inc., 1400 Warner St., Baltimore, MD 21230
Devoe & Raynolds Co., Inc., P.O. Box 7600, Louisville, Ky. 40207
Eureka Chemical Company, 234 Lawrence Ave., So. San Francisco, CA 94080
International Paint Co., 17 Battery Place North, Suite 1150, New York, N.Y. 10004
Mobil Chemical Co., Maintenance & Marine Coatings Dept., P.O. Box 250, Edison, N.J. 08817
The Skybryte Co., 3125 Perkins Ave., Cleveland, OH 44114
Woolsey Marine Industries, Inc., 100 Saw Mill Rd., Danbury, CT 06810

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

PIPE—HOSE—Cargo Transfer, Clamps, Couplings
Camlock Flange Sales Corp., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696
Hydro-Craft, Inc., 4223 Edgeland, Royal Oak, Mich. 48073
Kubota, Ltd., 22, Funade-cho 2-chome, Naniwa-Ku, Osaka, Japan
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

PLASTICS—Marine Applications
Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
Alco Power Inc., 100 Orchard St., Auburn, N.Y. 13021
Alsthom-Atlantique, 2 quai de Seine, 93203 Saint-Denis, France
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, One State Street Plaza, New York, N.Y. 10004
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Caterpillar Tractor Company, Engine Division, Peoria, IL 61629
Colt Industries' Fairbanks Morse Engine Division, Beloit, Wisc. 53511
Combustion Engineering, Inc., Windsor, Connecticut 06095
Coolidge Propellers, 1601 Fairview Ave. East, Seattle, Wash. 98102
Electro-Motive Division, General Motors Corp., LaGrange, Ill. 60525
Elliott Company, (Div. of Carrier Corp.), Jeanette, PA 15644
General Electric Co., Diesel Power Products, 2901 E. Lake Rd., Erie, PA 16531
MTU of North America, Inc., 10450 Corporate Drive, Sugar Land, TX 77478
Maritime Industries, Ltd., 6307 Laurel St., Burnaby, B.C. Canada V5B 3B3
Michigan Wheel/Gulf Coast, P.O. Box 1528, Pascagoula, MS 39567
Motive Power Corp., P.O. Box 365, Mineola, NY 11501 70124
Omnithruster Inc., 16837 So. Normandie Ave., Gardena, CA 90247
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
Tacoma Boatbuilding Co./Escher Wyss, 1840 Marine View Dr., Tacoma, WA 98422
Transamerica DeLaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621
Transamerica Delaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, N.J. 08650
Voith Schneider of America—U.S. Agent: Eli Sharprut, 347 Evelyn St., Paramis, N.J. 07652

PUMPS—Repairs—Drives
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030
Transamerica Delaval, Inc., IMO Pump Div., P.O. Box 321, Trenton, NJ 08602
Warren Pumps, Inc., Bridges Ave., Warren, Mass. 01083
Worthington Pump Inc., P.O. Box 1250, Mountainside, N.J. 07092

REELS—Coiling Systems
Reel-O-Matic Systems, Inc., 418 Hellman St., Wrightsville, Pa. 17368

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
Jackson Rope Co., Reading, Pa. 19603
Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110
Tubbs Cordage Co., Orange, CA 92666

RUDDER ANGLE INDICATORS
Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

SALVAGE
Levin Metals Corp., 1310 Canal Blvd., Richmond, CA 94807

SANITATION DEVICES—Pollution Control
Argo Marine Pollution Systems Division, 140 Franklin St., New York, N.Y. 10013
Demco, Inc., P.O. Box 94700, Oklahoma City, OK 73109
Envirovac (Division of Dometic Inc.), 1260 Turret Drive, Rockford, IL 61111
Marine Moisture Control Co., Inc., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696
Marland Environmental Systems, Inc., N. Main Street, Walworth, WI 53184
Microphor, Inc., P.O. Box 490, Willits, CA 95490
Red Fox Industries, P.O. Drawer 640, New Iberia, LA 70560
Research Products/Blankenship, 2639 Andjon, Dallas, Texas 75220
St. Louis Ship FAST Sewage Systems, 611 East Marceau St., St. Louis, Mo. 63111
Sigma Treatment Systems, 2 Davis Ave., Frazer, PA 19355

SCAFFOLDING EQUIPMENT—Work Platforms
Patent Scaffolding Co., 2125 Center Ave., Fort Lee, N.J. 07024
Spider Staging Sales Co., P.O. Box 182, Renton, Washington 98055
Trus Joist Corp., P.O. Box 60, Boise, Idaho 83707

SHAFT SEALS, REVOLUTION INDICATOR EQUIPMENT
Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

SHIPBREAKING—Salvage
American Ship Dismantlers, Inc., Division of Schnitzer Industries, 3300 N.W. Yeon Avenue, Portland, Ore. 97210
The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202
National Metal & Steel Corp., 691 New Dock St., Terminal Island, Cal. 90731
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

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

SHIPBUILDING—Repairs, Maintenance, Drydocking
A.D.M. (Amsterdam Drydock Mfg.), Moatschappij bv, P.O. Box 3006, 1003 AA, Amsterdam, Holland
Asmar Shipyards Co., Astilleros y Maestranzs de la Armada, Prat 856, Piso 14, Casilla 150-V, Valpariso, Chile, S.A.
Astilleros Unidos de Veracruz, S.A., San Juan de Ulua S/N, Apdo. Postal 647, Veracruz, Ver., Mexico
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150
Bergeron Industries Inc., P.O. Box 38, St. Bernard, La. 70085
Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004
Blohm + Voss AG, D-2000 Hamburg 1, P.O.B. 10 07 20
Blohm + Voss Co., 55 Morris Ave., Springfield, N.J. 07081
Blount Marine Corp., P.O. Box 368, Warren, RI 02885
Boeing Marine Systems, P.O. Box 3707, Mail Stop 14-11, Seattle, WA 98124
Ira S. Bushey & Sons, Inc., 764 Court Street, Brooklyn, N.Y. 11231
Camden Ship Repair Co., Inc., Point & Erie Streets, Camden, N.J. 08102
Carrington Slipways Pty, Ltd., Old Punt Road, Tomago, N.S.W., Australia 2322
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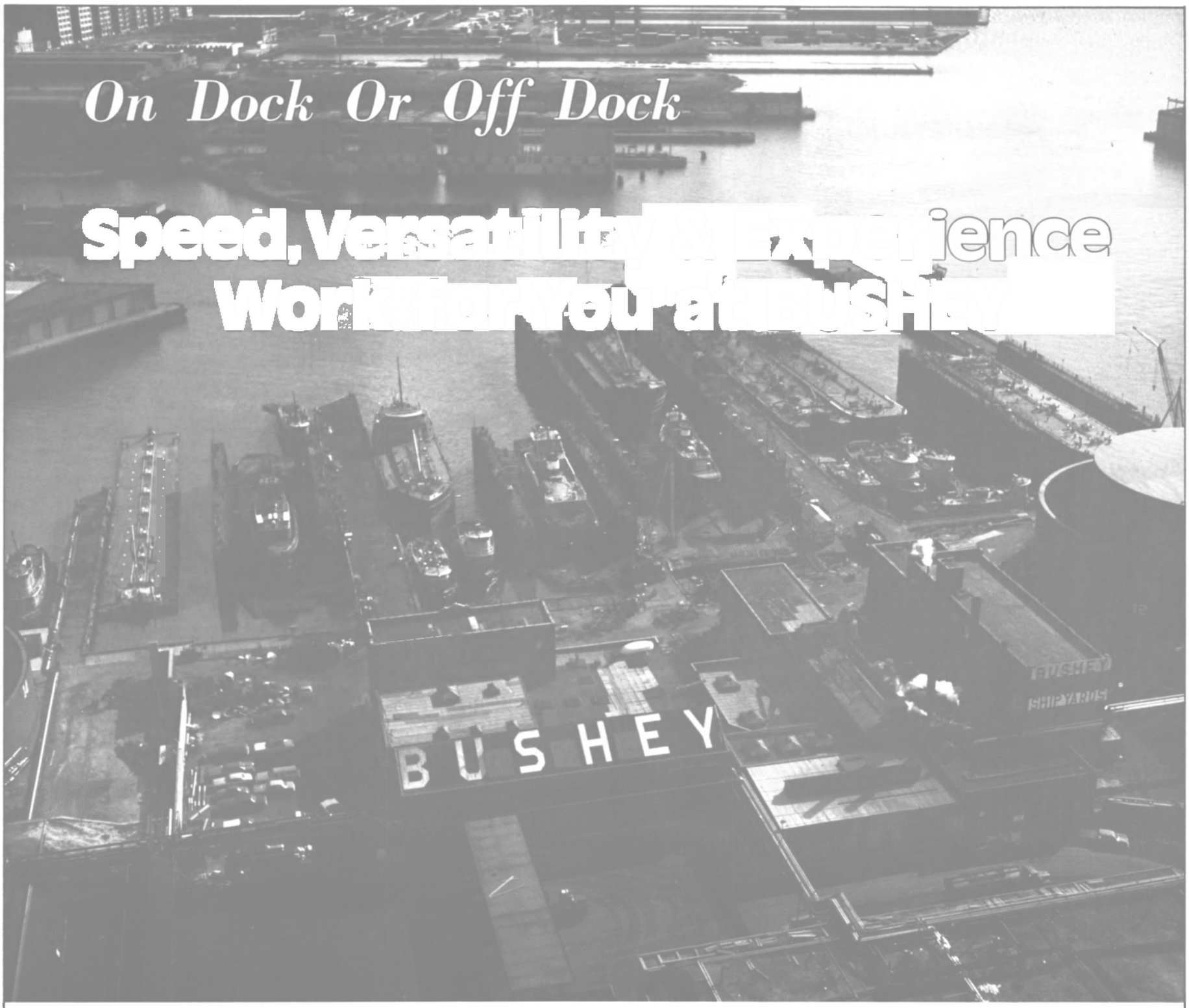

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