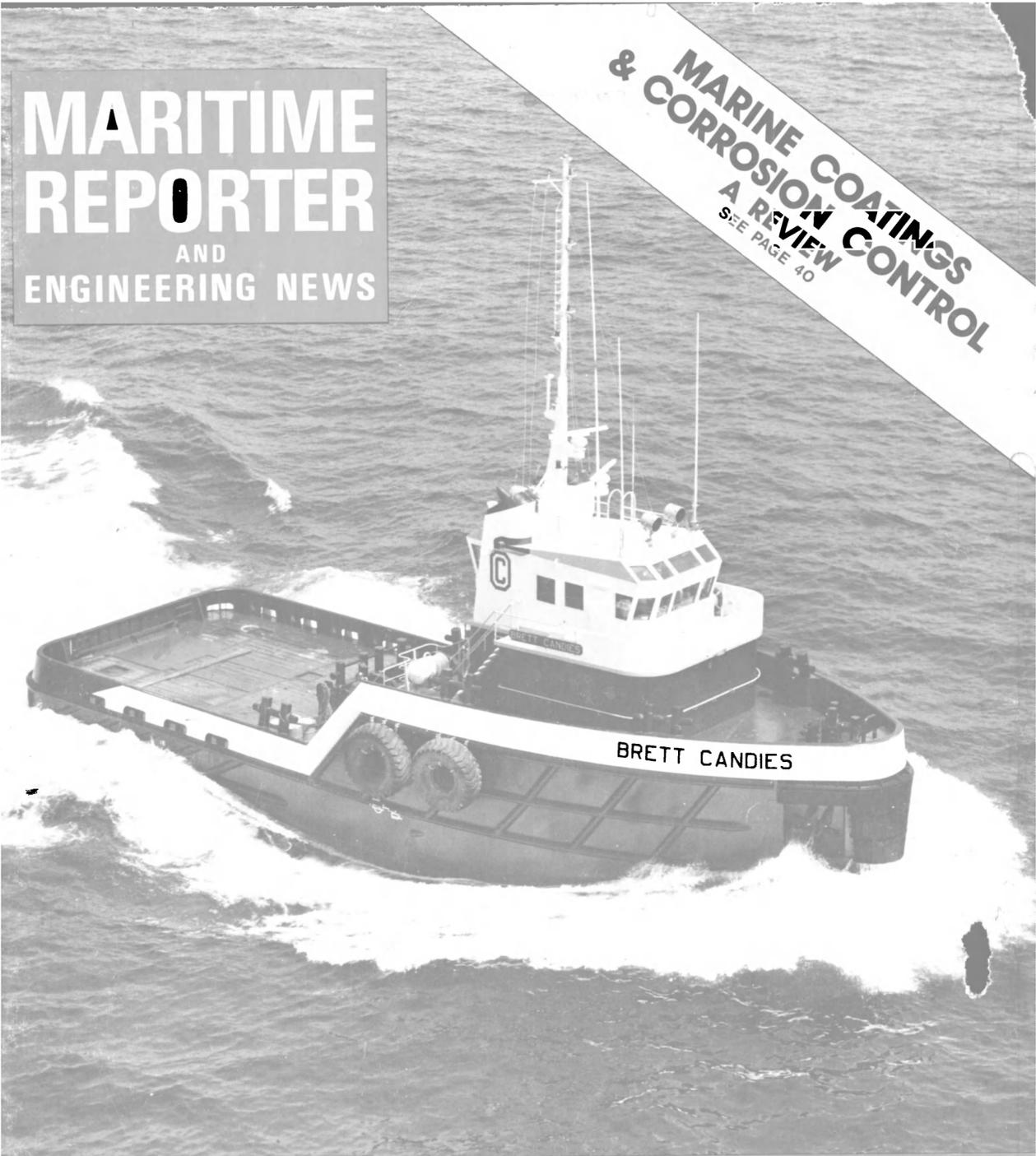


**MARITIME  
REPORTER**  
AND  
ENGINEERING NEWS

**MARINE COATINGS  
& CORROSION CONTROL**  
A REVIEW  
SEE PAGE 40



Brett Candies

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Tugs To Otto Candies**  
(SEE PAGE 10)

**AUGUST 1, 1981**

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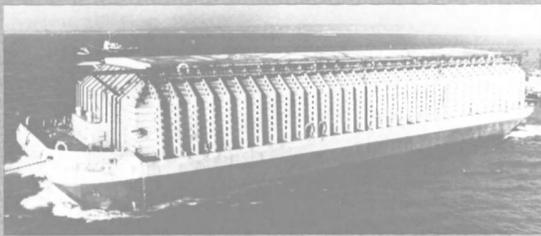
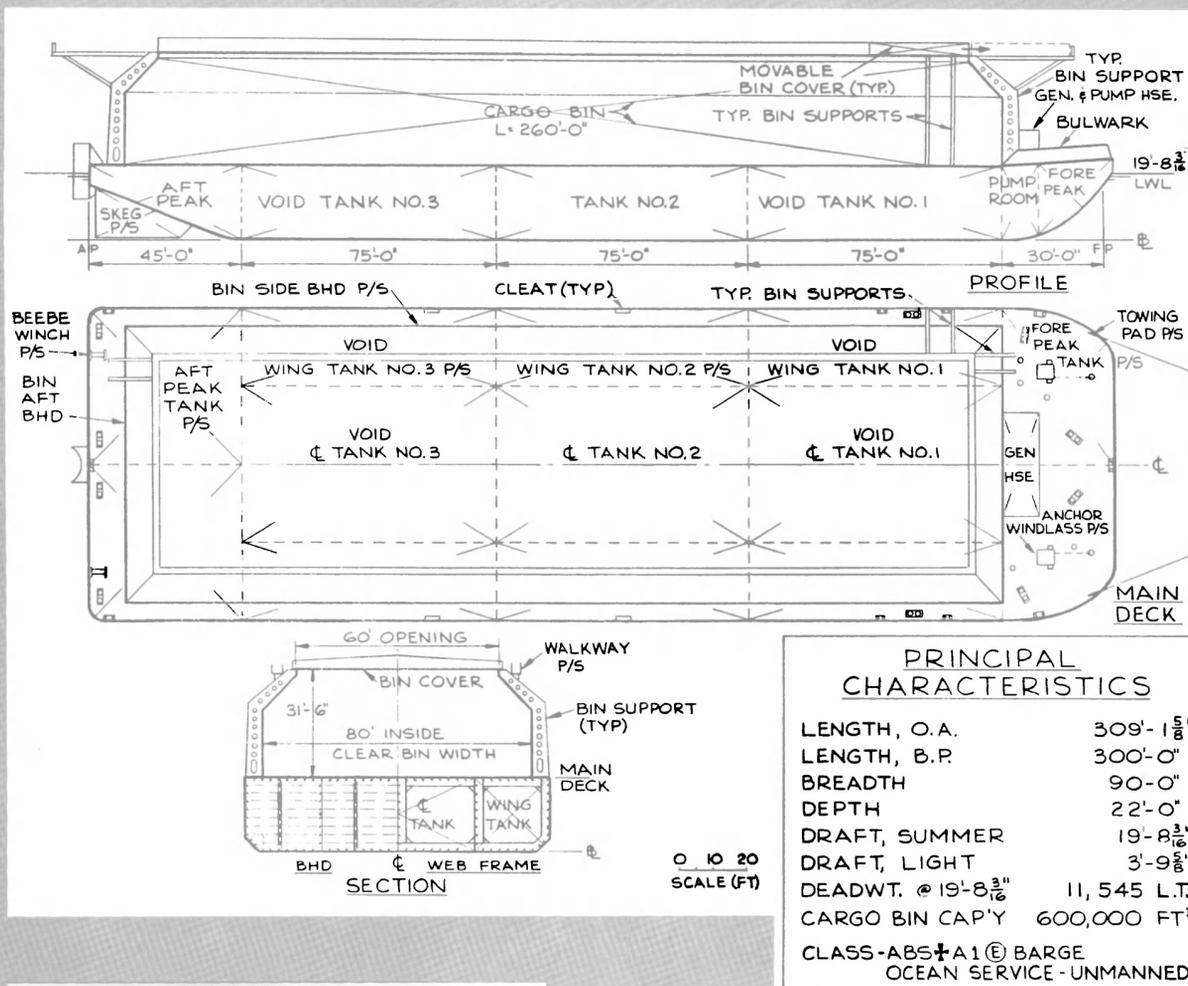
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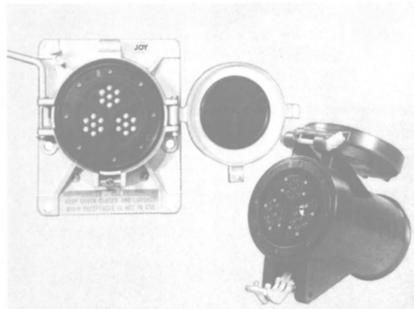
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**143 Ships In Five-Year  
Naval Shipbuilding Plan**

Pentagon correspondent Charles W. Corddry recently reported in The Baltimore Sun: "The Navy has proposed a vastly expanded five-year shipbuilding plan calling for 143 ships—including two nuclear-powered aircraft carriers—that could double the construction budget of the service already most favored financially under Administration defense goals."

In addition to carriers (CVN) and several Trident submarines (SSBN), he says the plan anticipates 17 Aegis cruisers (CG-47 class), 14 attack submarines (SSN-688 class), six destroyers (DDG class), nine guided missile frigates (FFG-7 class), nine amphibious ships, and "86 others for fleet support, mine warfare, (and) storage of equipment. . . ."

"The Navy's proposal, on which the defense chief (Secretary Caspar W. Weinberger) and his staff have yet to act," Mr. Corddry adds, "would increase by more than 75 percent the number of ships in the last five-year construction plan given Congress by President Jimmy Carter. The Navy hopes to expand the active fleet to 600 ships by 1988. That would be a net gain of about 150 vessels. . . ."

**R.A. Simpson Promoted  
To Newly Created VP  
Post At Crowley Division**

Richard A. Simpson has been promoted to the newly created position of vice president, common carrier services of Crowley Maritime Corporation's Caribbean Division, according to a recent announcement by Robert G. Homan, Jacksonville, Fla., Crowley senior vice president and general manager of the division.

The new position was established to unify the division's common carrier services under one organization unit. Mr. Simpson assumes responsibilities for the operations, maintenance, marketing and sales, pricing and regulatory matters and all division offices in the United States and the Caribbean. Previously vice president of marketing for Crowley's Caribbean Division, he has some 25 years' experience in transportation and marketing. He is based at the division headquarters in Jacksonville.

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(USPS 016-750)  
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**Lehman Joins Bultema  
Marine Transportation**



John T. Lehman

The appointment of **John T. Lehman** as naval architect/projects manager for Bultema Marine Transportation Inc., has been announced by **Ronald G. Bublick**, vice president. A subsidiary of The Canonic Companies, Inc., which was named the largest excavation and foundation specialty contractor in the United States by an Engineering News-Record independent survey, specializes in foundations, earthmoving, power plant construction, marine construction, dredging, and chemical waste isolation.

Since receiving his degree in engineering/naval architecture from The University of Michigan, Mr. **Lehman** has been working for a large naval architectural design firm in Sturgeon Bay, Wis. His position was staff naval architect in the Hull Technical Department.

**Southwest Marine  
Purchases San Pedro  
Yard From Beth Steel**

Southwest Marine, Inc., San Diego, Calif., has announced that the purchase of Bethlehem Steel's shipyard in San Pedro, Calif., has been finalized. Operations began immediately following the announcement, with a management team and staff of 50. Steadily increasing staff additions are anticipated until a manpower level of 350-500 is reached. The San Pedro facility, with its 22,000-ton drydock, gives Southwest Marine the ability to handle much larger ships, according to **Arthur Engel**, president of Southwest Marine, Inc. "We intend to continue our all-out blitz on the commercial and naval work available. The acquisition of the San Pedro yard and the 22,000-ton drydock allows us to handle a wide variety of large ships including tankers, barges and cargo ships. We also have knowledge that more Navy ships will be located in the Long Beach area, and we intend to get a good portion of their work."

Mr. **Engel** announced that **Gerald Smith** will be relocated from Southwest Marine's San Diego facilities as general manager. **David Engel** will also be relocated from San Diego as San Pedro's production manager. Both men have extensive ship repair man-

agement backgrounds. Southwest Marine intends to staff the management team internally from its San Diego yard.

The San Pedro acquisition gives Southwest Marine three yards along California's coast. The San Pedro yard joins Southwest Marine's San Diego and San Francisco facilities. "We foresee further expansion in the not too distant future," said Mr. **Engel**, "perhaps up to the Seattle and/or Portland areas. Our intention is

to allow our customers and the shipping industry the convenience of Southwest Marine's services anywhere on the West Coast."

**Gerald Smith**, Southwest Marine's San Pedro general manager, gave some specifics on the yard. "San Pedro will have total ship repair capability," he stated. "We will be a completely self-sufficient yard. We have full shop services including machine and rigging shops, electrical, sheet metal, carpentry and pipefitting shops, a

complete tool room, as well as a five-story warehouse and an administrative building. Our pier facilities are tremendous. We have four piers with lengths from 548 feet to 1,796 feet. Each has a full range of utilities including electrical power, lines for high-pressure steam oxygen, acetylene, compressed air and natural gas, along with fresh and salt water." The yard itself is 24 1/2 acres and was purchased in excess of \$3.5 million.

# The competition hopes you don't read this.

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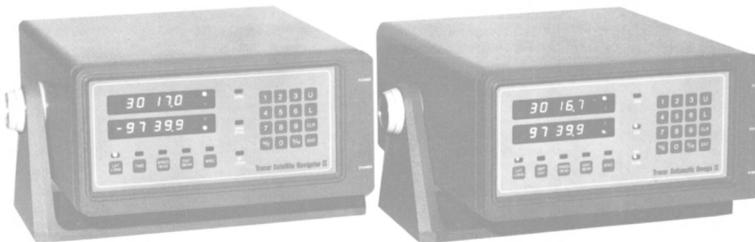
DNV, DHI, Swiss PTT, the Norwegian Maritime Directorate, and DSRK.

They hope you don't discover Tracor's three frequency Automatic Omega II has been awarded the NMEA Omega award based on demonstrated performance and reliability for the fourth consecutive year.

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Discover Tracor. For your free copy of the Technical paper entitled "Integrated Satellite/Omega Navigation Systems" as well as brochures and further details of Tracor's advanced navigation systems, call or write today.



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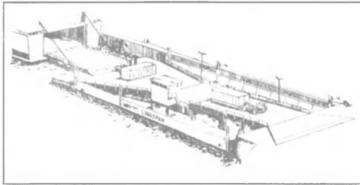
## Tracor Instruments

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**Navire Cargo Gear Wins  
Kuwait Linkspan Contract**

The Port of Shuaiba in Kuwait is to be the location for the latest Navire Cargo Gear linkspan. It will be built in Kuwait by Kuwait Shipbuilding and Repairyard Company.

This linkspan was designed by Navire Cargo Gear in conjunction with Shuaiba Port officials to meet tidal conditions at Shuaiba, and with regard to traffic conditions expected. The linkspan is the floating pontoon type and is designed to handle the largest roll-on/roll-off vessels currently planned. Cargo handling capabilities include 40-foot containers on trailers, forklift trucks carrying full containers, roll trailers and ab-



Navire Cargo Gear linkspan for Port of Shuaiba consists of a two-part ramp atop straightforward pontoon.

normal loads of up to 120 tons on special heavy-duty trailers.

The pontoon has a maximum displacement of approximately 1,100 tons, a length overall of 40 meters (about 131 feet), and a breadth

of 22.5 meters (about 74 feet). The ramp mounted on this pontoon is in two sections, the shoreside part is 24 meters long (79 feet) and has a 9-meter-wide driveway (30 feet), sufficient for two-way traffic. The seaward section of the ramp is 18 meters long (59 feet), with the 9-meter-wide roadway splaying out to 22 meters (72 feet) to accommodate the widest of RO/RO vessel stern ramps.

The linkspan will accommodate vessels at all tide stages.

Delivery of the unit to Shuaiba Area Authority is scheduled for April 1982.

**Detroit Diesel Engines  
Commercial Marine Models  
—Brochure Available**

The Detroit Diesel Allison Division of General Motors, Detroit, Mich., has published a full-color brochure describing their complete line of marine diesel engines for propulsion and auxiliary power.

The brochure clearly describes the broad line of Detroit Diesel models available from the Series 53 (100-173 shp) for smaller workboats; through the Series 71 (115-583 shp) for fast crewboats and fishing boat application; and the Series 92 (230-690 shp) for compact weight-to-horsepower ratios; to the Series 149 (675-1,280 shp) for workboats, crew and cargo boats, river towboats, ocean and harbor tugs.

Also listed are options and related accessories available from Detroit Diesel dealers, as well as information on Detroit Diesel engines for shipboard auxiliary power applications, electric sets, and engines for pumps and other equipment.

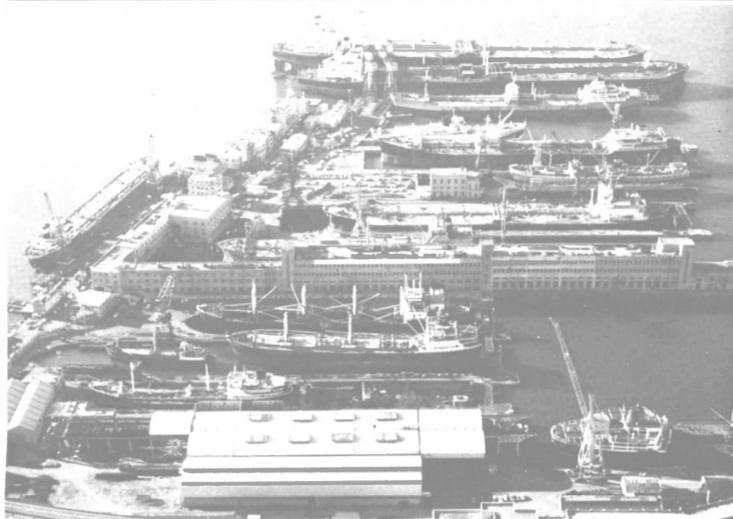
For a copy of the brochure "Detroit Diesel Engines—Commercial Marine Models,"

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**Tracor Marine Salvages  
500-Ton Restaurant Vessel**



Tracor Marine, Inc. of Fort Lauderdale, Fla., recently succeeded in raising the 500-ton, 165-foot restaurant ship Livingstone Landing (shown above) from the bottom of



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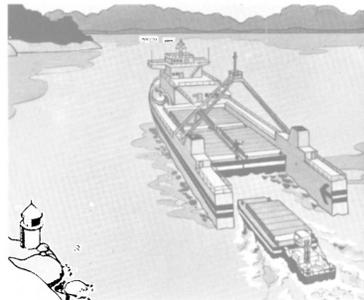
U.S.A. Correspondent  
Porter Continental Marine, Inc.  
(James R. Porter) 250 Park Ave., Suite 815, N.Y., N.Y. 10017  
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New River in Fort Lauderdale under a time-limited, no cure/no pay contract with the Lexington Insurance Company. The vessel, built in 1936, was formerly the U.S. Coast Guard cutter Nemesis; she is reported to be the only USCG ship to have sunk an enemy submarine during World War II.

While the salvage operation was completed in only 10 days by parbuckling the vessel, installing cofferdams, patching, and pumping, the job was particular challenging because the vessel's conversion to a restaurant involved cutting out many bulkheads and decks, and building a new superstructure that adversely affected the vessel's stability, free surface area, and structural integrity while submerged.

Under the direction of Jim Jacobs, project manager, salvage master Leon Ryder, and Ed Mosher, diving supervisor, resources from Tracor Marine's Shipyard and Ocean Technology Divisions were utilized. The success of the Livingstone Landing salvage operation is evidence of Tracor's growing commitment to provide timely, cost-effective salvage services.

#### Valmet Yard To Build Feeder Type Barge Carriers For Soviets



According to an agreement signed in Moscow recently, Valmet Oy Helsinki Shipyard will deliver two 8,700-dwt barge-carrying vessels of a new type (shown above) to the USSR in 1983. The vessels are of the feeder type, which will operate at the ends of main ocean routes distributing and collecting barges. The vessels can also be used as independently operating systems on short routes in such areas as the Baltic Sea and Southeast Asian Archipelago. The vessels will be able to carry six Danube Sea-Barges. The contract is worth about \$67.5 million, and includes two 600-bhp pusher tugs, one for each feeder vessel.

The vessels operate on the dock principle and each can accommodate six 1,070-dwt Danube Sea-Barges or 12 LASH barges on an open cargo deck. A stern ramp will be used for RO/RO operations. A total of 513 (TEU) containers can be stowed in three tiers.

Combined turnaround time is planned to be 12 hours. A pusher tug will accompany each mother vessel, making loading and unloading operations possible in sheltered waters without entering port.

The main dimensions of the new ships are: length overall, 158.9 meters (about 519 feet); breadth, 31 meters (102 feet); depth to main deck, 5.30 meters (17 feet); depth to upper deck, 15.45 meters (51 feet); draft (loaded), 4.30 meters (14 feet); and draft (submerged) 9.30 meters (31 feet).

Propulsion equipment consists of two me-

dium-speed diesels with a combined output of 7,600 bhp each driving its own propeller. The speed of each vessel will be about 13 knots.

#### CDS Awarded Chestnut Shipping To Retrofit Tanker At Northwest Marine

The Assistant Secretary and the Maritime Subsidy Board have authorized the award of construction-differential subsidy (CDS) for the retrofitting of either of two 89,700-deadweight-ton tankers operated by Chestnut Shipping Co. to meet the requirements of the Port and Tanker safety Act of 1978.

Chestnut Shipping has applied for CDS for the reconstruction of both vessels, the

Chestnut Hill and Kittanning. The Maritime Administration actions permit the company to choose which vessel will be retrofitted under the terms of approvals granted; action was deferred on the award of subsidy for the reconstruction of the second ship.

The work will include installation of inert gas and crude oil washing systems and the replacement of cargo stripping pumps. The work will be performed by Northwest Marine Iron Works, Portland, Ore.

In a previous action the board determined that \$3,930,076 per vessel (including \$308,605 in national defense features) was a fair and reasonable price and set the subsidy rate at 43.66 percent. The amount of subsidy provided for the reconstruction of one ship will be \$1,716,576.




## NAV-COM INTRODUCES THE MX-3102 SATELLITE NAVIGATOR MAGNAVOX QUALITY - COMPETITIVELY PRICED



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### John Manly Shipyard Delivers MTU-Powered Patrol Vessel

RivTow Straits Limited recently delivered the Canadian Fisheries patrol vessel James Sinclair

(shown above), built at the company's John Manly Shipyard in Vancouver, B.C. Built at a cost

of about \$7 million, the new vessel is of all-welded aluminum construction, and features such advanced technology as a Com Dev satellite navigator, Sperry controls (for radar, steering, and gyrocompass), Muirhead weatherfax recorder and printout system, and computerized Decca Isis system for internal mechanical control.

Other electronics include Furuno FD 171 radio direction finder, Com Dev Internav Loran C navigator and investigator, two Sperry radars, Sperry doppler speed log, Wesmar sonar, Simrad depth sounder, two Motorola SSB radios, and two Marconi VHF radios.

Two MTU 12V538TB91 diesel engines, each rated 2,300 bhp at 1,790 rpm, provide main propulsion power. They drive Lips controllable-pitch propellers through Lohman & Stolterfoht reduction gears. Electric power is supplied by three Caterpillar 3406 diesels driving Siemens 460-volt gener-



Mr. and Mrs. James Sinclair stand before fisheries patrol vessel James Sinclair following recent christening. Christened by Mrs. Sinclair, the \$7-million vessel is named after her husband, a former Federal Fisheries minister.

ators. The main engines are fitted with Maxim silencers.

The James Sinclair has an overall length of 124 feet, molded beam of 27 feet 6 inches, and molded depth of 12 feet. She carries 23,000 imperial gallons of fuel and 1,000 gallons of potable water. The vessel attained a trial speed of 16½ knots, but normal cruising speed is 12 knots.

Deck gear includes a Harrison & Robbins anchor windlass and capstan, Sperry steering gear, Washington Anchor anchors, Atlas crane, Beaufort Canada lifeboats, Zodiac lifeboats and boarding boats, and John Manly closures. Deck covering was supplied by Raeco Western, and paint by International Marine Coatings.

The new vessel, named after former Federal Fisheries minister James Sinclair and christened by his wife, Kathleen, will patrol Canada's 200-mile territorial limit and will enforce Federal Fisheries regulations. She will be the largest fisheries patrol vessel on Canada's West Coast, and replaces The Howay.

RivTow spokesman David Leith said that the Sinclair is the largest aluminum vessel built by the company. "This is quite unusual for a vessel of this size," said Mr. Leith, commenting on the aluminum construction. "They usually are made of steel but in this case they were looking for speed."

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Location: St. Catharines, Ontario



2 Landing Craft, M.V. Remy, built 1943. Powered by two G.M. Diesels, 175 H.P., 52" long, 14' wide, 4'6" draft, c/w McDougall Water Pump with Briggs and Stratton Engine, 4 cycle, 1 cylinder, 3 H.P.  
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Canada

shares of Twin City Barge's common stock for the outstanding common stock of Transload and Transport, Inc. and its affiliated companies.

Transload and Transport, Inc., which is privately held, operates liquid tank barges on the Gulf Intracoastal Waterway system and the Lower Mississippi River. Its principals, **Wayne Musgrove** and **Kenneth Dunagin**, will continue to direct Transload and Transport, Inc. operations as one of Twin City Barge's wholly owned subsidiaries.

"The acquisition of Transload and Transport, Inc.," Mr. Lambert said, "will give Twin City Barge a base of operations on the Lower Mississippi River, and will provide Twin City Barge with a significant diversification into the liquid tank barge business." Mr. Lambert added that "the merger is a natural progression of events since the two companies have been involved in several joint ventures during the past few years."

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

#### Cuzco Asks Title XI For Aluminum Catamaran Diving Support Vessel

Cuzco, Inc., a subsidiary of Underwater Completion Team, Inc., Curtis Lane, New Iberia, La., has applied for a Title XI guarantee to aid in financing the construction of an aluminum catamaran diving tender/support vessel.

The 124-foot vessel will be powered by four diesel engines each rated at 626 shaft horsepower. It is expected to operate in the Gulf of Mexico.

If approved, the Title XI guarantee would cover \$4,400,000 or approximately 87½ percent of the estimated actual cost of \$5,033,756.

Underwater Completion Team is also the proposed builder of the vessel which is to be delivered in September.

#### 34 Ways For Tugs To Assist Tanker—Test Results Available

Tests were conducted in Puget Sound to examine possible ways in which tugboats could assist a supertanker which had lost its power, ability to steer, or both. The 188,500-deadweight-ton tanker B.T. San Diego, chartered from Shell Oil Co., and three tugboats

from the Foss Launch and Tug Co. were used in 34 maneuvers.

The Maritime Administration has released a report defining the test and program, and containing measurements of its results. The tests were jointly sponsored by MarAd, the U.S. Coast Guard, and the American Institute of Merchant Shipping.

The report does not analyze the data, but attempts to present it in a format suitable for analysis by others. It does present "rudi-

mentary conclusions" about the test results.

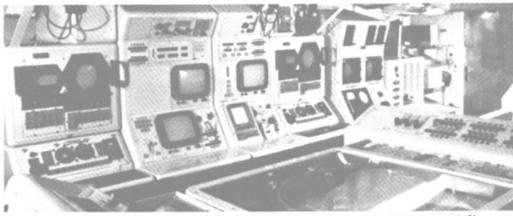
For example, it suggests that, in general, the most versatile position for a single tug used to assist a disabled tanker is along the after quarter of the ship. A single tug also could be used effectively as a "rudder" on the ship's stern, it found. But the least versatile techniques were those which utilized long hawsers.

The report notes that the tests

were performed in mild water or low sea states.

Prepared by Hydronautics, Inc., the single-volume report contains 311 pages of text and illustrations, plus four appendixes. "Full-Scale Trials to Examine Tugboat Utilization in the Control of Large Tankers" is available through the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161. The order number is PB 81-215816, and the price, \$30.50.

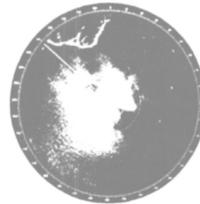
## Some clear thinking on why the navies of ninety countries rely on Decca electronics.



Operations room of the new Brazilian frigate 'Niteroi', with Decca special displays and EW console.



U.S. built Halper Marine patrol boat for the Guatemala Navy, fitted with Decca radar.



Radar picture before and after improvement by Decca Clearscan videoprocessing.

Decca has been selling and servicing marine electronics for a very long time.

Take radar for instance. Since 1950, we've sold more than 90,000 units, approximately one third of the world total. Which is one example of how, when it comes to marine electronics, we really know what we're doing. And we must be doing it really well.

In fact, Decca sets very high standards for quality and reliability in every piece of equipment. And we support our high standards with spare parts and service whenever you need them and wherever in the world you happen to be. We will continue to support your equipment for years to come. That's the kind of long-term investment in quality and service that

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## ON THE COVER



### First Of A New Hybrid Line From Halter

A new breed of tough, versatile offshore tugs has been introduced to the maritime industry by Halter Marine, Inc. and Otto Candies, Inc. The first of the new line, and the first of six to be built by Halter for Candies, the Brett Candies (shown above) is a 105-foot, raised forecastle tug that is a hybrid combining the best features of a tug and tug/supply vessel.

"She is now at work in the Gulf of Mexico running anchors and towing barges with ease," said Paul Candies, operations vice president of the Candies company. "We think she's the most capable boat in the Gulf because of her size and engineering," he added.

Of unique design, the Brett Candies's large aft deck can accommodate cargo as well as buoys and anchors hauled up on the oversized stern roller. Stern gates facilitate the tug's anchor handling.

"Candies wanted a stout, husky tug that could handle the jobs of much larger tugs, but more efficiently," explained Harold P. Halter, president of New Orleans-based Halter Marine. "We gave her the lines of a big tug scaled to 105 feet; that's why she looks larger than she really is," he continued.

Mr. Halter added, "The Brett Candies is a good example of how Halter Marine's in-house staff of naval architects and marine engineers can react quickly and accurately to the industry's changing requirements while meeting Coast

Guard tow line and stability criteria."

The Brett Candies has a beam of 34 feet and a depth of 17 feet, and is certified under 100 gross tons. Some of her capacities are: 99,000 gallons of fuel oil; 1,600 gallons of lube oil; and 9,700 gallons of potable water. The unusual aft deck has 1,054 square feet of clear cargo space.

She is powered by two GM Electro-Motive Division 12-645E6 diesel engines developing a total of 3,000 bhp at 900 rpm, which were rebuilt at Otto Candies's Des Allemands, La., facility. Bollard pull through her Markey towing winch is approximately 35 tons. Reverse/reduction gears are Reintjes WAV1850 with 5:1 ratio. Mounted on the 10-inch-diameter shafts are two stainless steel, four-bladed 117-inch by 88-inch propellers.

Providing electric service on the Brett Candies are two 75-kw generators driven by GM Detroit Diesel 6-71 engines. Compressed air is from two Quincy D325 compressors. Spacious accommodations have been provided for up to nine crewmen for extra comfort on extended voyages or jobs.

The Brett Candies is American Bureau of Shipping classed +A-1, Full Ocean Towing, AMS, Ice Class "C". She is also U.S. Public Health Service approved.

The vessel was built by Halter's Lockport, La., division, one of a group of shipyards owned and operated by Halter Marine in the Southeastern United States.

### SNAME Chesapeake Section Hears Landing Craft And Steering Gear Papers

The final meeting of the 1980-81 season was held by the Chesapeake Section, The Society of Naval Architects and Marine Engineers, at Quality Inn/Colony 7, Laurel, Md.

The technical session was devoted to two papers: "Design of a 35-Knot Planing-Type Landing Craft," by Mark Griffin and Tom Sherman, members of Virginia Tech Student Section, SNAME, from the Department of Aerospace and Ocean Engineering, Virginia Polytechnic Institute and State University, Blacksburg, Va.; and "Steering Gear Requirements—Changes on the International and Domestic Scene," by Comdr. John C. Maxham, U.S. Coast Guard.

Introduced by Allen H. Magnuson, Ph.D., Associate Professor, Department of Aerospace and Ocean Engineering, VPI, the students alternated in the presentation of their paper and the fielding of questions at the end of their talk.

Design of a high-speed landing craft with a large payload capability was discussed. Five modes of operation were addressed: namely, well deck, alongside ship, transit, surf and beach. Two initial hull shapes were compared by model tests: one with a modified cathedral hull and one with a catamaran hull with the latter configuration selected as the better of the two. Gas turbines, as prime movers operating through screw propellers and waterjet propulsion systems were described. Structural analyses, designed to yield a midship section with adequate strength to withstand severe slamming loads, were outlined. Structural subsystems were included and a cost estimate provided to complete the design.

Commander Maxham in his paper on effective steering gear requirements pointed out that effective steering gear operation is vital to the safety of ships, personnel, and the marine environment. Recent major casualties, involving steering gear failures, have resulted in the devotion of considerable effort directed to-

ward improvement in national and international steering gear standards, particularly for tankers. The Inter-Governmental Maritime Consultative Organization has been instrumental in the production of amendments to the 1974 SOLAS Convention affecting steering gear requirements. Basic Coast Guard and international requirements were presented and discussed for steering gear. Changes, resulting from such agreements as Resolution A.325 (IX), the Tanker Safety and Pollution Prevention Conference and aforementioned amendments to SOLAR 74, were outlined and indicated as being ready for adoption during the 12th IMCO Assembly in November 1981. U.S. and international requirements for steering gear were compared and a probable timetable for implementing the new requirements were presented.

Commander Henn, acting for Captain Brown of the Coast Guard, and Ralph Johnson, National Transportation Safety Board, gave prepared discussions of the paper followed by several discussions from the floor, including one by Gordon Sims, chairman of the MBE Group, IMCO.

Prior to the technical meeting, Dr. James Lisnyk, past chairman of the SNAME Chesapeake Section, placed in nomination the following names for the 1981-82 Chesapeake Section Executive Committee: chairman, Fred Slyker, Bethlehem Steel Corporation (Sparrows Point); vice chairman, Capt. Richard Gauthey, Naval Sea Systems Command; secretary-treasurer, Alex Landsburg, Maritime Administration; Elected Member, Ralph Johnson, National Transportation Safety Board.

There being no nominations from the floor, the slate as presented was elected unanimously.

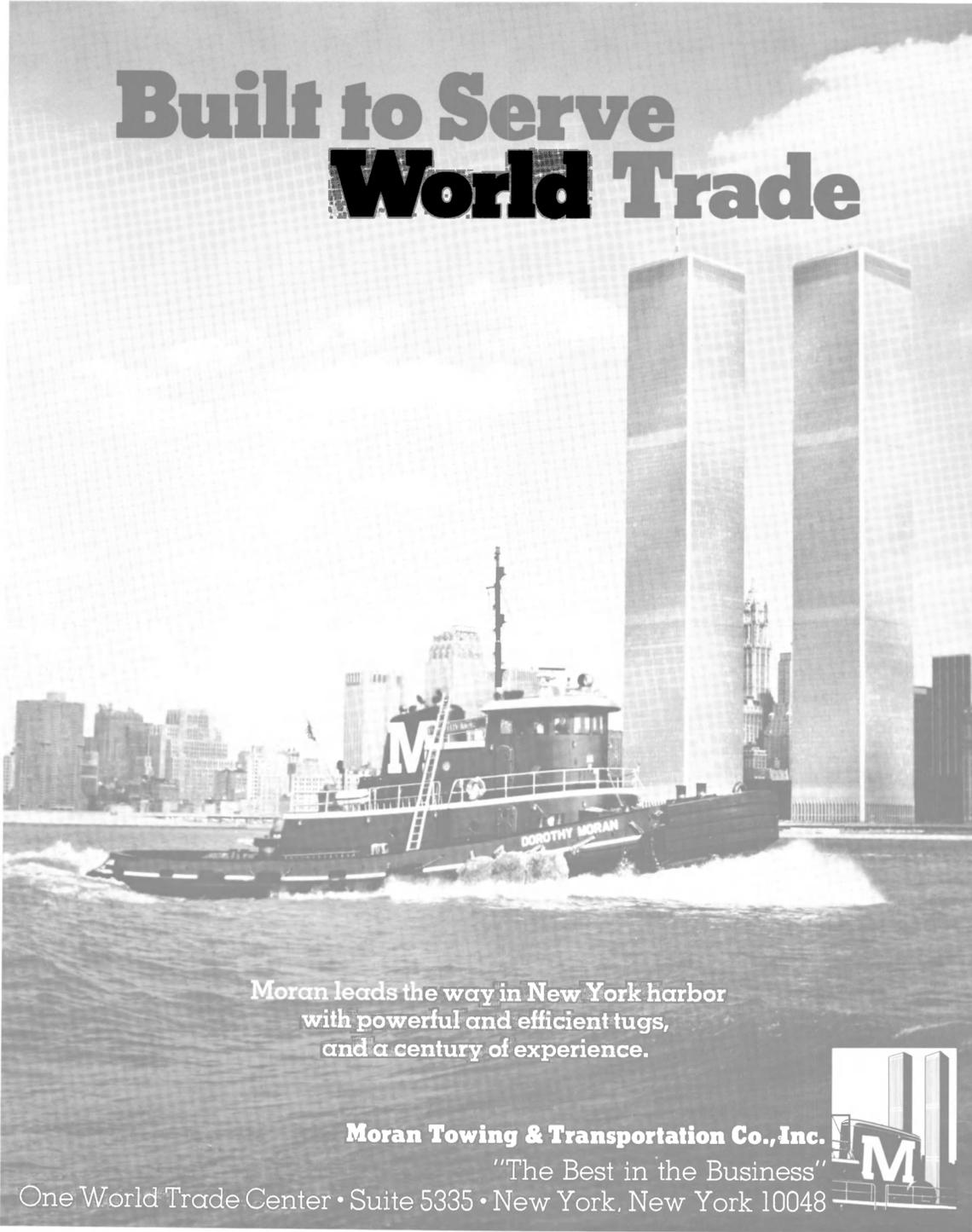
Outgoing chairman Robert Scott was presented with a Certificate for Outstanding Service by Frank Slyker, both of whom are to be commended for their joint efforts in organizing the SNAME Baltimore Subsection of the Chesapeake Section.



Shown, left to right, at the Chesapeake Section meeting are: Allen H. Magnuson, Virginia Polytechnic Institute and State University (VPI); Mark Griffin, VPI, author; Tom Sherman, VPI, author; Comdr. John C. Maxham, USCG, U.S. Coast Guard Headquarters, author; Frank Slyker, Bethlehem Steel Corporation, Sparrows Point, vice chairman, Chesapeake Section, SNAME; and Robert J. Scott, Gibbs & Cox, Inc., chairman, Chesapeake Section, SNAME.

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**\$326-Million Order  
For 8 Rigs Awarded To  
Marathon Manufacturing**

The Penn Central Corporation's Marathon Manufacturing Company has signed \$326 million in contracts with the Rowan Companies, Inc. for the construction of eight offshore oil and gas mobile drilling rigs. Marathon's marine construction order backlog

now totals 43 rigs, valued at approximately \$900 million.

Included in the eight units for Rowan are two Marathon "Gorilla" jackup rigs designed for hostile environments.

Richard Dicker, chairman and chief executive officer of Penn Central, said: "Because of the continued strong demand for offshore rigs, we expect Marathon to set a record year in 1981."

Marathon has six additional

orders for offshore drilling rigs in various stages of negotiation preparatory to final contract signing. It is expected that these contracts will be signed during the third quarter of 1981.

The first rig is scheduled for delivery to Rowan in September 1983 from Marathon's Singapore yard, with the last to be delivered in December 1985 from its Vicksburg, Miss., yard. The first Gorilla rig will be delivered in December

1983 from its Vicksburg yard, and the second Gorilla rig is scheduled for delivery from its Singapore yard in December 1984. Rowan's commitment to purchase these rigs has been generally known in the industry for some time.

Marathon's rig construction yards are located in Brownsville, Texas, Vicksburg, Miss., and the Republic of Singapore. Marathon's offshore drilling rigs are also constructed by three licensee yards: Davie Shipbuilding Limited, Lauzon, Quebec, Canada; Euroasia Shipyard Company Limited, Hong Kong; and U.I.E. Shipbuilding (Scotland) Limited, Clydebank, Scotland.

Marathon Manufacturing Company is one of the world's leading producers of mobile, offshore jack-up drilling rigs; a manufacturer of materials handling equipment, electromechanical drive units and other energy-related products; and provides engineering services.

**HAC Names Lauth VP  
Technical And Nautical**

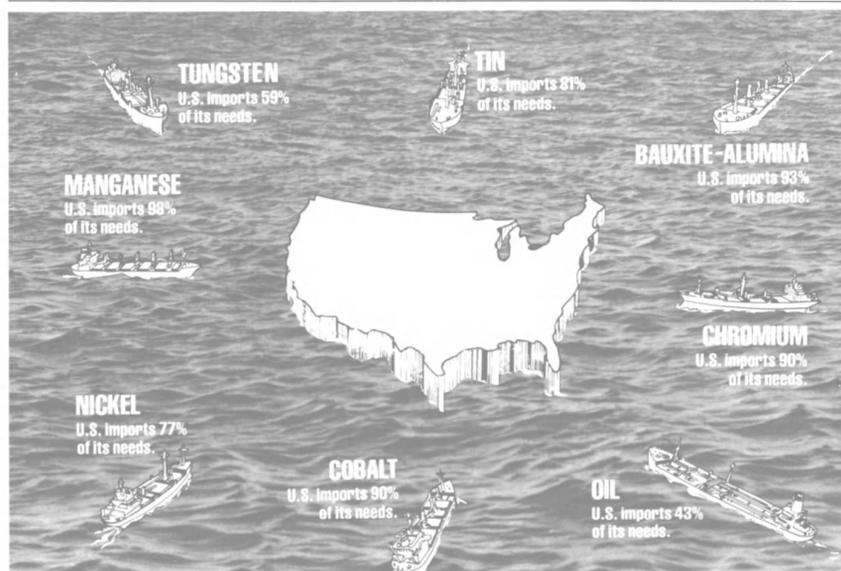


David F. Lauth

Holland America Cruises has appointed David F. Lauth vice president of Technical/Nautical Operations. In this new senior management position, Mr. Lauth will be responsible for the strategic planning and analysis of Holland America's technical and nautical needs as well as the coordination of technical and nautical operations with other divisions within the company.

Mr. Lauth, a rear admiral with 31 years of service in the U.S. Coast Guard, enjoys a national reputation as an outstanding manager, having had the responsibility of directing the activities of over 1,400 military and civilian personnel in Hawaii, Guam, Japan, American Samoa and other locations in the Pacific Basin. During his Coast Guard career, Mr. Lauth worked to implement the National Safety Program for recreational boating. As Deputy Director for the U.S. Coast Guard he set policy for personnel administration on boating safety, and had active command of several Coast Guard vessels.

Mr. Lauth holds a degree in engineering from the U.S. Coast Guard Academy and a master's degree in public administration from the University of Pittsburgh.



**HOW WILL WE KEEP THIS ISLAND  
FUNCTIONING WITHOUT SHIPS?**

Freedom of the seas has always been crucial to strong nations. For the U.S., which is the largest trading nation in the world and largely dependent on foreign sources for many strategic raw materials, safe and open sea lanes are essential to national security and economic well being. Any curtailment would have dire economic consequences.

Yet while the Soviet Union has been building its Navy to a point where it outnumbers our own, the U.S. has been going in the opposite direction. In the words of the U.S. Chief of Naval Operations, Admiral Thomas B. Hayward, "We are trying to meet a three-ocean requirement with a one-and-a-half-ocean Navy." And on the basis of current budget requests, the Navy's combatant strength will actually decline so that by the 1990s our defensive capability may be inadequate and our trade routes vulnerable.

The U.S. merchant marine fleet, too, is ill-prepared for a global mission. And the men and women skilled in building new ships and repairing those in our existing

fleets to keep them on station are being laid off for lack of work. If this erosion continues, we will not have an adequate shipbuilding mobilization base to rely on in any future crisis.

Ships are indispensable for commerce... for peace... for defense... for the public good. U.S. ships must be built within our own borders, at our own facilities, by our own people, under our own control. We cannot rely on foreign governments, however friendly today, to come to our aid with their ships and crews during tomorrow's emergency.

Our nation urgently needs a firm decision in Washington now — by Congress and the Administration — to reverse the trend of declining maritime strength by funding a U.S. merchant and naval fleet of global dimension and capability, sufficient in numbers and deterrent potential to preclude any threat of economic strangulation.

As an island nation, we can't afford to wait any longer.



Despite the proven cost effectiveness and operational flexibility of the guided missile frigate (FFG), present government procurement plans call for only 54 of these sophisticated new warships instead of the 73 originally planned.



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**DELIVERING THE SHIPS THE U.S. NEEDS  
WHEN IT NEEDS THEM.**

**Rear Adm. Lisanby Named Principal Deputy NAVSEA Commander For Acquisition**

Rear Adm. James Lisanby, USN, former Deputy Commander for Ship Design & Integration, Naval Sea Systems Command, has succeeded Rear Adm. Edward J. Otth, USN, as Principal Deputy NAVSEA Commander for Acquisition. Admiral Otth retired recently.

**McDermott Scotland Is Awarded \$150 Million In Offshore Contracts**

McDermott Scotland, a division of McDermott International, Inc., the major overseas marine construction subsidiary of McDermott Incorporated, has recently been awarded three contracts with a total value of more than \$150 million.

These contracts call for:

- Fabrication of the 15,000-metric-ton topside facilities for Conoco U.K. Ltd.'s Hutton Project, the world's first tension-leg platform. McDermott has already fabricated the subsea drilling template for this project. Tension leg platforms are floating platforms tethered to the seafloor. Their use opens opportunities for developing petroleum reserves in extremely deep waters, reserves that had been technically impossible or uneconomical to develop using conventional means. The contract is scheduled to be completed in the spring of 1983.

- Fabrication of the 1,500-metric-ton power generation module for Marathon Oil U.K. Ltd.'s Brae Field platform. The module will contain four electrical generating units with an output of 20 megawatts per unit and their controls. Completion is scheduled for April 1982. McDermott Scotland is also fabricating the 21,000-metric-ton jacket and 36 piles with 84-inch diameters for the Brae Field platform.

- Fabrication of 5,000 metric tons of piling for Mobil North Sea Ltd.'s Beryl "B" platform. McDermott Scotland is fabricating 36 piles 72 inches in diameter, which are scheduled to be completed by the spring of 1983.

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

**International Paint Enters Korean Coatings Market**

International Paint Company, with U.S. headquarters in Union, N.J., and manufacturing centers in New Orleans and San Francisco, recently entered a joint

venture with the Seoul, Korea-based Daihan Ink & Paint Company. The merger is now registered as International Paint (Korea) Ltd.

The venture was formed in order to effectively service Korea's large and growing market for heavy-duty paints, particularly those designated for marine new-buildings, repair and maintenance, and freight containers.

International Paint (Korea) Ltd. is currently producing a wide spectrum of marine and other heavy-duty coatings. Although Korea is one of the world's major container manufacturing, shipbuilding, and drydocking centers, local paint manufacturers have rarely offered products meeting worldwide specification and technical standards.

The formation of International

Paint (Korea) Ltd., now makes it possible for all International Paint customers—with shipbuilding, drydocking, and container manufacturing operations — to specify and obtain uniform product quality coupled with expert technical service guidance. This is the same high level product and service offered to International Paint customers throughout the world.

**Which VHF radio thinks, points, talks and has never been duplicated?**



**There is only one.**

The Regency Polaris NC7200. There's nothing else like it. And there may never be.

You see, we own a 47 page patent on this radio, which means we can offer you some very unique advantages. For example, what VHF transceiver is smart enough to guide you into port on a stormy night, navigate to another ship, or help you set a course just by using weather stations, coastal stations or marine operators? Only one.

Next consider how many VHF radios offer you computer control with three separate operating



memories, all the VHF channels, a scanning receiver, four weather channels plus priority—yet are actually easy to use. Just one.

Now here's the icing on the cake. Which VHF radio was voted number one in its class for performance and reliability by the nation's marine electronics dealers (and that includes the guys who sell competitor's products) after just one year on the market? Still only one.



It's called the Regency Polaris NC7200. We make it in America. We're very proud of it. And it can be yours for \$1395\*.

\*Manufacturer's suggested retail price.

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**W.J. Magratten Joins  
TOOLTECH As VP,  
Marketing/Development**

TOOLTECH INC., Minneapolis, Minn., international manufacturer of rotary drill pipe and tool-joints used in oil, gas, water and mineral drilling, has announced the appointment of William J. Magratten to the new position of vice president-Marketing and Business Development.

Mr. Magratten comes to the position from AMCA International Corporation where he held a variety of marketing management positions associated with equipment related to the energy industry, i.e., Clyde, Offshore Whirley Cranes and Winches, Dominion/Morgan Pumping units, and Wiley drilling barges.

TOOLTECH INC. is a subsidiary of NORTEK INC.



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can meet your demands.**

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650 foot side launch-ways and 200 ton crane, plus a staff of experts who custom build with pride have made us a leader in quality steel fabrication for over six decades.

We tackle jobs beyond the reach of other steel fabricators because

we're better equipped. And that's just part of your insurance of getting a better product.

For your next job, whatever the size, look to FMC. Demand the best. After all, we demand it of ourselves. Call or write Vice President of Sales, FMC Corporation, Marine and Rail Equipment Division, 4700 N.W. Front Avenue, Portland, Oregon 97208. Telephone (503) 228-9281; Telex 36 0672; Telecopy (503) 223-5036.



The 225-foot seiner Chiriqui II splashes into the water of Sturgeon Bay. She will depart the Great Lakes this fall and make trip to Panama via St. Lawrence Seaway.

**Two Tuna Seiners Christened  
At Peterson Builders Yard**

The twin superseiners Sea Chase and Chiriqui II were christened recently at Peterson Builders in Sturgeon Bay, Wis. The Sea Chase, launched last December, departed Sturgeon Bay at the end of July under command of Capt. Gregory Chase, whose wife, Renee, christened the boat. The Chiriqui II, skippered by Capt. Joe Gois of San Diego, was christened by his wife, Clara and then splashed into Sturgeon Bay in a spectacular side launch.

The Sea Chase is owned by Pesquera San Blas, S.A., of San Juan, Puerto Rico; the Chiriqui II by Pesquera San Carlos, S.A. of Panama. Both boats will be managed by Tuna Fleet Management, Inc., San Diego, of which Robert A. Grant is president. Remarks were given by James DeSilva, founder of Tuna Fleet Management. Keynote address at the christening of the Sea Chase was given by Mr. Mizushima, vice president of Mitsui & Company Inc. (USA); and David Colburn, vice president of Continental Bank, Chicago, gave the keynote address at the christening of the Chiriqui II. Ellsworth Peterson, president of Peterson Builders, was the master of ceremonies.

Both boats have identical specifications and equipment, and represent a continuation of Peterson's very popular series of 1,200-ton seiners. They are 225 feet long, 41 feet wide, 19 feet deep and draw 17 feet 8 inches in design full load trim. They pack their catch in 17 wells frozen by a Vilter ammonia refrigeration system, and accommodate a crew of 22 in luxurious and beautifully appointed quarters. Main propul-



Capt. Joe Gois stands proudly in front of his new tuna seiner Chiriqui II just after she was launched at Peterson Builders. With him are his wife, Clara, sponsor of the vessel, daughter Stephanie and son Jose.

sion machinery is a single 20-cylinder GM Electro-Motive Division diesel, rated 3,600 bhp at 900 rpm and driving a five-blade, 128-inch-diameter Coolidge stainless-steel wheel through a Falk 5:1 reduction/reverse gear.

Auxiliary machinery includes three Caterpillar D353E diesel engines driving Kato 300-kw generators; a Caterpillar D3412 hydraulic system prime mover, rated 520 horsepower and a Caterpillar 3406 engine rated 400 horsepower driving a 50-inch Michigan Jastram bow thruster through a Twin Disc 1.5:1 reverse/reduction gear. Mathers pneumatic controls are provided for both main propulsion and bow thruster systems, and the bow thruster is interfaced with the Sperry gyropilot to af-



Principals in christening of the Sea Chase included (from left) Mrs. Frank Chase; her son Capt. Gregory Chase; Mrs. Renee Chase, sponsor; Frank Chase, Captain Chase's father, and Travis and Desiree Chase, Captain and Mrs. Chase's children.

ford automatic heading keeping while holding on station. The main switchboard is by Federal Pacific Electric.

The fish wells are filled using a Morris Whaley Inc. hydraulic fish conveyor. Frozen fish is floated to the tops of the wells and is placed on the conveyor where it can be directed forward and aft for unloading.

Deck machinery includes a Marco 560-inch power block, Marco WS454 Superseine winch; numerous Gearmatic winches, two Husky hydraulic cranes, two Peterson speedboat davits, and a Morris Whaley ring stripper. New Morris Whaley electrohydraulic brailing winches are also fitted.

The electronics complement is unusually thorough and includes two Furuno FR711 radars with a RDI radar watch; Krupp-Atlas model 950 scanning sonar with CRT display; two Morrow AM single-sideband radios; one CAI 1-kw single-sideband radio; two Intech Mariner 90 VHF/FM radios; King KY197 aircraft radio, President CB; Bearcat scanners, Navidyne satellite navigator; Baymar recording depth sounder and impulse digital depth alarm. A 15-station telephone system, television / VCR / AM-FM entertainment system, and 300-watt public address system (to which the telephones and entertainment system are interfaced) was engineered and provided by Honor Marine Communications of San Diego.

Both vessels will carry Hughes 500 turbine-powered helicopters, and special attention has been given to the efficient operation and maintenance of the aircraft. Peterson engineers designed specific facilities including helicopter landing pad, tie-down apparatus, service shop, spare blade stowage racks, and fuel management systems to facilitate and enhance the safety of shipboard helicopter operations.

#### French Group Purchases Marine Structure Firm

Ownership of EMH (Entreprise d'Equipements Mecaniques et Hydrauliques), Paris, a well-known builder of offshore structures for the oil and gas industry, has been acquired by a three-company French group.

According to Jean Alleaume, EMH president, Spie-Batignoles,

SOFRESID, and ETPM have purchased his firm from CFEM (Compagnie Francaise d'Entreprise Metallique). Terms of the purchase were not disclosed.

EMH is noted in the marine industry for its pioneering work in the development of the articulated deepwater column. These satellites of oil-production platforms offshore are used for the transfer of crude oil from well to waiting

tankers. Also, they are used to flare gas from production facilities. EMH currently is constructing an articulated column that will serve as remote control center for a subsea well in the Northeast Frigg field.

Mr. Alleaume described EMH's condition as "very sound," and indicated that the company had eight contracts in house. These include three articulated columns

for Phillips Petroleum, Mobil Oil, and Elf Aquitaine Norge; a yard-built fixed column for installation in coastal waters off Central America for PEMEX; two floating-buoy (CALM) tanker-loading facilities for Total Abu Al Khoosh off Abu Dhabi and for Elf Italiana in the Rospo Mare field; and two tanker-loading facilities for Panama Pipeline Terminal Company.

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These cleanings have reduced fuel costs and improved performance for virtually every type of ship... tankers, LNG's, bulk carriers, freighters, and naval vessels.

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Cleaning costs vary with vessel size, degree of fouling, and operation. On the average, a \$10,000 cleaning will generate about \$100,000 in fuel savings. Over all, a 1,000% return on investment is not unusual.

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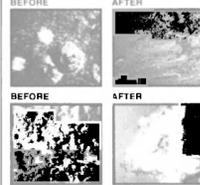
SCAMP Underwater Hull Cleaning machines are proven performers for conventional

**TYPICAL NET SAVINGS WITH REGULAR SCAMP UNDERWATER HULL CLEANINGS OVER A 24-MONTH DRY DOCK CYCLE FOR 21, 50, and 250 KDW TANKERS.**  
(Net savings at 12 knot constant speed)

Fuel Costs (\$/Ton)	21 KDW	50 KDW	250 KDW
\$275	\$129,000	\$575,000	\$690,000
250	117,000	523,000	627,000
225	105,000	471,000	564,000
200	94,000	418,000	502,000
175	82,000	365,000	439,000

Net savings over 24 months represents total fuel savings less cost for SCAMP underwater hull cleaning and 4 to 16 hour cleaning periods

anti-fouling coatings, for reactivation coatings and for newer sophisticated self-polishing coatings. In fact, SCAMP Underwater Hull Cleaning machines have been used successfully when self-polishing coatings have become fouled due to vessel idling.



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SCAMP Underwater hull cleaning stations are strategically located on the major trade routes. Cleaning rates will be furnished for each vessel upon receipt of hull specifications. The time required for cleaning ranges from 4 to 16 hours, depending upon the size of the vessel, areas fouled, degree of fouling, etc.

Machines are hoisted in and out of the water by an accompanying workboat which supplies the operating power. No action is required of the vessel being cleaned. In most cases, this operation can be conducted during the vessel

loading or unloading. SCAMP Underwater Hull Cleaning Machines are approved for use at oil tanker terminals. Their operation has no lasting impact on harbor or estuary waters.

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Bookings can be easily arranged to accommodate ships' schedules by contacting Butterworth Systems, any Butterworth Systems Sales Representative or SCAMP underwater hull cleaning station. For more information write or call.



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Telex: 9420

**ITALY-GENOVA AND OTHER PORTS**  
Guanito Barbozelata, Genova  
Telex: 270087 GUANI

**SINGAPORE**  
Underwater Maintenance Pte. Ltd.  
Telex: NEMWMOON RS 21514,  
SINGAPORE

**JAPAN - TOKYO/KIIRI/KOBE**  
Marine Engineering Corp., Tokyo  
Telex: 02322439 MAC-LIN J

**ROTTERDAM (Netherlands)**  
Underwater Cleaning & Diving  
Rotterdam BV  
Telex: 23339 - Rotterdam, Netherlands

**CANARY ISLANDS - TENERIFE/LAS PALMAS**  
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Telex: 92241 RSUBE, Santa Cruz de Tenerife

**SUEZ CANAL - PORT SAID BITTERLAKES/PORT SUEZ**  
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Seaward Marine Services  
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SEACLEAN NTCY  
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**THE GULF**  
HydroSpace International, Dubai, UAE  
Telex: 47455 HYDRO EM

## Mid-Coast Marine Yard Delivers Its First Twin-Screw Tugboat

Mid-Coast Marine, Inc. (formerly Nelson Log Barge) of Coos Bay, Ore., recently delivered its first 65-foot, twin-screw tugboat, the Andy Head (shown right), to Alaska Timber Corporation. The new vessel will perform towing and ship-handling jobs for the ATC plant in Klawock, Alaska.

Designed by Jack Wilskey to meet American Bureau of Shipping and U.S. Coast Guard standards for structural strength and stability, the tug has a beam of 23 feet 10 inches and draft of 9 feet. The entire vessel is protected by extruded rubber "D" section fenders, plus extra protection on the bow to assist in the ship-docking process.

Main propulsion is provided by two Cummins KT2300M V-12 diesel engines equipped with air starting, driving 68-inch-diameter, four-bladed Coolidge propellers in Mid-Coast Marine nozzles through Twin Disc MG530, 6:1 reverse/reduction gears. Keel cooling for the main engines is provided by Fernstrum units. Free-running speed on trials was 11 knots. The vessel has fuel capacity of 12,400 gallons and carries 3,000 gallons of fresh water. Power and maneuverability in a small package are the prime characteristics of this heavy-duty workboat.

Engine and steering controls are provided at three locations. Full follow-up hydraulic steering is installed, in association with a Sperry MK8 autopilot system. Mathers air-operated engine controls are provided at the same locations — port and starboard in the pilothouse and at the aft tow winch station.

Electric power for the various engine room pumps and heating system is provided by two Lima 30-kw ac generators, driven at 1,200 rpm by GM Detroit Diesel Allison model 3-71 engines. A 12-volt battery starting system is provided for the auxiliaries, as well as for emergency lighting and radio power. Staterooms for four crew members are located in the forecabin.



Staterooms for four crew members are located in the forecabin.



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the captain's stateroom is on the main deck. A spacious galley/dinette area on the port side of the main deck is fitted with electric range, refrigerator, and freezer. A Microphor model M-30 marine sanitation system is installed to meet USCG regulations for effluent discharge.

The Andy Head is named after the grandson of Edward E. Head, founder and president of Alaska Timber Corporation.

#### Ocean Barge Receives Title XI Approval On \$18.5-Million Barge

The Maritime Administration has approved in principle an application from Ocean Barge Corp., No. 2 Canal Street, New Orleans, La., for a Title XI guarantee to aid in financing the construction of an oceangoing dry cargo barge. The 550-foot, 33,000-dwt barge is intended for operation in domestic coastwise coal carriage, but may be used initially in preference grain trades.

Bay Shipbuilding Corp., Sturgeon Bay, Wis., was selected to build the barge. Delivery is expected in November.

The approved guarantee is for a maximum of \$16,257,000, which is 87½ percent of the barge's estimated actual cost of \$18,580,000.

#### 44-Page Chevron Marine Lubricants World Port Directory Available

Chevron International Oil Company, San Francisco, Calif., has published a 44-page Marine Lubricants World Port Directory.

The Directory lists in tabular form by country, the location, supplying company, stock availability, and bulk delivery capability of Chevron's marine lubricants. Information on submitting test samples and ordering procedures is also included.

For a free copy of the Chevron Marine Lubricants World Port Directory,

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#### Jos. L. Meyer Shipyard Delivers LPG Carrier Dorothea Schulte



The liquid gas carrier Dorothea Schulte (shown above) was delivered recently to the Hamburg shipping company Bernhard Schulte by the Jos. L. Meyer shipyard in Papenburg-Ems, Federal Republic of Germany. The

new vessel is the eighth gas tanker to join the Schulte fleet, and is a sister ship of the Hermann Schulte, delivered by the Meyer yard in December 1980 to the same shipping company.

The orderbook of Jos. L. Meyer now includes two more sister ships of the 6,095-dwt Dorothea Schulte, as well as two LPG carriers of 6,400 cubic meters capacity each, and two liquid gas tankers of 15,000 cubic meters cargo capacity for German own-

ers. Delivery of these ships is scheduled between the end of 1981 and the beginning of 1983.

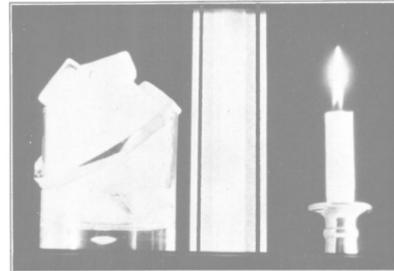
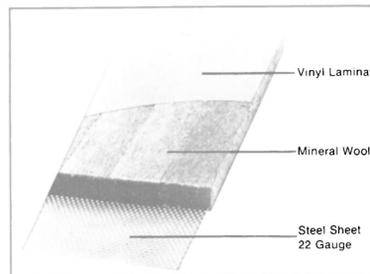
The Dorothea Schulte has been built according to the regulations and under the supervision of Germanischer Lloyd for the classification +100A 4E Liquid Gas Carrier type II G, +MCE AUT 16/24. An IMCO certificate will be issued for the ship according to the chemical code for certain cargoes.

The new ship has an overall

length of 363.8 feet, beam of 50.8 feet, depth of 35.4 feet, and draft of 24.7 feet. Total capacity of her cargo tanks is 5,647 cubic meters.

The main propulsion engine is a B&W type 6L45GFCA diesel with a maximum continuous rating of 5,910 bhp at 175 rpm. It will be operated to provide an output of 5,400 bhp at 171 rpm, giving the ship a service speed fully loaded of 14.2 knots. Maneuverability of the ship is enhanced by a 400-hp bow thruster.

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However, the cost-effectiveness doesn't stop with the reduced manhours. ISOLAMIN systems are

also fully insulated, eliminating the need (and the cost) for any extra insulation. And the steel sheeting which covers the panels eliminates the risk of broken corners — even if the material is handled carelessly.

ISOLAMIN panels are approved by the U.S.C.G. and 16 international classification agencies. And the range of colors, patterns, and material finishes make ISOLAMIN accommodations as attractive as they are sound.

When you need to build the best in marine accommodations, easily and cost effectively, specify ISOLAMIN — because, *at sea, second best won't do*. For more information about how ISOLAMIN can best serve your requirements, please write or call:

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**\$13-Million In Title XI Guarantees Sought For 50 Hopper Barges**

Three limited partnerships located at 2701 Houma Boulevard, Metairie, La., have applied for Title XI guarantees to aid in financing a total of 50 hopper barges. All are to be 200 feet long, and are intended for operation in

the Mississippi River. The applicants are:

Commercial Barge Carrier Limited Partnership I, which requested a guarantee of \$5,359,000 for 20 barges it proposes to have built by Equitable Shipyards, Inc. of Metairie;

Commercial Barge Line Limited Partnership I, which requested a guarantee of \$2,680,000 for 10 barges, with Equitable also listed as the proposed builder; and

Commercial Barge Transport Limited Partnership I, which requested a guarantee of \$4,998,000 for 20 barges, with Jeffboat, Inc., Jeffersonville, Ind., the proposed builder.

In each case, the requested guarantee is for up to 87 1/2 percent of the estimated actual cost of the vessels. All would be scheduled for delivery by the end of the year.

**Du Pont Offers Brochure On Planned Corrosion Control Program**

According to a new, color brochure from the Du Pont Company's marine finishes group, a carefully planned program of marine maintenance painting coupled with high-performance finishing systems can save shipowners time, trouble and money in the long run.

Entitled "Innovations In Corrosion Control with Du Pont Marine Finishes," the brochure is the result of long experience in preventing corrosion at more than 100 Du Pont chemical plants and with the company's large fleet of inland and oceangoing ships and barges. The company has been active in the marine maintenance painting field for more than 40 years.

The brochure contains information on Du Pont high-performance finishes such as "Imron" polyurethane enamels, "Ganicin" zinc-rich primers, and "Corlar" two-component epoxy enamels.

For a free copy of "Innovations In Corrosion Control with Du Pont Marine Finishes,"

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**W.R. Martyn Appointed Commodity Director-Grain For Dravo Mechling**

William R. Martyn has been appointed commodity director-grain for Dravo Mechling Corporation, one of the nation's largest barge line operations. He will be filling a newly created position at Dravo Mechling. In announcing this appointment, Peter K. Sour, vice president-sales for Dravo Mechling, said that Mr. Martyn's assumption of this new position underscores the importance that Dravo Mechling attaches to providing a high level of service to the grain market.

Mr. Martyn's most recent assignment with Dravo Mechling was as landing superintendent at Dravo Mechling's New Orleans Landing. He joined Dravo Mechling in 1975 as a field service representative, and was appointed superintendent of the New Orleans Landing in 1979. Prior to joining Dravo Mechling, Mr. Martyn was president of Carter Tug Service in Peoria, Ill., where he dealt extensively with Illinois River grain elevator operations.

**AAPA's 70th Annual Set For October 25, 26 And 27 —Includes First Exposition**

The American Association of Port Authorities will hold its 70th Annual Convention at the Los Angeles Hilton Hotel on October 25, 26 and 27.

For the first time, the convention will feature a full-fledged exposition of equipment and services.

It is expected representatives

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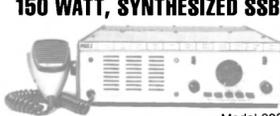
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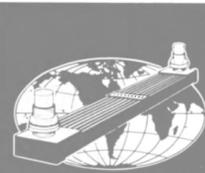
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Maritime Reporter/Engineering News

of over 125 Western Hemisphere ports will attend this 1981 annual meeting, including executive directors and commissioners from more than 90 U.S. ports alone.

For full information, write to **J. Ronald Brinson**, The American Association of Port Authorities, 1612 K Street, N.W., Washington, D.C. 20006.

**Great Lakes Dredge Is Apparent Low Bidder On \$32.9-Million Job**

Great Lakes Dredge & Dock Company of Union, N.J. is the apparent low bidder on a multi-million-dollar contract to construct a 29,000-foot-long sand dike at the Hart and Miller Islands diked disposal area in Baltimore County for the Maryland Port Administration. Construction of the dike will require approximately 5,800,000 cubic yards of hydraulically dredged fill, approximately 260,000 cubic yards of stone slope protection with filter cloth, and approximately 65,000 square yards of 8-inch crusher run roadway.

Construction also includes removal and disposal within the diked area by hydraulic dredging of approximately 1,100,000 cubic yards of unsuitable foundation material, approximately 937 linear feet of sheet pile bulkhead, and various support facilities and services including surveys, sediment and erosion control, instrumentation, and test borings.

Great Lakes submitted a bid totaling \$32,891,567.

**Philadelphia Gear 20-Page Marine Drives Catalog Available**

The Philadelphia Gear Corporation, King of Prussia, Pa., has published a fully illustrated 20-page marine drives catalog.

The catalog includes a full description, including photos, of Philadelphia Gear's capabilities and support facilities. Each unit manufactured by the company is fully described with photographs, front and side view drawings, and complete dimensions and weight tables. Detailed horsepower rating tables are also included for six different units in 10 sizes. Sections are included on best selection procedures, positive drive clutches, gas turbine generator drives and photos of Naval and commercial vessels of all sizes, as well as offshore drilling rigs currently equipped by Philadelphia Gear.

For a free copy of "Philadelphia Marine Drives,"

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**Dan Mortimer Elected President Of New Yard —Gulf Coast Fabrication**

The board of directors of Gulf Coast Fabrication, Inc. has announced the election of **Dan Mor-**

**timer** as president of the new company which has acquired an existing shipyard site in Pass Christian, Miss. The company will engage in all phases of marine construction, primarily offshore deck barges.

Mr. Mortimer recently left Halter Marine, Inc. of New Orleans to start this venture, and prior to that was with Seatrains Shipbuilding of New York City.

Speaking of the company's plans, Mr. Mortimer said: "We

expect to grow in controlled stages to above 100 employees in the coming year. Our current plans are to launch our first barge by September and deliver a 180-foot unit no less than monthly thereafter. By creating a production capacity predicted upon cost-effective techniques and equipment, with building a well-trained and motivated group of craftsmen we will position ourselves to offer very competitive prices and on-time deliveries."

**Ingalls Receives Navy Order For \$11.3-Million Destroyer Overhaul**

Ingalls Shipbuilding Division, Litton Systems Incorporated, Pascagoula, Miss., is being awarded a \$11,388,330 cost plus award fee contract for the regular overhaul of the destroyer USS Arthur W. Radford (DD-968). The Naval Sea Systems Command is the contracting activity. (N00024-81-C-8501)

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**Swiftships Will Build  
Two Supply Cargo Vessels  
For L & P Boat Rentals**

Swiftships, Inc. of Morgan City, La., has contracted with L & P Boat Rentals of Gibson, La., to build two 166-foot steel supply cargo vessels. The vessels will be built at the Mangone-Swiftships yard in Houston, and the first will be ready for delivery this December.

According to Calvin LeLeux, Swiftships project engineer, "We're very pleased that L & P has enough confidence in our workmanship to order not one, but two of our most rugged and dependable boats."

The all-steel vessels will be powered by



Shown completing the L & P Boat Rentals and Swiftships transaction are (L to R): A.J. Blanchard, general manager, Mangone-Swiftships; Paris Broussard and Robert Broussard, both principals of L & P; and Jerry Hoffpauir, president of Swiftships.

two GM 16V149NA marine diesel engines and will be capable of carrying fuel, fresh water, ballast and liquid and dry mud. Each boat will be certified to transport over 500

long tons of deck cargo in addition to a full load of internal stores.

L & P is a subsidiary of Bruce Boat, a \$30-million company with 25 boats and 160 employees whose primary business is providing crewboats for oil companies needing rig supplies.

**J. Frank Williams Receives  
Navy Meritorious Citation**



J. Frank Williams accepts Navy citation from Adm. Thomas B. Hayward.

J. Frank Williams, vice president-sales of Equitable Shipyards, Inc., Southwest region president, president-Navy League, and national director-Navy League of the United States, has been honored and presented with the Navy Department Meritorious Public Service Citation. Presentation ceremonies of the Meritorious Citation by Adm. Thomas B. Hayward, USN, Chief of Naval Operations in behalf of the Secretary of the United States Navy, were held recently at the National Convention of the Navy League in Norfolk, Va.

The Citation cites Mr. Williams for outstanding service to the Department of the Navy in fields of image development, community relations, recruiting and public relations. Mr. Williams has gained enthusiastic civil, industrial and educational public relation support of the highest order for patriotic and Navy programs. His record of civilian voluntary service is outstanding.

**Nashville Bridge Delivers Two  
Integrated Tows To Coastal**

Nashville Bridge Company (NABRICO) recently delivered two integrated, three-barge double-skin petroleum tows to Coastal Towing Inc., Texas, of Houston. Each of the tows consists of a 297-foot 6-inch by 54-foot by 12-foot lead rake barge, a 290-foot by 54-foot by 12-foot mid-box barge, and a 282-foot 9-inch by 54-foot by 12-foot trail barge. Total capacity for each three-barge tow is approximately 96,000 barrels or 4,032,000 gallons.

Each of the six barges is equipped with a heating system for in-transit heating of heavy petroleum products to permit faster pump-off time, eliminating lengthy delays at terminal facilities. Heating of the cargo is accomplished by hot oil circulated through coiling in the cargo tanks. The system is designed for a ratio of approximately four barrels of product for every square foot of heating surface.

Since 1978, NABRICO has built a total of 11 barges for Coastal Towing, Inc., Texas.

NABRICO is a wholly owned subsidiary

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FREE BROCHURE



Lead unit of three-barge tow built by NABRICO for Coastal Towing, Inc., Texas, begins its water journey to Houston at the Nashville, Tenn. shipyard. Barge is part of two integrated, three-barge petroleum tows completed recently by NABRICO for the Texas company.

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

### 33rd Annual Gulf Section Spring Meeting Featured Six Interesting Papers



Pictured at the Spring Meeting of the SNAME Gulf Central Section are (left to right): Bill Mead, Papers chairman; authors R.R. Nachlinger, G.L. Petrie, and F.Y. Michael.

The 33rd Annual Spring Meeting of the Gulf Section of The Society of Naval Architects and Marine Engineers (SNAME) was held at the New Orleans Hyatt Regency Hotel.

The technical section began with a paper on "Assessment of Weather Constraints on Operational Planning and Scheduling," by G.L. Petrie of Hoffman Maritime Consultants, Inc. This paper described the procedures developed to systematically assess weather-related downtime in offshore operations. The second paper, "LOOP—the First Domestic Deepwater Port," by G.A. Works, project manager, offshore facilities, discussed the design criteria, the model testing and the technical aspects of the Louisiana offshore oil port LOOP. The final morning paper, "Towing Resistance Estimation of Offshore Construction Barges," by Richard Y.T. Dai and U.N. Chen of Brown and Root Inc., showed how the residual resistance coeffi-

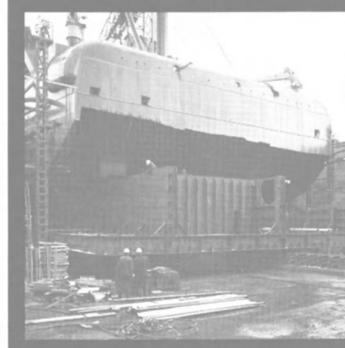
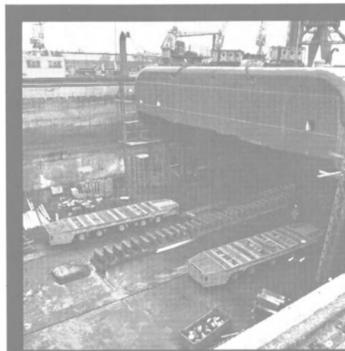
cient CR is directly related to the hull form: bow, stern, and midship sections, etc.

Bill Mead of McDermott Inc., Papers chairman, presented Certificates of Appreciation to the authors at the luncheon. Guest speaker was Gasper J. (Buddy) Stall, Creole Engineering, Inc., who gave one of his informative talks on the history of the Mississippi River, including the first use of the steamboat.

The afternoon technical session began with a paper "A Fluidized Bed Combustion for Use on Inland Waterway Towboats," by Joseph W. Janoush and David T. Williams of Janoush Marine Inc., and Anthony Licausi of Foster Wheeler Corporation, which discussed the possible advantages of coal over oil in the near future. The following paper,

"A New Hull Form to Improve Wave Response Characteristics for Marine Construction Barges," by F.Y. Michael, Livingston Shipbuilding Co., presented the conceptual foundation and outline of a new hull form developed specifically for improving wave response characteristics of marine construction barges. The session concluded with a paper, "Some results on the Response of Moored Vessels," by R.R. Nachlinger of Ultra Marine Inc., and R. Habegger of McDermott Inc., predicting the response of a vessel to a prescribed environment and, secondly, what action can be taken with the mooring system to provide desired results.

A dinner-dance for the guests, held in the Hyatt Regency's ballroom, completed the day's activities.



## Amsterdam Drydock Company Repair Highlights

### Cost saving assembling methods

The conversion of the cable-layer barge "Skagerrak" to a full-fledged, self-propelled seagoing vessel involved, among other things, the building of a new bow of approximately 650 tons of steel.

The pictures show the use of two Kamag trailers putting a 135 tons bottom block into exact position.

The use of Kamag trailers in this kind of operation keeps time and cost to an absolute minimum.



Amsterdam Drydock Company

Amsterdamse Droogdok Maatschappij BV  
Klaprozenweg 89, Amsterdam  
P.O. Box 3006, 1003 AA Amsterdam  
Phone: 020-5209911, Telex: 11476

ADM representative for the U.S.A.:  
T.A.S.T. Corporation, 150 Hinchman Avenue, Wayne, NJ 07470, tel. (201)942-0754, telex 183 395

**Richard Palk Elected  
President Of American  
Trading Transportation**

Richard Palk has been elected president of American Trading Transportation Company, Inc., according to an announcement made by that New York City-based shipping company. Mr. Palk, who had been vice president and gen-

eral manager, will now serve as chief executive officer. A Kings Point graduate, he originally joined the American Trading fleet in 1951 as a third assistant engineer, and has held increasingly responsible engineering and executive positions with the company since that time.

Concurrently with Mr. Palk's promotion, Frank J. Murphy assumes the newly created position

of chairman of the board of American Trading Transportation. In this capacity he will continue his association with the company that extends over 42 years, and will assume responsibilities in the areas of organizational development, industry relations, and long-range planning.

American Trading Transportation Company operates a fleet of U.S.-flag tankers. The company is

a wholly owned subsidiary of American Trading and Production Corporation, a diversified Baltimore-based concern with interests in transportation, oil and gas, real estate, and manufacturing operations.

**\$13.2-Million Award To  
Norfolk Shipbuilding For  
USS Austin Overhaul**

Norfolk Shipbuilding and Drydock Company, Norfolk, Va., is being awarded a \$13,200,000 firm fixed price contract for the regularly scheduled overhaul of the amphibious transport dock USS Austin (LPD-4). The Supervisor of Shipbuilding, Conversion and Repair, USN, Portsmouth, Va., is the contracting activity. (N62678-76-C-0036)

**Robert Doyle Named  
Marine Industry Manager  
At Ameron**

Robert Doyle has been appointed marine industry manager for Ameron's Protective Coatings Division, according to James Slatik, division president. He will operate from Ameron's East Brunswick, N.J. office coordinating the division's domestic and international marine coatings activities.

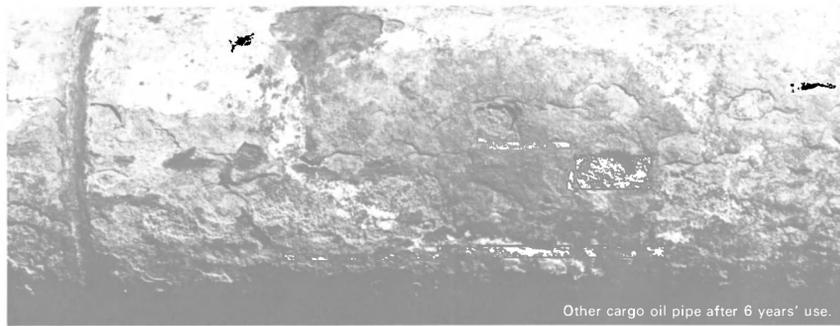
Mr. Doyle, a recognized authority in marine corrosion control, has a BS degree in chemistry from Franklin and Marshall College. He is a registered corrosion engineer in the state of California, and a certified NACE corrosion specialist.

**\$58-Million Navy Order  
For 8 Oceanographic  
Systems To Hydrosience**

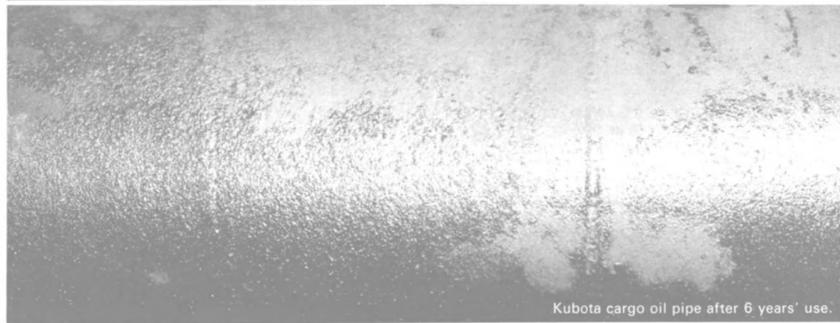
Whitehall Corporation's subsidiary, Hydrosience, Inc., Dallas, Texas has signed a firm fixed price prime contract with the U.S. Navy for the production of eight oceanographic systems, with an option for four additional systems. The Surveillance Towed Array Sensor System (SURTASS) is a high priority Navy program for the collection and processing of undersea acoustic data. The contract price, including the option, totals \$58,000,000. Contract schedules call for delivery of the first eight systems at approximately 75-day intervals from January 30, 1982, through July 15, 1983, for delivery of the four optioned systems from September 30, 1983, through May 15, 1984. Deliveries will total \$22,632,000 in 1982, \$23,097,000 in 1983, \$12,033,000 in 1984, and \$238,000 in 1985, assuming exercise of the option.

Production facilities more than adequate to meet the contract requirements were acquired three years ago. Equipment and personnel are already on hand to insure that contract delivery schedules are met or bettered.

**The same age!  
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Other cargo oil pipe after 6 years' use.



Kubota cargo oil pipe after 6 years' use.

The pipe above obviously needs replacement, soonest possible, while the Kubota cargo oil pipe, shown below it, still has several years of good service life left. When replacing the pipe in your vessels, consider that Kubota's give more than two times longer service than most others. Fifteen years of use without replacement is ample proof of their superiority. Why?

Kubota materials and methods cannot be found anywhere else in the world. The material is KCP-3L, a chrome manganese steel especially developed by this company. It is made by Kubota's exclusive centrifugal casting techniques, widely acknowledged to be of the highest technological level. The highest degree of weldability gives it the greatest facility of use. That is why fully 95% of all Japanese tankers use Kubota cargo oil pipe. And why shipbuilders and repair docks around the world keep it on hand for installation and replacement. Write today for full information on how to raise the efficiency of your tanker operations.



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Kubota, Ltd., Bangkok Office: Thanya Bldg., 4th Floor, 62 Silom Road, Bangkok, Thailand Phone: 234-7680, 234-7882 Representative of Kubota, Ltd. (Jakarta Office): Skyline Building 16F J.L.M.H. Thamrin No. 9 Jakarta, Indonesia Phone: 323977



**Another Panamax Bulker  
Delivered By B&W Yard  
To Liberian Owner**

Burmeister & Wain Shipyard in Copenhagen recently celebrated the naming of Yard No. 883, a Panamax bulk carrier of the yard's fuel-saving type. Of approximately 64,000 dwt, the ship

was ordered by A/S Klaveness Chartering of Oslo, and was named by Mrs. Bibbi Preststulen, wife of managing director Tom Preststulen, president of West African Bulk Shipping Inc.

Christened Baumare, the ship was disposed of by Torvald Klaveness A/S and delivered to the shipping company Baumare Inc. of Monrovia, Liberia. This marks

the third vessel of this new type delivered by B&W during a 6-month period; an additional 14 are on order at the Copenhagen yard.

While many of the more conventional Panamax type bulk carriers operating today have a fuel oil consumption of 55-60 tons daily, B&W Shipyard has succeeded in reducing the fuel con-

sumption to approximately 37 tons per day at an average speed of 15 knots. The average is defined as the average for ballasted and fully loaded conditions.

This improvement in operating economy has been achieved by a successful development of the hull design with bulbous bow, an extremely flat-sectioned aft body, and by the installation of a two-stroke, long-stroke B&W 5L80-GFCA diesel engine having an output of 12,600 bhp at 90 rpm. Auxiliary machinery includes two B&W 5T23LH diesels driving 500-kw generators, and a 500-kw turbogenerator.

Classed +1A1 by Det norske Veritas, the Baumare has an overall length of about 738 feet, molded beam of 106 feet, molded depth of 59 feet, and maximum draft of 50 feet. The Total cubic capacity (grain) of the holds is 79,100 cubic meters. The ship has seven large, almost identical hatches with inclined coamings

and MacGregor hydraulically operated steel hatch covers. Weld

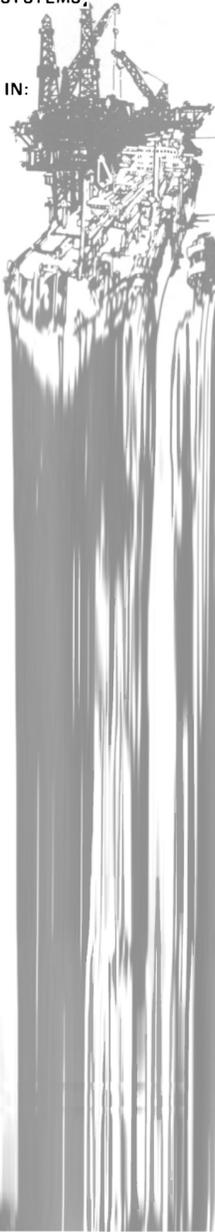


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**Hyundai To Build 9 Ships  
For United Arab Shipping  
—Total Cost \$400 Million**

Korea's Hyundai Group has won what is reported to be the largest single shipbuilding contract in history to build nine vessels for the United Arab Shipping Company. Under the USD 400-million contract, Hyundai will construct nine containerships of 35,500 dwt each and 14,000 steel containers.

The United Arab Shipping Company, the largest shipping company in the Middle East, is jointly operated by Kuwait, Bahrain, Iraq, Saudi Arabia, Qatar and the United Arab Emirates.

The vessels will be built at the Hyundai Ulsan Shipyard for delivery January 1983 through October 1983. The container boxes, consisting of 20-foot and 40-foot steel vans are to be fabricated by Hyundai Precision and Industry Co. Delivery is scheduled for completion in June 1983.

Main propulsion for each vessel will be provided by a Hyundai-built engine developing 18,400 bhp and giving a speed of 17.8 knots.

Since 1974, Hyundai Heavy Industries has constructed four 19,700-dwt containerships and twenty-four 23,000-dwt multipurpose cargo carriers for the United Arab Shipping Company.

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Simrad designs and builds every piece of marine electronic equipment to meet the most stringent legal requirements not only of the U.S. Government but all over the world. Important? Yes. But not as important as the everyday safety of your boat and your crew. So Simrad goes beyond legal requirements to make sure that your electronics are accurate, reliable, tough and easy-to-use. Quality that you can depend on, and economical so that you can afford to have all the protection that you and your crew deserve.

**Simrad can help you pass IMCO inspection... and much more!**

Simrad Loran C's are designed and manufactured to meet or exceed the U.S. Coast Guard endorsed RTCM Minimum Performance Standard (MPS).



**TL-856 Loran C Navigator** automatically computes and displays TD's, Lat/Long, course, ground speed, time and distance to any of ten waypoints, as well as cross-track error. It can acquire and track all Loran C masters and secondaries worldwide. Four tunable and two preset notch filters for professional performance even in high interference areas. *TL-856 makes it all simple.*



**2182 KHz Watch Alarm Receiver.** Simrad's new, compact, FCC approved Watch Alarm Receiver, RW 105, fulfills all legal requirements of the new IMCO/SOLAS Regulations. The RW 105 also meets the specifications for most other maritime regulatory agencies. It can be set to receive all transmissions on the 2182 KHz distress frequency or automatically mute all but distress signals preceded by the two-tone alarm. An internal digital clock lifts the mute during radio silence periods. Connection for optional tape recorder or remote speaker, and built-in test generator are standard. *Easily fits into limited space.*



**New Digital Recording Sounders.** Simrad 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 0.550 fathoms. For navigating in shallower waters, the 200 KHz ED-162 has four ranges from 0.30 feet to 0.250 fathoms. The optional IR-201 Remote Digital Analog Indicator displays depth in feet, meters and fathoms. An optional transducer selector with alarm (TS-101) allows use of up to four transducers. Due to Simrad's special engineering, *some vessels can be retrofitted from inside the hull without having to drydock.* Contact Simrad for details.



**TL-838 Loran C Receiver** simultaneously displays two lines of position from automatically acquired and tracked masters and all available Loran C secondaries. TL-838 has four tunable and two preset notch filters for outstanding performance, worldwide. It incorporates a three point memory, and *very fast acquisition and setting.*



**Loran C Coordinate Converter Model TC-28A** adds total navigation functions to most Simrad Loran C Receivers. Converts TD's to Lat/Long, memorizes up to ten waypoints and calls up course and distance to any of them. Computes and displays on command time to destination and cross-track error. Installs directly on TL-838 or separately with other Simrad models. *Makes them all navigators.*



**Two IMCO approved automatic direction finders,** the TD-A202B and the TD-C328HATS (shown), are now offered by Simrad. The TD-A202B has frequency ranges of 200-580 KHz beacon band and 1.5-2.8 MHz marine band. The TD-C328HATS has a range of 200 KHz to 13.5 MHz. Both are highly sensitive superheterodyne receivers. *They lock in fast.*

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**Westinghouse Awarded \$40-Million Order For Navy Generator Sets**

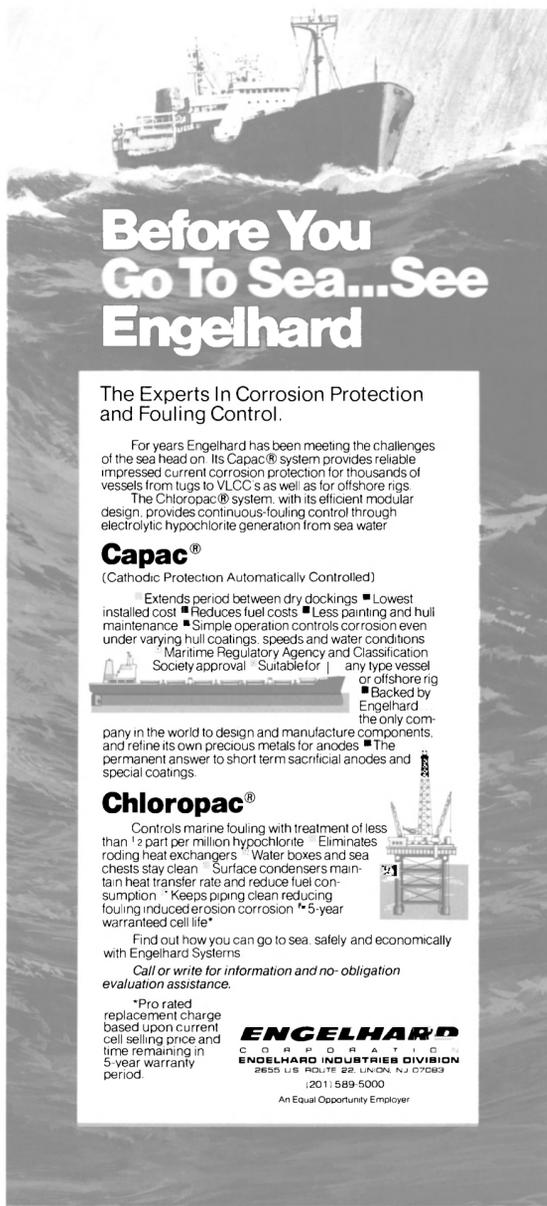
Westinghouse Electric Corporation, Sunnyvale, Calif., has been awarded a \$40-million contract by Newport News Shipbuilding to build eight turbine generator sets for the CVN-17, the Navy's fifth nuclear aircraft carrier.

The contract was awarded to the Westinghouse Marine Division in Sunnyvale, a division of Westinghouse Electric Corporation, headquartered in Pittsburgh, Pa.

The eight turbine generators are similar to others previously built by Westinghouse for three of the Navy's existing nuclear aircraft carriers, the Nimitz, Eisenhower, and Vinson. Turbines, auxiliary condensers

and the foundation of the eight turbine generator sets will be built by the Marine Division in Sunnyvale. Electrical components for the turbine generator sets will

be manufactured at Westinghouse's East Pittsburgh plant. Delivery of the turbine generator sets to Newport News Shipbuilding is scheduled for 1983.



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The Experts In Corrosion Protection and Fouling Control.

For years Engelhard has been meeting the challenges of the sea head on. Its Capac® system provides reliable impressed current corrosion protection for thousands of vessels from tugs to VLCC's as well as for offshore rigs.

The Chloropac® system, with its efficient modular design, provides continuous-fouling control through electrolytic hypochlorite generation from sea water.

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(Cathodic Protection Automatically Controlled)

- Extends period between dry dockings
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- The only company in the world to design and manufacture components, and refine its own precious metals for anodes
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**Chloropac®**

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- Surface condensers maintain heat transfer rate and reduce fuel consumption
- Keeps piping clean reducing fouling induced erosion corrosion
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Call or write for information and no-obligation evaluation assistance.

\*Pro rated replacement charge based upon current cell selling price and time remaining in 5-year warranty period.

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The Oxy Trader, one of two Avondale-built Catugs recently delivered to Occidental Petroleum.

**Hvide Delivers First Two Catug Vessels To Occidental Petroleum**

Hvide Shipping Incorporated, headquartered in Ft. Lauderdale, Fla., handed over the Oxy Trader and the Oxy Producer, two of the three Catug vessels ordered by Occidental Petroleum Corporation. Construction is almost complete on the third Oxy Catug, the Oxy Grower, which will go into service this summer. There are 12 Catugs scheduled to be in service by 1983.

Built by Avondale Shipyards in Avondale, La., the three vessels are 42,260-dwt liquid bulk carriers, specially designed to transport highly viscous, dense and corrosive super phosphoric acid (SPA). Many other bulk liquid products can also be carried in these vessels.

Designed by Hvide Shipping and its affiliate, Seabulk Corporation, the Catug is an integrated tug/barge (ITB) that combines the efficient hull form of a ship with the wide-beam, shallow-draft characteristics of an ocean-going barge. Tug and barge sections are constructed separately but are designed to be employed as an integrated unit. The design utilizes a twin-hull catamaran tug with a propulsion and steering system in each hull to increase its safety and reliability. It is more maneuverable than a single- or even a twin-screw ship. The tug and barge may be separated rapidly in case of emergency.

Other benefits inherent in the design include lower capital costs and substantially lower manning requirements than conventional

ships, all resulting in markedly reduced financial and operating costs.

The Oxy Catugs are powered by two 9,100-bhp Colt-Pielstick, 14-cylinder direct reversing engines, one in each hull. Each engine drives a four-bladed, 20-foot-diameter slow-turning propeller. Each power unit has its own separate rudder and steering mechanism. A service speed in excess of 15 knots has been confirmed.

Built to ship scantlings with heavy reinforcement for the very dense SPA cargoes, the Oxy Catugs have an SPA carrying capacity of 40,100 metric tons at a draft of 36 feet. The SPA tanks are located in the center of the barge; they are clad with 3,17L stainless steel. Each tank is equipped with heat exchangers drawing steam from two waste heat boilers in the engine uptakes or from a separate boiler plant on the barge. This maintains the SPA at a temperature above 150 F while in transit. Hydraulically operated submerged pumps are capable of discharging all cargo tanks to less than four gallons within 20 hours. Tanks are cleaned by hot fresh water washing via a portable Butterworth system.

Wing tanks are coated with water-based inorganic zinc, and may be used to carry back-haul cargoes. The vessel is also fitted for protectively located segregated ballast. The unique design also permits the Catugs to carry a wide variety of other liquids—clean and dirty oil products, and liquid chemicals.

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# RAYCAS.

## Because safety at sea is no accident.

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

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

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

1. add only the RAYCAS module to an existing Raytheon 16-inch Bright Display radar;
2. add the RAYCAS module and 16-inch Bright Display plus adaptive interface to existing Decca, Sperry, or Selenia radar systems;
3. install the complete RAYCAS/Raytheon Bright Display Radar System.

Whichever you choose, you get a proven Collision Avoidance System that exceeds existing requirements . . . and cost less than other units.

**Unmatched radar performance.**

The Raytheon Bright Display presentation helps make RAYCAS the most effective Collision Avoidance System in the world.

In addition to direct daylight viewing, it features two-level video and automatic interference rejection. This provides the clutter suppression and noise-free picture so essential for reliable target acquisition and tracking. Proven 3 and 10-cm interswitch capability

assures compliance with MARAD requirements for dual installations.

**User-oriented presentation.**

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

**RAYCAS features.**

- **Relative-motion Display:** Centered or 70% off-centered with course-up or north-up.
- **True-motion Display:** Own ship moving across scope with course-up or north-up.
- **Target Acquisition:** Manual or automatic with fixed and adjustable guard zones.
- **Tracked Targets:** Up to the 20 most dangerous targets.
- **Target Vectors:** Indicate true or relative courses and speeds; adjustable time base helps predict future position.
- **Target Trails:** Indicate target's past position and course.
- **Dangerous Targets:** Automatically selected by pre-set CPA (Closest Point of Approach)



and TCPA (Time to CPA).

- **Points of Potential Collision:** Automatically displayed.
- **Digitally Displayed Data:** CPA and TCPA; own ship's speed and course; target's range, bearing, speed,

and true course; own vector length; vector time; BCR (Bow Crossing Range) and BCT (Bow Crossing Time).

- **Trial Maneuver:** Scope displays results of own ship's trial course and speed changes.
- **Visual and Audible Warnings:** Dangerous target, target in guard zone, equipment fault, trial maneuver, and target lost.
- **Automatic Drift Correction:** Computed by tracking on fixed navigation aid.
- **Navigation Lines:** Scope presentation of 8 lines for fairways.
- **Brightness Controls:** Separate adjustments for radar and computer video.
- **Performance Monitor:** Manual or automatic monitoring of radar performance.

**Two-year warranty.**

The American made RAYCAS, like the more than 5000 Raytheon Dual 3 and 10-cm Radars now in service, is

already a proven performer. Installations have been made on all types of vessels from coastal ships to VLCC'S.

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



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# Victory



**Super-tough  
help win the battle**



*The boot-topping and freeboard areas of this tanker have been painted with a coating system that includes a two-component aliphatic urethane topcoat based on Desmodur N and Desmophen urethane resins from Mobay.*

Outstanding weatherability and excellent corrosion and abrasion resistance are just a few of the benefits of marine coatings based on Mobay's Desmodur N and Desmophen urethane resins.

There are a lot more. For example, an outstanding low-temperature curing capability lets you apply a urethane coating at temperatures as low as 20° F and still achieve a complete cure.

# at sea.



**marine coatings based on Mobay urethane chemicals  
against corrosion, abrasion and high maintenance costs.**

And urethane coatings save money because they help to minimize surface preparation during dry docking. This means lower labor and material costs, minimized lost income while your vessel is out of service, and reduced dry dock service charges.

And, if that's not enough, their unparalleled gloss and color retention capability keeps beautiful, tough

urethane marine coatings looking better longer.

All of these factors make urethane coatings the top choice to fight off the rigors of marine service...from ocean-going tankers to offshore rigs to tuna boats.

For more information on the unbeatable cost/benefit story of urethane marine coatings, and the names of suppliers, call Jack Bracco at Mobay. Phone 412-777-2876, or write:

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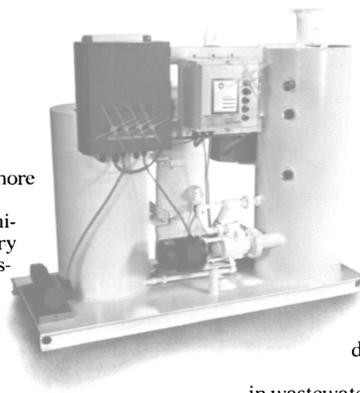
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Omnipure is a Type II Marine Sanitation Device which is U.S. Coast Guard



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Model 12M812-27: 6'3" x 5'9" x 3'6" D; 120 man unit; 3,600 gal/day  
\* Copyright 1981, Sigma-Chapman, Inc.

**Cayman Energy, Ltd.  
Offers Trelleclean  
Hull Cleaning Service**

Cayman Energy, Limited, Cayman Islands, British West Indies, recently initiated an underwater hull cleaning service with the cleaning of the VLCC Grand Alliance, using the Trelleclean System manufactured by Trelleborg SA of Sweden. The company feels that the new hull cleaning service will complement their existing transfer operation for crude oil, products, chemicals and LPG. Cayman Energy also announced that they will start ship bunkering at Cayman Brac in August. For further information on Cayman Energy's transfer operations or new hull cleaning service, Write 50 on Reader Service Card

**Hawaii Awarded Major  
New OTEC Project**

Senator Spark Matsunaga (D-Hawaii) announced recently that the National Oceanic and Atmospheric Administration (NOAA) has selected the Hawaiian Dredging and Construction Company, a subsidiary of Dillingham Corporation of Honolulu, as the lead company for the \$7.6-million ocean thermal energy conversion (OTEC) cold water pipe at-sea project. This is the second largest OTEC project ever awarded, and the largest directly involving a Hawaii firm, said Senator Matsunaga.

A \$600,000 contract has been let for the design phase of the project. The NOAA Office of Ocean Technology and Engineering Services, which will oversee the test, noted that an estimated \$7 million has also been allotted for pipe construction, platform alterations, instrumentation, deployment, and testing of the pipe and data analysis. The pipe itself will be 10 feet in diameter, 1,000 feet long, and will be built out of fiberglass.

**RCA Service Company  
Introduces Marine  
Services Global Network**

RCA Service Company recently announced the introduction of a worldwide service network to provide fixed-price maintenance coverage for marine communications and navigation equipment. The service is being provided at over 230 ports of call in 60 countries, according to **Martin H. Rubin**, division vice president, Industrial Electronic Services, RCA Service Company.

"The package provides quality service at a fixed monthly price," **Mr. Rubin** said. "We're also offering umbrella-type coverage with discounts of up to 25 percent, including 15 percent on service contracts on new equipment purchased or leased from RCA at a U.S. port, and an additional 10 percent for placing all of a ship's equipment under RCA contract."

Following notification of a need for service, **Mr. Rubin** explained, RCA will immediately alert a marine service center at a ship's next port of call to be prepared to provide service as soon as the ship reaches port. RCA Service Company, a division of RCA Corporation, is headquartered in Cherry Hill, N.J.

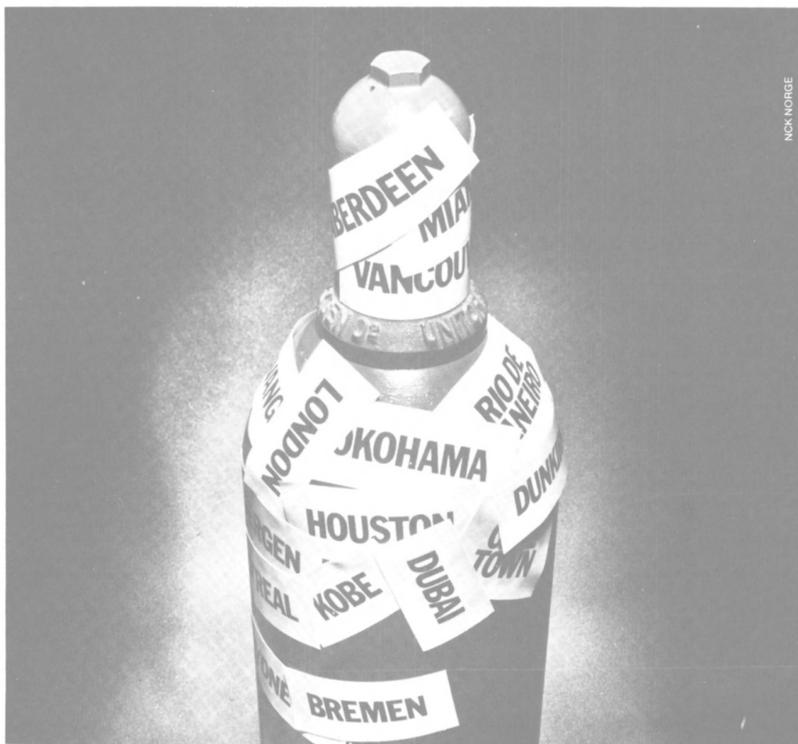
For further information,  
Write 54 on Reader Service Card

**Navy Asks Bids For Repair  
And Drydocking Of 'Juneau'**

The Supervisor of Shipbuilding, Conversion, and Repair, USN, Long Beach Naval Shipyard, Building 300, Long Beach, Calif. 90822 will open bids on or about August 11 for the drydocking and repair of amphibious transport dock USS Juneau (LPD-10). Bidding is restricted to the Long

Beach, Terminal Island, San Pedro, San Diego, and San Francisco areas.

Applicable plans and drawings will not be distributed with the solicitation, but may be examined at the Purchasing Office at the address above. Work is to commence on or about November 30, 1981, and be completed on or about August 27, 1982 (IFB N65870-007-81).



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### HUDSHIP Delivers Utility Vessel To Gray Mackenzie Marine

Hudson Shipbuilders, Inc. (HUDSHIP) of Pascagoula, Miss., recently delivered the utility boat Graytest (shown above) to Gray Mackenzie Marine Service, E.C., located in Bahrain. The Graytest is a modified version of the standard HUDSHIP 120-foot utility vessel. The primary modification was to crew cabins and living accommodations, redesigned to maximize crew comfort and provide more crew privacy. Accommodations are provided for 19 men.

Graytest is the fifth vessel delivered to Gray Mackenzie by HUDSHIP. Like all in the series, she was delivered ahead of schedule and within budget.

The afterdeck is fitted with a National Marine 12.5-ton crane with 100 feet of boom. Mounted at the center line, the crane can service the entire cargo deck. There are Hydradyne hydraulic

winches mounted on each side of the crane allowing a four-point mooring system.

Graytest is powered by twin GM Detroit Diesel 16V92NA engines, each rated 600 bhp at 1,800 rpm, with Twin Disc 520 gears. Auxiliary power is provided by two 99-kw Kato generators powered by GM Detroit Diesel 6V92 engines.

The pilothouse was designed for maximum 360-degree visibility, with the electronic package arranged for easy use. The electronics include a Decca 914C marine radar, a Sailor SSB receiver model R-105, a Sailor SSB transmitter model T-124, a Sailor model RT 144AC VHF transceiver, a Datamarine 2650 depth indicator, and a Sperry SR130 gyrocompass.

The vessel was built and tested to American Bureau of Shipping standards and is classified A-1 All Ocean Service.

the first vessel built for Ocean Barge Corporation by Bay Shipbuilding Corp.

The 550-foot by 78-foot tug notch barge will be used as a bulk cargo barge, handling grain, coal and other bulk cargoes. The stern will be fitted with a deep notch to accommodate a tug of 7,200 hp.

Two adjustable skegs will be provided to maintain directional stability under towing conditions.

Attending the ceremony were the owners and their representative, representatives of the American Bureau of Shipping, and U.S. Coast Guard and Bay Shipbuilding Corp. management personnel.

### Racal-Decca Introduces New ARPA Radar System At Whitehall Club Reception



Shown at the reception introducing Racal-Decca's new ARPA Radar System are (clockwise from lower left): Gordon Gray, Racal-Decca Marine Radar, Ltd.; Ed Blair, Elcom Electronics; Marie Santoro, Racal-Decca Marine, Inc.; Alan Thompson, Racal-Decca Marine, Inc.; and Gilbert Fonda, Operational Radar Services.

Racal-Decca Marine, Inc. recently introduced their new, all-weather ARPA (Automatic Radar Plotting Aid) Radar System at the Whitehall Club in New York. Over 100 shipowners and other members of the maritime community attended the introduction which featured operational demonstrations of the D-Arpa System.

The new ARPA Radar System is designed to provide the mariner with a first-class, easy-to-operate, automatic aid to safe navigation under the most adverse conditions of weather, traffic density and rapid situation changes.

The D-Arpa offers four clear reasons for outstanding performance and dependability: (1) Automatic All-Weather Clutter Control—The data extraction system has its own independent form of the Racal-Decca Clearscan video processing, which automatically and adaptively provides clutter and interference-free input for the tracking system. (2) Gain Optimized for Each Target—Separately optimized gain for each tracked target maximizes track-

ing accuracy and integrity for all targets at all ranges, regardless of operator gain control settings. (3) Accurate Continuous Tracking—The storage of position and velocity of tracked targets in the true-motion mode provides accurate and continuous target information during and after your own ship's maneuvers. Less advanced Arpa systems "free-wheel" their tracks until they can establish new relative velocities for each target. (4) Track Change Warning—Unique to the Racal-Decca target tracker is its ability to provide smooth, stable vectors in an unchanging situation, yet quickly detect and provide rapid warning of changes in target speed and/or course.

The Racal-Decca ARPA is a complete radar display designed for use as a master or slave unit with Racal-Decca Clearscan radars. It meets, or exceeds all IMCO and U.S. Coast Guard requirements.

For a free full-color, 16-page brochure on Racal-Decca's new ARPA Radar System,

Write 40 on Reader Service Card

### Bay Shipbuilding Lays Keel For Ocean Barge Corp. Bulk Cargo Barge

The keel for Hull 730 was laid recently at Bay Shipbuilding Corp., Sturgeon Bay, Wis. The

oceangoing bulk cargo barge is being built for Ocean Barge Corporation, New York. This will be

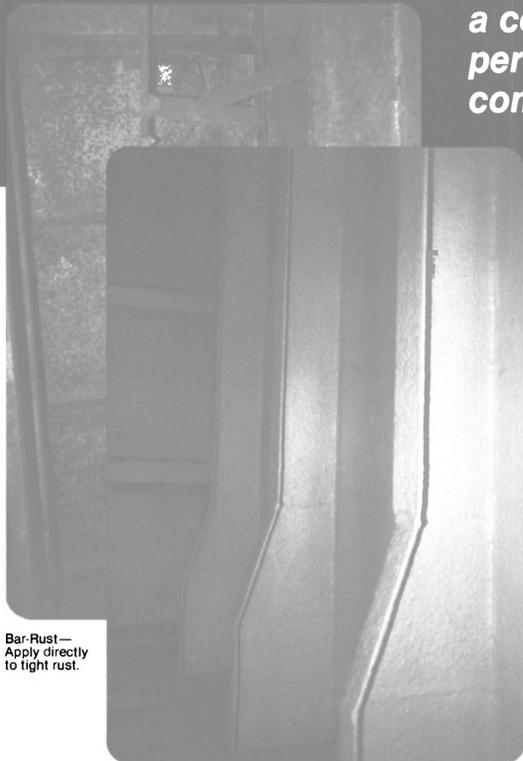


Shown at the recent keel-laying for Hull 730 are, left to right; Arthur Zuehlke, president, BSC; Bruce Shaw, assistant operations Manager (Hull), BSC; Roy Aiken, operations manager, BSC; Francis Kolbeck, manager contracts and estimating, BSC; George Geiger, vice president and general manager, BSC; Harry Taylor, ABS; Rod Whannell, welding superintendent, BSC; Robert Hynds, owner's representative; and Pat O'Hern, boat boss, BSC.

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### IOT Opens New Southern Fleet Center In Tampa

Interstate and Ocean Transport Company (IOT) has announced the recent opening of its new Southern Fleet Center at 2040 Guy N. Verger Boulevard, Tampa, Fla. The new center is strategically located in the Port of Tampa to support Interstate's Gulf Coast fleet of superbarges. These mammoth barges deliver petroleum

and petrochemicals to ports along the Gulf Coast of the United States, in the Caribbean Islands, and in Mexico.

Headquartered in Philadelphia, IOT is said to be the largest independent marine transporter of petroleum products in the United States. With their combined East Coast and Gulf Coast fleet of 53 barges and 37 tugs, Interstate serves ports as far north as Canada, all along the East and Gulf

Coasts of the United States, and as far south as Puerto Rico.

Interstate has been operating in the Gulf of Mexico for over 20 years. The company moves a large volume of oil from the Houston refining area to ports in the Southeastern United States. In the Port of Tampa alone, Interstate delivers approximately 19-million barrels of gasoline and jet fuel each year. A large volume of refined products is deliv-

ered to this area, but it is estimated at least 50 percent of all the gasoline purchased in the State of Florida was transported by Interstate.

### New Yard In Liverpool To Build Offshore Units

A new yard is being established in Liverpool to build accommodation and power modules and associated structures for offshore oil rigs.

The facility is a joint venture by the Merseyside-based McTay Engineering Group and the Manchester firm, Redpath Engineering Ltd., and is being set up at East Float, Birkenhead.

Redpath McTay Merseyside is tendering for two modules and a helicopter deck for a rig planned for the North Sea's Hutton Field by Conoco. A spokesman for McTay's said the company hoped to start work later in 1981.

### Reel-O-Matic Modifies Standard Product For Special Application

Reel-O-Matic Systems, Inc. of Wrightsville, Pa., has recently been contracted to modify one of its standard line of products for shipboard use—an application that required some very special attention. The customer had a requirement to take-up and measure wire cable onto a metal reel in a winding operation. The machine is designed to be bolted to the deck of an oceangoing vessel, hence corrosion resistance was an important consideration.

In order to satisfy these requirements, Reel-O-Matic provided a standard RS/VS II with a special steel fabricated reel. For the winding operation, the 1½-hp, variable-speed drive had to be coupled with a clutch. A special jack shaft and mechanical clutch assembly was chosen for accessibility and simplicity of operation.

All exposed shafting is constructed of stainless steel, and every bearing is of the sealed type. The motor and control are both totally enclosed units to prevent rust and corrosion on electrical contacts. Chain guards are also sealed to protect chains and sprockets from salt water.

The most challenging area to treat was the chrome shaft on the hydraulic jack. It not only had to be corrosion resistant, but also had to resist the wear from movement. This was accomplished by dismantling the jack and plating the shaft with a special process called "Metatuff." When all these efforts were completed, the surface was prepared for paint with a special galvanizing primer that was sprayed on as an undercoat. Over this, Reel-O-Matic applied a coat of durable rubberized paint to finalize this process.

For additional information on Reel-O-Matic products, Write 55 on Reader Service Card

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Write 129 on Reader Service Card

**\$400 Million To Be Spent  
On Newfoundland Offshore  
Oil Drilling This Year**



Hon. Neil Windsor

The Honorable Neil Windsor, Newfoundland's Minister of Development, recently reported that \$400 million will be spent in drilling for oil off the coast of his Canadian province this year, and that oil production should begin by 1987.

Noting that Mobil's Hibernia find alone contains 1.85 billion barrels of oil and two trillion cubic feet of gas, Mr. Windsor told business editors attending a Newfoundland press luncheon at the Waldorf-Astoria Hotel in New York City recently:

"The important thing to keep in mind is that these excellent results have been achieved despite the fact that oil exploration permits cover only one-eighth of our continental shelf which covers 730,000 square miles."

The Newfoundland Government official said that offshore oil was but one of the developments which "has placed Newfoundland on the threshold of major social and economic change over the next 10 years."

He disclosed that a decision will be made late this year on whether to develop the Gull Island hydropower site, the Muskrat Falls site or both, on Labrador's Churchill River. The Muskrat Falls plant would cost \$3 to \$4 billion, while the Gull Island project would cost \$4 to \$6 billion. Present plans call for development by 1987.

"The Gull Island site alone would be equivalent in oil terms of 100,000 barrels a day, renewable forever," Mr. Windsor said, noting that Newfoundland has been having discussions with such potential users as the Power Authority of the State of New York, and a number of energy intensive industries.

Mr. Windsor also discussed other promising developments which offer new opportunities for investors.

Thanks to the 200-mile limit, Newfoundland's landed volume of fish is expected to double by 1985. Over the past two years alone, landings have increased by 29 percent from 569,000 to the 739,000 metric tons expected this year. The upsurge in Newfound-

land's fishing industry opens new opportunities for manufacturers of fishing gear, vessels, and related equipment, with even more opportunities for food processors capable of producing finished consumer products as well as companies in canning, bottling, pickling, and related product lines.

Over \$1 billion of the province's exports is ore, of which 85 percent is iron ore produced in Labrador. In addition to iron, the

province produces zinc, asbestos, gypsum, copper, lead, gold, silver, cadmium, and talc. Recently, there have been finds of uranium, chromite, tungsten, and molybdenum. Due to 1977 legislation which increased the tempo of exploration, the number of stakes increased from 300 to 6,244 claims in 1979, with a further 13,099 claims in 1980.

Labrador contains 41-million cords of high-quality spruce and

fir which could lead to an annual cut of 150,000 cords. Pilot projects to ship the production via special icebreakers year-round have proved successful.

Manufacturers of plastic products, sheet metal and cast items, marine electronics, survival and safety gear, and numerous other items should find Newfoundland a feasible and profitable site in the wake of the province's accelerated development tempo.

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**Bayou Black Shipyard Delivers  
Cummins-Powered Push Boat  
To Hillman Marine**

Bayou Black Shipyard recently delivered the push boat, the 'Bengal Phil', to Hillman Marine, Inc. of Morgan City, La. The boat has a length of 60 feet, a beam of 25 feet, and depth midship of 9 feet.

The Bengal Phil's fuel capacity is approximately 16,000 gallons; water capacity is approximately 5,600 gallons.

The hull is of steel construction. A special feature of the boat is the 36-inch wide, 1/2-inch thick push knees fabricated by the shipyard. The main cabin and pilothouse are of aluminum construction, which gives the boat a lower center of gravity. Another advan-



The 60-foot push boat 'Bengal Phil' was recently delivered by Bayou Black Shipyard to Hillman Marine.

tage of the aluminum construction will be in the minimum maintenance time on the superstructure.

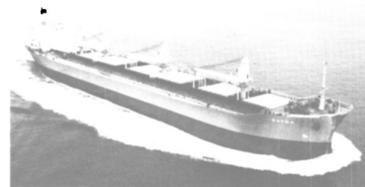
The boat's main propulsion is provided by two Cummins, KTA 1150 diesel engines, each rated at 470 bhp at 1,800 rpm driven through Twin Disc model 520 reverse/reduc-

tion gears. Main engines are air started supplied by the boat's two air compressors. Shafts are 6-inch cold roll built up with stainless steel. Propellers are four-blade, 58-inch by 44-inch stainless steel.

Electric power is supplied by two GM Detroit Diesel 30-kw generator sets. Generators are air and electric start. Electronic equipment supplied by the shipyard includes an Epsco model 504 radar, two Drake MR-155 VHF radios, and one Raytheon Ray 350 loud-hailer system.

The boat will mainly be used in the moving of inshore drilling rigs and barges.

**Panamax Bulker  
For Greek Owner Delivered  
By Hitachi Zosen**



The 60,010-dwt bulk carrier Rayna (shown above) was delivered recently to Epos Marine Corporation (Greece). She was constructed at the Hiroshima Works (Innoshima) of Hitachi Zosen to American Bureau of Shipping classification.

The Rayna is a Panamax type standard bulk carrier, the largest size capable of transiting the Panama Canal. She can carry cargoes of grain, ore, coal, and lumber. The ship is fitted with four deck cranes for loading at ports unequipped with cargo-handling facilities. To increase carrying capacity, the vessel has upper wing tanks designed to load grain.

Main propulsion is provided by a single Hitachi/Sulzer 6RND 76M diesel engine with a maximum continuous rating of 13,680 bhp at 112 rpm. This engine uses an improved fuel injection system and the "derating" method for control of engine output to save on fuel consumption. Maximum trial speed was 16.845 knots.

Rayna has an overall length of approximately 736.5 feet, beam of 105.6 feet, depth of 58.4 feet, and full-load design draft of 40.7 feet. Cargo hold capacity of the 32,293-gt ship is 83,072 cubic meters.

**Literature On Oceanographic  
Data Buoy System Offered By  
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Literature is available on Raytheon Ocean Systems Company's (East Providence, R.I.) oceanographic data buoy systems, which are used to collect data on current, conductivity, pressure, and salinity.

In applications at continental shelf depths, Raytheon's buoy systems have a record of proven survivability, reliable direct or satellite data link, rapid deployment, and long life. The systems are easily serviced and can be equipped for multilevel sensing.

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**Promet Awarded Contract For Second Dredging Job In United Arab Emirates**

Promet Private Limited of Singapore recently won a \$8.8-million (about \$8.4 million) contract for the second stage dredging of Sharjah Lagoon and Al-Hamriyah Port in United Arab Emirates.

This is a follow-up of Promet's earlier \$27-million contract won in the face of stiff competition from traditional contractors in the dredging and reclamation business in 1977. That contract, which took nine months to complete, involved the dredging of four million cubic meters of mostly hard materials to a depth of 25 meters with five kilometers of dredge pipes fabricated at Promet's Jurong yard.

The second contract, again won through Promet's subsidiary Harbour Engineers, a joint venture with a Sharjah firm, will see the second dredging of Sharjah Lagoon situated about 80 kilometers from Dubai and the first stage of dredging at Al-Hamriyah Port. Sharjah Lagoon has been earmarked to accommodate pleasure craft. About 1.5 million cubic meters of very hard cemented rock, sand, and dredged materials will be deposited up to four kilometers inshore for the reclamation of low-lying areas in Central Sharjah in this project.

Like the first contract, the new project will require the use of a 24-inch, dual-pump hydraulic cutter suction dredge (shown above) built specially for the earlier project to cope with site conditions in Sharjah Creek. Promet will again fabricate two kilometers of dredge pipes to be towed to Sharjah, and about 80 engineers, surveyors, and workers have been assigned to work on the job. Work on the second contract is expected to begin in September and is scheduled to be completed by the same time next year.

**Diplomatic Marine Named Marine Distributor For Galvicon**

Kenco Division, Southern Coatings & Chemical Company, has appointed Diplomatic Marine, Inc. as their marine distributor for "Galvicon" brand Cold Galvanizing Compound.

Applied cold, Galvicon provides cathodic protection equal to that of hot-dip galvanized metal, thus achieving excellent rust and corrosion control.

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**Gene Facey Promoted To Managing Director Of International Drilling**

The Offshore Company, Houston, Texas, has announced that Gene Facey has been promoted to the position of managing director of International Drilling Company, Ltd., a wholly owned subsidiary of The Offshore Company engaged in international contract

drilling of oil and gas wells, and located in London.

Mr. Facey was employed by a major oil company and involved in the design and construction of offshore drilling rigs before joining The Offshore Company in 1972. Since 1977, he has been The Offshore Company's manager of construction.

During his career with The Offshore Company, his responsibilities

have included participation in every type of drilling rig design and construction conducted by the company. Mr. Facey has also had field operational responsibility for major drilling rig modifications, repairs, salvages and mobilizations, and extensive international travel related to sales and negotiation of contracts.

The Offshore Company is a wholly owned subsidiary of

Southern Natural Resources, Inc., which owns various other natural resources and energy-related businesses.

**Bremerton Firm Awarded \$2.5-Million In Contracts**

Art Anderson Associates, Inc. of Bremerton, Wash., has been awarded two Navy contracts valued at \$2.5 million for the first year, with optional years bringing the probable total contract values to \$9 million over a three-year period. The contracts were awarded by Puget Sound Naval Shipyard, and provide design engineering support services and technical documentation support for vessels assigned to U.S. Naval activities in Bremerton for overhaul.

Established in 1957, Art Anderson Associates is a fully integrated firm providing naval and commercial clients with preliminary, contract, and detail design services as well as cost estimating, materials requisition, technical documentation, computer services, and combat systems integration support.

Recent company projects have included the engineering design for the refurbishment of the 50-year-old Washington State Steel/Electric Class ferries; technical documentation support for Philadelphia Naval Shipyard; production design support for the renovation of the Alaska State Ferry M/V Taku; and the facilities design for the Trident Refit Facility at Bangor, Wash., done for the Electric Boat Division of General Dynamics Corporation.

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When young W.D. Haden hitched up a team of mules and began towing vessels up the bayous above Galveston Bay, people said he was daring. Ambitious. Enterprising.

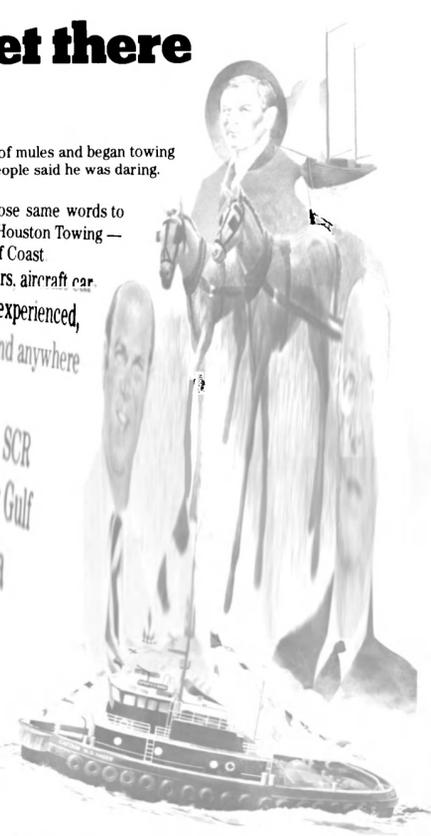
One hundred years later people still use those same words to describe the Haden family products. And Bay-Houston Towing — now the largest harbor towing fleet on the Gulf Coast.

Today our tug fleet services tankers, freighters, aircraft carriers, and offshore drilling platforms. We offer experienced, expert service. And the newest capabilities found anywhere on the Gulf Coast.

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**Liberty Bell Corrosion Course Scheduled For Philadelphia, Sept. 28-30**

The 19th Annual Liberty Bell Corrosion Course, cosponsored by the National Association of Corrosion Engineers (NACE) and the Engineers' Club of Philadelphia, will be held September 28-30, 1981, at the Marriott Hotel, Philadelphia, Pa.

The program for the 1981 conference includes a marine seminar. The seminar will provide a broad overview of changes taking place in the marine industry, including productivity improvements in ship construction, impact of regulations.

**Raytheon's 'Sub Sig II'  
To Provide Sea Trial  
Support For Electric Boat**

Contractor sea trials of submarines built by General Dynamics' Electric Boat Division, Groton, Conn., will be supported by Raytheon Company's research vessel Sub Sig II under terms of a charter signed recently by the two firms.

The vessel, owned and operated by Raytheon's Submarine Signal Division, Portsmouth, R.I., will provide positive keeping, communications, and other on-site services required to test and evaluate underway performance of new attack and ballistic missile submarines prior to their acceptance by the Navy. The renewable one-year agreement also requires performance of similar services for other submarine builders if requested by the Navy.

The position of a submarine during submerged maneuvers will be maintained continuously by a Raytheon DE1167 sonar system, designed and built at Portsmouth for small ASW patrol ships. Comprehensive sea tests of the system and various navigation and communications equipment were conducted in the 118-foot Sub Sig II to demonstrate a total capability to satisfy the highly precise data requirements of the trials.

**Q&A Booklets On Valves  
And Cylinder Wall Pitting  
Offered By Caterpillar**

Two new pocket-sized booklets are now available from Caterpillar. One answers questions about engine valves and gives tips on getting longer valve life. The second booklet discusses the cause and effect of cylinder wall pitting and how proper cooling system maintenance can prevent this problem.

To obtain free copies of Questions and Answers about Engine Valves (PEDP0001) and Questions and Answers about Cylinder Wall Pitting (PEDP1101),

Write 58 on Reader Service Card

**Lockheed Shipbuilding  
Awards LSD-41 Contract  
To J.J. Henry Co., Inc.**

The J.J. Henry Co., Inc. of New York, has been selected by the Lockheed Shipbuilding and Construction Co. of Seattle, Wash., to develop detailed engineering and construction drawings for the LSD-41, the first in a new class of Dock Landing Ships for the U.S. Navy. The J.J. Henry Co. had previously provided engineering support to Lockheed during the Ship System Design Support phase (SSDS), and designed the Land Based Test Site (LBTS) to test the vessel's prospective main propulsion system. Construction of the Land Based Test Site is currently underway at the

Naval Ship Engineering Station (NAVSES) located in the Philadelphia Naval Shipyard.

The LSD-41 class vessels are large amphibious support ships designed to transport combat-equipped and battle-ready U.S. Marines to designated trouble spots throughout the world. Each ship will be equipped with four air cushion landing craft (LCAC) to deliver combat troops and heavy equipment onto or over the beaches to tactical assault

points ashore. Designed for flexibility, the LSDs can also land troops and equipment by helicopter and conventional landing craft if warranted by existing circumstances.

Engineering work on the program is being performed at the J.J. Henry Co.'s Moorestown, N.J., Production Division Headquarters, under the direction of Robert McFadden, assistant vice president and director of marine engineering, who is the program

manager for J.J. Henry. In addition to being one of the largest contracts ever awarded to the company, the program is unique in that the J.J. Henry Co. is making extensive use of its recently installed computer assisted design equipment, including the SPADES system of N/C lofting.

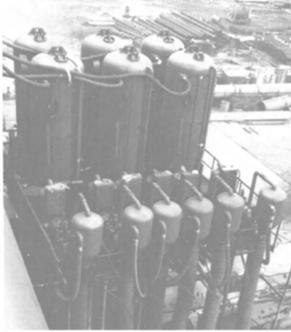
Previous successful projects engaged in by Lockheed and the J.J. Henry Co. include the large and powerful 400-foot USCG icebreakers of the Polar Star class.



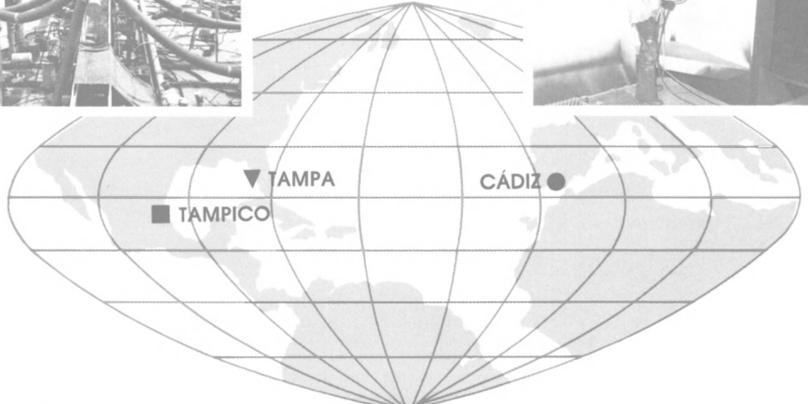
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& COATING FACILITIES**



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Modern equipment achieves blasting and coating rates for 2-coat epoxy on normal surfaces in the range of 2,000 square meters (20,000 sq. ft.) per day using experienced American and Hispanic personnel.



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- Astilleros Del Golfo, S.A., Tampico, Mexico
- Aplicadores Reunidos Del Golfo De Cadiz, S.A., Cadiz, Spain.



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DIPLOMATE IN NAVAL ARCHITECTURE AND MARINE ENGINEERING

## Marine coatings & corrosion control

Spurred by the tremendous rise in all marine costs during the past eight years, many suppliers of marine paint have developed sophisticated antifouling coatings to keep a ship's hull smooth and free of marine organisms, thereby reducing fuel consumption. Other developments include improved anticorrosion formulations and solvent-free coatings that enhance safety in the shipyards and aboard vessels. Manufacturers of equipment used for hull and steel cleaning as well as

corrosion fighting products such as anodes have also made valuable cost-reducing contributions in the past few years.

We asked the major manufacturers of corrosion control products and equipment to tell us about their latest developments and ongoing research programs, as well as their proven products. The following review on marine coatings and corrosion control is based on the replies we had received as we went to press.

### AMERON

Ameron of Monterey Park, Calif. has announced the development of several cost-effective marine coatings systems. Ship hull smoothness is produced with a cost-effective, permanent high-build primer, followed by application of one of a series of new, advanced high-performance antifouling coatings. These antifouling coatings reduce fuel consumption by providing long-term, broad spectrum fouling control and drag reduction.

The key to these products is a patented, controlled-release polymer used in several unique, proprietary compositions. Ameron's controlled-release organotin polymer allows for a variety of formulation possibilities. Antifouling systems range from an innovative, inorganic coating that combines corrosion and fouling control, to a polymeric co-resin AF system that provides controlled-release toxin and a durable, micro-smooth surface. These new systems provide similar protection against fouling, even for vessels tied up at a dock for several months.

Amercoat® 2162 provides both corrosion and antifouling protection in one coating. Tests have shown both fouling and corrosion control for periods ranging from 48 to 60 months with only two coats (6 mils DFT) over blasted steel. This system is durable and, on aging, micro-smoothness remains essentially unchanged.

Amercoat 2161 is a semi-abla-

tive, inorganic AF coating suitable for use over inorganic zinc primers.

Amercoat 2161 functions by using Ameron's patented, controlled-release polymer and proprietary inorganic fillers, providing superior AF performance and drag reduction. Its inorganic zinc undercoat insures long-term corrosion resistance.

For maintenance and repair work where sandblasting to bare metal is not scheduled, Amercoat 2409 is a durable, broad spectrum, polymer-based antifouling coating. This product provides constant delivery of toxicant for fouling control while keeping excessive film thickness loss of the coating in check. Long durability promotes continuous micro-smoothness to help lower drag resistance for extended periods, while also performing well under static conditions.

For more information on Ameron products,

Write 11 on Reader Service Card

### ASTILLEROS DEL GOLFO

Astilleros Del Golfo S.A., located on a 25-acre site in Madero/Tampico, Mexico, is unusual in that it was designed and constructed solely to perform grit blast and tank coating operations, though pierside and engine repairs are also carried out, and there are plans to construct a

graving dock to permit external hull blasting and coating. Wesley D. Wheeler Associates, Ltd. of New York City is ADG's exclusive representative for the United States and other areas not presently covered by agents.

The highly automated blasting facility is based on a closed system supplied by C.A.B. of Houston; some special components were designed by ADG and built by its own fabricators. Grit is supplied from hopper cars on a rail siding to the yard's two huge, top-loading silos, each of which holds 1,000 tons of grit. After screening and loading into the silos, the grit automatically drops to the lower pressure chambers.

From there the grit is fed to eight blasting lines at the base of each silo via a mixing valve that meters it into the compressed air. The air is supplied from a bank of large compressors via C.A.B. coolers that remove oil and water. Eight pipelines from each silo take the air/grit mixture to the ship at the pier. On deck, the blast hoses are coupled into the supply lines.

Sixteen blast nozzles are operated on two 12-hour shifts per day, seven days a week. Blast pressure at the nozzles is about 100-110 pounds per square inch, and white to near white blast is accomplished at a rate of 70-90 square feet per nozzle per hour.

Using dehumidified air for ventilation, tanks are blasted, grit blasted, spot blasted when necessary, then grit swept to brighten the steel prior to final cleaning, vacuuming, and coating.

For more information and a free brochure on Astilleros Del Golfo,

Write 12 on Reader Service Card

### ATLANTIC SANDBLASTING

Atlantic Sandblasting & Coatings, Inc. of Tampa, Fla. now has available an 1,800-foot piersite capable of sandblasting and coating

of internal tanks, decks, etc. Light drafts of 26 feet can be accommodated at the facility.

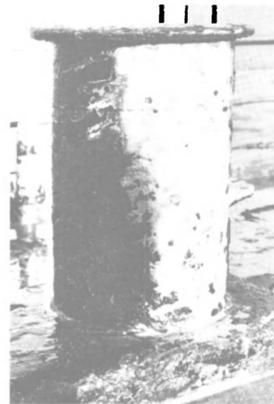
Atlantic is currently installing a 7,000-square-foot office and warehouse complex. Included are the most modern compressed air and grit-handling systems available.

More than 5 acres of land area is available for other trades. It is anticipated that steel work will be tied in with the sandblasting and coating to offer vessel owners complete retrofitting capabilities.

Atlantic Sandblasting has been in the marine coating business for more than 20 years and has never had a coating failure or delayed a vessel from schedule.

For a free capabilities brochure, Write 13 on Reader Service Card

### BUTTERWORTH/ LIQUA-BLASTER



Butterworth Systems' Marine Liqua-Blaster® unit for shipboard cleaning and descaling uses ultra-high-pressure (10,000 psi) water blasting to remove rust and provide "white metal" surfaces for painting. Precision work is now

(continued on page 42)

# Intersmooth

# SPC

Self polishing copolymer A/F

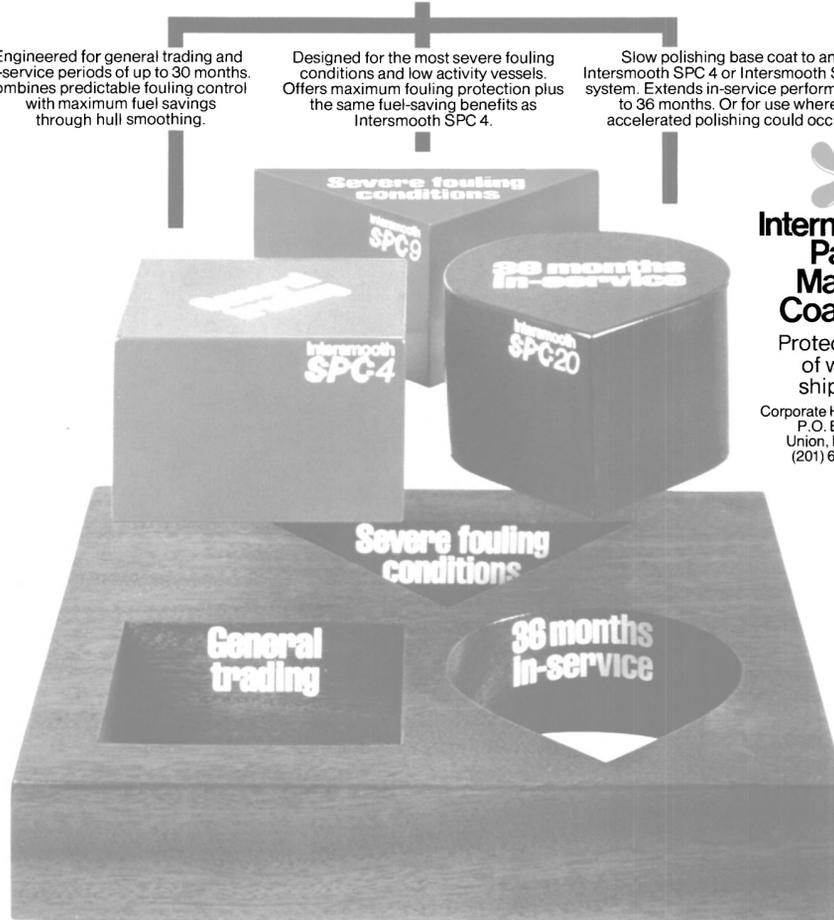
## Now a family with one to fit your operation and cut your costs

The monitored performance of antifoulings by International Dataplan has clearly shown that no single product can meet the needs of every ship operator. International Paint's unique experience in marine biology, copolymer technology, hull roughness, ship performance and ship operating costs, has brought a new dimension to the economics of ship operation—the *Intersmooth SPC family*.

Engineered for general trading and in-service periods of up to 30 months. Combines predictable fouling control with maximum fuel savings through hull smoothing.

Designed for the most severe fouling conditions and low activity vessels. Offers maximum fouling protection plus the same fuel-saving benefits as Intersmooth SPC 4.

Slow polishing base coat to an Intersmooth SPC 4 or Intersmooth SPC 9 system. Extends in-service performance to 36 months. Or for use where accelerated polishing could occur.



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### Marine Coatings & Corrosion Control —Butterworth

(continued from page 40)  
possible, thanks to the variety of nozzles available, all of which are hand-changeable.

Generally, it takes about 15 minutes of use before a beginner can be called proficient with the gun of the Liqua-Blaster. Having

learned how to use the tool the operator can do an outstanding job of water-only cleaning at a rate of about 3 square feet per minute.

For a more thorough white metal cleaning, sand is injected into the water stream. The use of sand, wet or dry, can cause sparking; therefore, sand should only be used in non-explosive environments. Because of the high velocity of the water jet the sand

impacts the surface at a greater force than in dry sandblasting. As a result, it provides faster cleaning and uses less sand. As no dust is generated, respirators are not needed, and clean-up is a good deal easier.

An added benefit accrues with the Marine Liqua-Blaster unit in that a rust-inhibiting agent can be automatically injected into the water jet to protect cleaned surfaces against oxidation. The in-

hibitor can be injected along with the sand, or during a final water-only clean-up operation. The special rust inhibitors will not interfere with subsequent painting.

The Liqua-Blaster is available on a skid for deck mounting or with wheels, and has an eyebolt at the balance point for hoisting. A typical system also includes two guns, all necessary hoses and fittings, and the Abras-I-Jector® sand injector accessory, and safety apparel for four men.

For more information on the Liqua-Blaster unit,  
Write 14 on Reader Service Card

### BUTTERWORTH/ SCAMP



Butterworth Systems' Scamp® unit cleans hulls underwater, reducing fuel costs by reactivating antifouling paints. The amounts of fuel wasted in carrying unwanted barnacles, seagrass, and other forms of marine life is mind-boggling. With the very high cost of fuel today, shipowners throughout the world are cutting costs with Scamp. Scamp underwater hull cleaning programs are available worldwide. It is estimated "Free World" trading ships use some 126 million tons of fuel each year. A savings of at least 6 percent would be worth looking into. Six percent represents 7½ million tons. This savings could be realized by periodic underwater hull cleanings. With bunker fuel prices over \$215 per ton, this would represent a savings for the "Free World" fleet of more than \$1.6 billion.

The Scamp underwater hull-cleaning machine is a set of three special rotating brushes mounted in a saucer-shaped unit in the center of which is a unique clamping impeller that holds the machine to the hull surface with a force of 1,000 pounds. The machine is controlled by professional scuba divers, or remotely from a workboat. In use, the Scamp unit is controlled to advance, stop, or reverse, or hold a parallel line of motion as it cleans a five-foot-wide swath. Because the sides, not the tips of the cleaning bristles are used, a scything action is achieved that will not harm protective coatings.

The Scamp machine is hoisted  
(continued on page 44)

## DuPont's high-performance Marine Finishes help you fight corrosion...worldwide.



We know what we are talking about, because DuPont Marine Finishes are backed by more than 40 years of experience on our own fleet of blue-water ships, barges and river craft. And no matter where in the world you do marine painting, you'll find a nearby source of DuPont high-performance Marine Finishes. With regional Marine Finishes headquarters in Singapore, Mechelen, Belgium, and Wilmington, Delaware, another 30 countries have DuPont subsidiaries and affiliates.

DuPont Marine Finishes, designed to protect *and* to last in the toughest environments, include:

**GANICIN® Zinc-rich Coatings**  
One- and two-component primers for sand-blasted steel.

**IMRON® Regular and High-build Polyurethane Enamels**  
Topcoats for corrosive and severe environments.

**CORLAR® Dual-build Epoxy Enamels**  
Two-component epoxy resin finishes.

**IMLAR®-2 High-build Vinyl Coatings**  
High solids, low cost/sq. ft.

**DULCIX® Alkyd Finishes**  
Primers and topcoats for long-term metal protection.

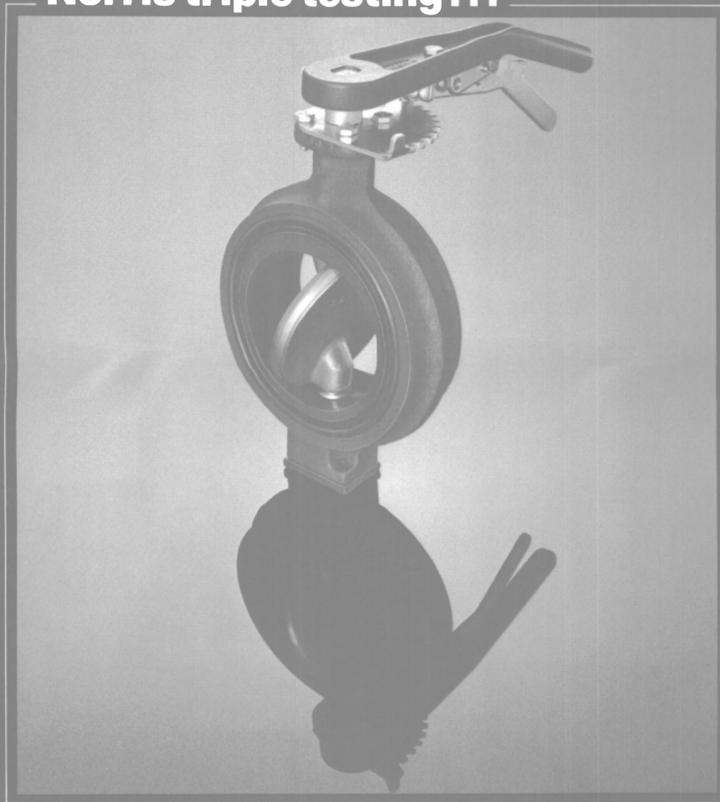
DuPont Marine Finishes also include tank lining coatings, bottom primers and anti-fouling paints, boot-topping paints, aluminum paints, thinners and other additives.

For further information and a color card, write on your letterhead to DuPont Company, Marine Finishes, Room X38616, Wilmington, DE 19898.



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## Norris triple testing ...



## Every valve shapes up, or it doesn't ship out.

Every Norris butterfly valve you install is leak free to start with. Each Norris valve is tested three ways before it is shipped: it is hydrostatically tested to 110% of rated working pressure upstream and downstream with the disc closed to detect leaks through the valve bore, at flange seals and around shafts. Leakage between seat and body is detected by inspection with the shaft retention screw removed. Each valve is shell tested with the disc open at 150% of

rating. A Norris valve will never leave our plant if it fails to meet these positive shut-off standards.

Of course, the ultimate test of any valve is its dependable service life on-stream. Norris butterfly valves meet the test of time, too.

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**Marine Coatings & Corrosion Control**  
—Butterworth

(continued from page 42)  
into and out of the water by an accompanying workboat, which provides operating power. And as the time required to perform a complete hull cleaning generally runs 4 to 16 hours, depending on vessel size and degree of fouling, the cleaning operation can usu-

ally be conducted during loading or discharge, with little or no time loss due to the hull cleaning itself.

The Ship Research Institute of Norway has led the development of antifouling coatings designed to be reactivated at 12-month intervals using Scamp machines with specially designed brushes. The antifouling coating is significantly thicker than ordinary coatings, and leeches its poison-

ous cuprous oxide into the sea. After about 12 months, an inactive layer develops at the top surface, reducing the leeching rate. When this happens and a color change occurs, it indicates that Scamp machine treatment is called for, and reactivation is easily achieved.

For more information on the Scamp machine and locations of worldwide cleaning stations, Write 15 on Reader Service Card

**CAMREX**

As a major supplier of specialized marine coatings Camrex Limited of Sunderland, England, is constantly trying to strengthen its "armory" of paint systems, and new systems are constantly being developed and evaluated. These new coatings strengthen the Camrex product range with particular reference to the marine field, a major business area for the company. Some of the areas within the marine field where Camrex has particular expertise are described below, together with brief descriptions of coatings developed for each.

Chemical tank linings is an area in which Camrex has a great deal of experience, the trade name Camkote known worldwide to be synonymous with high-performance coatings. A new addition to Camrex's line is Camkote EP, a high-performance, two-pack epoxy coating formulated to provide outstanding resistance to a wide range of chemicals, solvents, and oils. This product is intended for general tank lining use, including the parcel tanker trade, where the wide variety of aggressive cargoes carried can severely damage less sophisticated coatings. Camkote EP has been designed to avoid any such problems and provide the shipper with a coating that will allow carriage of a wide cargo range.

The importance of providing adequate corrosion protection for the often neglected area of ballast tank linings has long been realized at Camrex. As such, several coating types have been developed. These include pitch epoxies (D.T. Kote), pitch polyurethanes (NOP 6U and 6L), plasticized pitch compositions, solvent-free coatings, and the internationally accepted NOP range.

An interesting development in this field has been progress towards a light-colored ballast coating. The corrosion protection aspect of this system is also under investigation. The current trend is ballast coatings that are both less toxic and pose less of a potential fire hazard. Accordingly, the research work on water-based coatings has been intensified as a major area for new systems.

Ablative antifouling represent the culmination of many decades of work aimed at providing a constant biocide output from the paint surface. This is achieved by seawater action upon the polymer surface layers. Thus these surface layers are constantly renewed, exposing fresh biocide. Camrex C-Pol incorporates the traditional biocides combined with new organo-metallic polymers, providing an antifouling paint with good antifouling properties in both static and dynamic situations.

The above product areas are indicative of the wide range of aggressive conditions under which



**Here's how five shipbuilders and owners fight corrosion with Ameron marine coatings.**

Ameron marine coatings meet quick turnaround requirements of tuna fishing vessel owners with high-performance coatings like Dimetcote® E-Z II, a new generation inorganic zinc in single-package formulation which reduces application labor costs and is easily applied.

Commercial vessels around the world depend on Ameron marine coatings like Amercoat® 70, a controlled-release flaked copper coating with economical antifouling protection benefits.

Barges protected by exterior Dimetcote/Amercoat marine



coatings are also protected by interior tank lining systems like Amercoat 64/386. This epoxy system resists a broad range of chemicals and solvents.

The world's first fleet of 326,000 DWT Very Large Crude

Carriers depended on the world's leading inorganic zinc primer, Dimetcote 3, as the foundation for an effective marine coatings system which produced dramatic economic benefits.

Find out how Ameron marine coatings can help you fight corrosion effectively. Write Ameron Protective Coatings Division, 201 North Berry Street, Brea, California 92621 for information or call (714) 529-1951.



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Maritime Reporter/Engineering News

Camrex coatings are required to operate. Many years of both technical and practical expertise has enabled Camrex to perfect these systems which, allied with the close technical supervision that is a feature of all Camrex contracts, insures optimum system performance.

For additional data on Camrex products,  
Write 16 on Reader Service Card

### CARBOLINE

Carboline Company of St. Louis has compiled data covering more than 30 years of successful experience in the protective coatings field. Recommended Carboline Marine Division coating systems are based on laboratory research and technology combined with extensive ship and shipyard background.

Since the company was founded in 1946, it has built an enviable record in coating research and development, and has developed specialized coating systems suited to the requirements of the marine industry. Many systems are based on Carbo Zinc® 11 and Carbomastic® 15 as prime coats.

In many cases, extensive surface preparation for maintenance coatings application has become very expensive. Carboline recognized this problem and has developed a marine system based on Carbomastic 15, a self-priming, high-build, aluminum epoxy mastic that has excellent adhesion to rusted steel and most aged paints. This system is said to provide better corrosion resistance and performance than conventional coal tars and epoxies over minimum surface preparations.

For maintenance work, a sweep blast of the existing coatings to tightly bonded material is an acceptable surface preparation. A single maintenance coat of Carbomastic 15 has required a minimum of touch-up since the system was first applied (six years to date).

The use of an overall coat of Carbomastic 15 results in a smooth, uniform surface appearance that helps eliminate the checkerboard effect often noted in other systems that are partially touched up in drydock at two-year intervals. It has excellent flexibility and weathering properties, and normally requires no topcoat. However, Carbomastic 15 may be topcoated with most antifouling, epoxies, polyurethanes, chlorinated rubbers, and acrylics if desired.

Carboline recommends the use of either Carbo Zinc 11, an inorganic zinc, or Phenoline 373®, a modified phenolic for marine tank lining applications. Using a combination of tanks coated with these two systems, the Carboline Company feels that a maximum number of cargoes can be carried with a maximum amount of versatility and flexibility per vessel. Phenoline has excellent chem-

ical resistance and is an effective and economical lining system for steel tanks carrying dilute acids, caustic soda, salt, or solvents, and is also recommended for tanks carrying wet or dry food products. It is a thermosetting material.

Carboline's experience does not stop with effective corrosion control systems. Knowledge of proper recommendations for the serv-

ice, good application techniques, and dependable servicing are strong assets in assuring customer satisfaction. The Technical Service Department, working in conjunction with the Marine Division, makes certain maximum service life is obtained.

In the marine industry especially, the availability of worldwide servicing and supply is essential. Trained Carboline repre-

sentatives are located throughout the United States, Canada, Europe, and more than 25 foreign countries. Their experience provides the backup for the specifier's judgment when recommending corrosion resistant coatings systems.

For more information on Carboline products,  
Write 17 on Reader Service Card  
(continued on page 46)

**A 10,000-psi jet of water promises to revolutionize routine on-board maintenance... especially rust and scale removal of surfaces to be painted.**

Butterworth Systems now offers a modern alternative to the age-old chipping hammer. It's their MARINE LIQUA-BLASTER®



Diesel powered pump of a MARINE LIQUA-BLASTER onboard a vessel.

ultra-high pressure water-blasting equipment. Especially developed for shipboard use at sea, the MARINE LIQUA-BLASTER unit uses a diesel or electric powered pump to generate a 10,000-psi jet of water that is directed by a fail-safe, hand-held gun at the surface being descaled.

#### "White-metal" cleaning.

On a badly rusted surface, "water only" blasting removes scale and debris, leaving a surface that is acceptable for standard maintenance painting. If a moderate amount of sand is automatically added to the water jet, a surface can be "white-metal" cleaned more effectively and more efficiently than it would be with dry-sand blasting in a shipyard. With the MARINE LIQUA-BLASTER unit, a rust inhibitor can be added to protect the "white-metal" surface against oxidation before painting.

## Introducing the Butterworth Systems MARINE LIQUA-BLASTER® SHIP MAINTENANCE SYSTEM.



poop deck. The job was done as routine maintenance with interruptions for bad weather and all-hands tasks. In a little over two weeks the poop deck was "white-metal" cleaned and freshly painted.

Doing the same job in a shipyard would have cost \$13,750 at \$25 per square meter not including the incremental lay up time to accomplish this task.



Heavily rusted deck (below), after water blasting (left), and "white-metal clean after water-sand blasting (right)."

#### Get all the facts.

For full details and a copy of an eight-page report, "Shipboard Cleaning and Descaling with Ultra-high Pressure Water Blasting", write or call today.



### Butterworth Systems

**BUTTERWORTH SYSTEMS INC.**  
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Telex: 136434

**BUTTERWORTH SYSTEMS (UK) LTD.**  
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Croydon CR9 4NX, England  
Phone: 01-684-4049  
Telex: 946524

**PARTEK CORPORATION OF HOUSTON**  
3721 Lapas Drive  
Houston, Texas 77023 USA  
Telephone: (713) 644-3636  
Telex: 762199

#### Better than dry-sand blasting.

Because of the high velocity of the water/sand jet, the sand impacts a rusted surface with a much greater force than with regular dry-sand blasting. The end result is faster cleaning using less sand.

Sand can cause sparking, so it should only be used in non-explosive environments.

#### Other shipboard cleaning.

In addition to descaling rusted surfaces, a MARINE LIQUA-BLASTER unit can be used for a number of

other on-board cleaning jobs. These include cleaning condenser and boiler tubes, oil spray from machinery, galley grease filters, clogged ports, and the like. For these jobs, as well as rusted surfaces, a variety of guns, lances, round and fan jet nozzles are available.

#### Proven on-board use.

The experience on a 69,742-DWT tanker is typical of other vessels that have used MARINE LIQUA-BLASTER equipment. Here, it was first used to clean a badly rusted 550-square-meter

## Marine Coatings & Corrosion Control

(continued from page 45)

### CHESTERTON

A corrosion preventive protection system for shipping and other marine applications has been formulated by A.W. Chesterton Company of Stoneham, Mass. The six products in the system include three for above the water-

line and three others for engine room applications and when white metal finish sandblasting is a consideration.

Rust Transformer, Chesterton Universal Primer, and Urethane Enamels are designed for above the waterline use on a ship. Rust Transformer electrochemically transforms rust into a sound base for the Universal Primer. Transformer eliminates sandblasting and strong acid treatments, and

prevents further rusting with a passive, insoluble film.

Cold Galvanizing Compound, Heavy-Duty Rust Guard, and Chesterton Moisture Shield are appropriate for engine room applications when electrical relays may be endangered by exposure, or where white metal finish sandblasting is a possibility.

The Universal Primer and the Cold Galvanizing Compound resist corrosion and provide a firm

base for finish coatings to be applied. The Primer can be applied to any firm metal surface or over the Rust Transformer. Primer has withstood 2,500 hours of salt fog. The Compound is a 95 percent pure zinc coating that protects surfaces by sealing off water, moisture, and mild acids. It protects galvanically by sacrificing itself to oxidation instead of allowing the base metal to rust.

Long-term corrosion preventive protection is achieved with Urethane Enamels, which are virtually lead-free and have no lead compounds or photochemical solvents. No catalyst has to be added; this eliminates pot life problems and the possibility of errors in mixing.

Short-term corrosion preventive protection is achieved with Heavy-Duty Rust Guard and Moisture Shield. The first protects like a paint, but is more economical and can be removed easily with solvent type cleaners. A single application of the product protects against moisture, weather erosion, and contact marring. It can be applied without cleaning over firm rust.

Moisture Shield prevents rust and displaces moisture, creeping under dirt and oil. It leaves a barrier film that protects against salt spray, moisture, and other corrosives.

For more information and a free booklet on Chesterton products,

Write 18 on Reader Service Card

### DEVOE MARINE

Devoe Marine Coatings Company of Louisville, Ky., a division of Grow Group, Inc. has during the past two years started to market four new products. Bar-Rust is a water-based, hard permanent coating designed for application in ballast tanks, forepeak tanks, void spaces, or any area subject to rust where grit blasting is prohibited because of cost or location. It will adhere to tight rust and converts this rust to a passive state. This tough, flexible coating provides long-term protection against further rusting, abrasion, or damage.

Bar-Rust is a safe coating. It contains no organic solvents and will not burn. This coating can be readily applied over rust, old paints, and even damp surfaces using standard airless spray equipment, and can be touched up easily by brush or roller. The rapid dry, light colors, and minimal surface preparation make this product ideal for many marine applications.

Devran 234QC is a high-performance, corrosion control coating designed for exterior hulls, ballast tanks, offshore equipment, and inland waterway vessels. It is a high-solids, high-build coating that provides outstanding water resistance and durability in a one-coat application.

Two features make Devran 234QC desirable for marine ap-

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# Keep in touch.

ITT Mackay and North American Philips Corporation offer proven worldwide teleprinting-over-radio (TOR) communications for a fraction of the equipment cost of satellite-based systems.

Now you can add proven, economical TOR communications to link your ships at sea to any Telex terminal, anywhere in the world.

**TOR is Accurate**  
Modern error detection and correction equipment virtually eliminates transmission errors. Clear, accurate messages can be sent or received automatically.

**And Private**  
Messages directed to your ships are received and printed only by the vessels addressed. Information may be broadcast to all ships, or selectively sent to a single vessel.

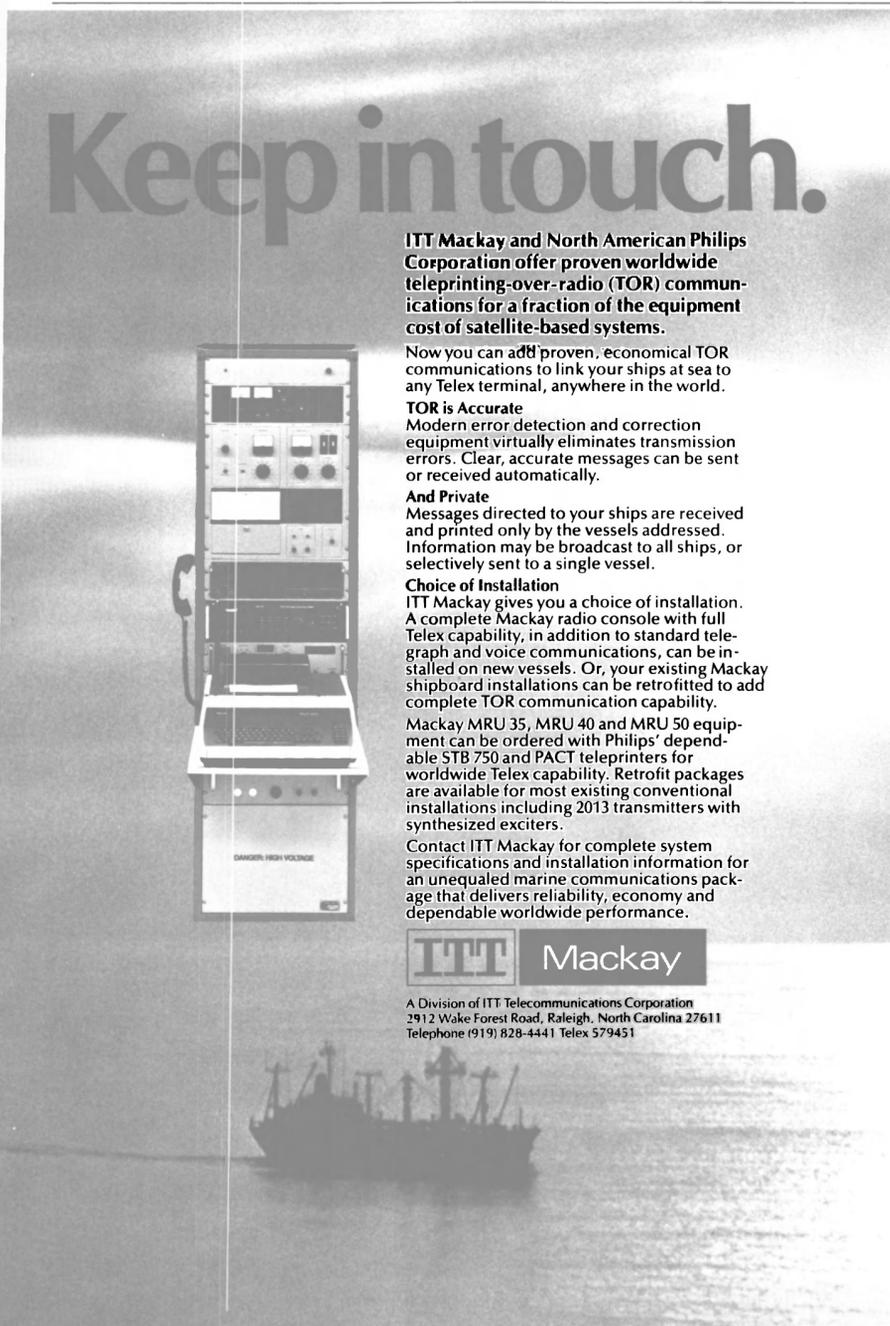
**Choice of Installation**  
ITT Mackay gives you a choice of installation. A complete Mackay radio console with full Telex capability, in addition to standard telegraph and voice communications, can be installed on new vessels. Or, your existing Mackay shipboard installations can be retrofitted to add complete TOR communication capability.

Mackay MRU 35, MRU 40 and MRU 50 equipment can be ordered with Philips' dependable STB 750 and PACT teleprinters for worldwide Telex capability. Retrofit packages are available for most existing conventional installations including 2013 transmitters with synthesized exciters.

Contact ITT Mackay for complete system specifications and installation information for an unequalled marine communications package that delivers reliability, economy and dependable worldwide performance.

**ITT Mackay**

A Division of ITT Telecommunications Corporation  
2912 Wake Forest Road, Raleigh, North Carolina 27611  
Telephone (919) 828-4441 Telex 579451



plications. The low temperature cure (it will cure below 0 C) allows shipyard and offshore painting to proceed throughout the winter months. And it has tolerance to many of the contaminants found in shipyards without hurting its almost permanent corrosion control protection.

Devoe's ABC Anti-Fouling systems provide complete fouling protection, and a smoothing effect that reduces fuel consumption. ABC-AF systems consist of contrasting red and blue coatings that slowly ablate away, thereby increasing hull smoothness and preventing attachment of fouling organisms. The high concentrations of cuprous oxide and optimum levels of organo tin compounds insure static protection while the ablatative smoothing action proceeds as the vessel is under way.

ABC-AF systems are compatible with all high-performance and chlorinated rubber bottom coatings in good condition. There are more than 70 major ships presently using the ABC-AF systems, operating in all seven seas.

Devflex I is a fire-retardant, water-based enamel designed for interior use. This product replaces the solvent-based chlorinated alkyd now in common use. It is safe during application because it contains no solvents or solvent fumes. It dries rapidly, thereby speeding up the painting operation. Devflex will withstand temperatures up to 2500 F.

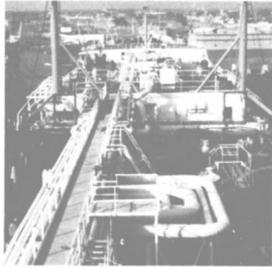
This new enamel is compatible with alkyd primers and old alkyd enamels. It is flexible and can be applied directly over insulation without cracking. A water-based primer is also available that will not rust bloom when applied over ferrous surfaces.

The outstanding color retention, scrub resistance, ease of tinting and application make Devflex an ideal product for Navy and passenger vessels requiring fire resistance for interior coatings.

For additional information on Devoe Marine coatings,  
Write 19 on Reader Service Card

### DU PONT

The Du Pont Company has been active in the marine maintenance and new construction



Topside piping system shown here was topcoated with Du Pont "Imron" polyurethane enamel.

painting field for more than 40 years. The company's high-performance coatings reflect its long experience in preventing corrosion at more than 100 Du Pont chemical plants. The coatings are also used on the company's large fleet of inland and oceangoing ships and barges.

This extensive experience in protecting marine steel has led to the development of a new Marine Maintenance Painting Serv-

ice that is now being test-marketed to shipowners. The service, similar in concept to the company's land-based Maintenance Painting Service, relieves owners of the total burden of maintenance painting. Under the program, owners sign a contract giving Du Pont responsibility for painting a ship or ships for a predetermined period of time, at an agreed-upon and guaranteed level of protection. All work is

supervised by Du Pont Marine Finishes specialists.

Another development in the Du Pont Marine Finishes business is expansion of operations to a worldwide marine market. The company is now dealing extensively with foreign-flag lines in maintenance, new construction, and conversion projects.

According to Robert A. Sprout, manager of Du Pont's Marine (continued on page 50)

## Evaluate your Marine Coating Supplier with this JOTUN B.C.P. CHECK LIST

- FULL LINE OF COATINGS SYSTEMS.  
Conventional and sophisticated.
- REACTIVATABLE ANTIFOULINGS.  
Seamaster and Seamate Antifoulings offer up to 5 years protection against fouling without drydocking.
- SELF POLISHING ANTIFOULING.  
Takata LLL Self Polishing was utilized by over 200 vessels worldwide in 1979. Its slow polishing rate and cuprous oxide toxicant are unique amongst today's similar coatings.
- UNDERWATER CURE ANTIFOULING.  
Floatmaster Long Life Antifouling cures underwater for fast turn round or wet docking.
- GLASS REINFORCED POLYESTER ONE COAT SYSTEM.  
Baltoflake can be applied up to 60 mils in one coat and offers years of superior protection against corrosion/abrasion.
- WORLDWIDE STOCK POINTS AND TECHNICAL SERVICE.  
Jotun Marine Coatings are manufactured to the same standard in 18 factories and stocked in over 200 locations worldwide. Technical Service by fully trained company inspectors is available in the world's major ports.
- HIGH VOLUME SOLIDS COATINGS.  
Get full value from every gallon of paint.
- FULL LINE OF MILITARY SPECIFICATION COATINGS.
- TROUBLE SHOOTING TECHNICAL DEPARTMENT.  
Specifications and solutions to your coating problems are just a phone call away.



### JOTUN B.C.P. MARINE COATINGS

Head Office: JOTUN-Baltimore Copper Paint  
840 Key Highway, Baltimore, Maryland 21230  
(301) 539-0045 Telex 8-7549

Gulf Office: JOTUN-Baltimore Copper Paint  
16416 Northchase Drive/Suite 130  
Houston, Texas 77060  
(713) 999-2897 Telex 8-7549

New York Office: JOTUN-Baltimore Copper Paint  
74 Trinity Place/Suite 402  
New York, N.Y. 10006  
(212) 962-6500 Telex 8-7549

FOR BALTOFLAKE  
BROCHURE MAIL TO:  
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Baltimore, MD 21230 U.S.A.

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POSITION \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_

MR

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



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

**\$9750**

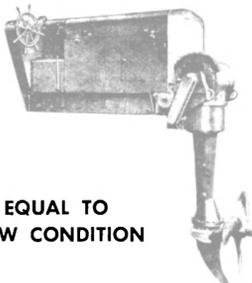
**LOUIS-ALLIS M.G. SETS  
2.5 KW 120 Volt Single Phase 60 Cycle Output  
120 Volt D.C. Input — 1800 RPM  
NEW - UNUSED EX - U.S.N.**



2½ KW—115 volts single phase A.C. output. GENERATOR: Type GNA—class 1G—Frame 28A—Form A—1800 RPM—5 KVA—2.5 KW 115 volts AC— 60 cycle —50% PF—43.4 amps. MOTOR: Louis Allis—Type GNA—Class E—Frame 25A—Form A—1800 RPM—115 volts DC—32 amps—shunt wound (with attached Ward-Leonard frequency regulator). Some control panels available.

CAN FURNISH WITH 230 VOLT DC INPUT

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



**EQUAL TO  
NEW CONDITION**

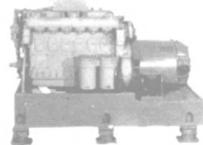
Equal-to-new-condition. Driven by GM 6-71 diesel—165 HP @ 1800 RPM—2-cycle—6 cylinders. Weight 9300 lbs—48" X 24" propeller. Unit shown with outboard shaft in running position. Distance from deck to bottom of skeg 89". 4 Units immediately available.

**250KW GM 12-V-71  
DIESEL GENERATOR SETS  
AIR START**



440/3/60/1800 — with free-standing switchgear. Generators manufactured by Electric Machinery Co. — E.M. Bemac — brushless — synchronized — keel cooled.

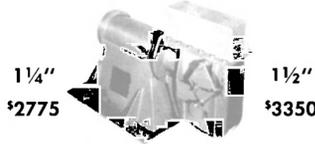
**60KW DIESEL GEN. SET  
DELCO GEN. — GM 6-71 DIESEL**



Delco 120 volt DC 500 amp stab. shunt 1200 RPM generator. Engine is GM 6-71 — heat exchanger cooled. Radiator shown is not included.

Reconditioned — Ready To Go.

**NEW BALANCED HEAD  
FAIRLEADS**



1 1/4"  
\$2775

1 1/2"  
\$3350

**20' ACCOMMODATION LADDER**



Aluminum — with feathering treads. 180° Swiveling upper platform. From ex-Alcoa SEAPROBE.

**NEW — UNUSED  
SPHERICAL  
MOORING  
BUOYS**

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

**CYLINDRICAL BUOYS**

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

**NAVY AXIAL FLOW FANS**



10,000 CFM—A10A4-W5. 20" ID. MOTOR: 7.5/3.3 HP—440/3/60 — 10.5/5.2 amps — 1750/1150 RPM. Reconditioned — 9 available.

ALSO 1 20,000 CFM FAN AVAILABLE

**100,000 LB. ALMON JOHNSON  
Constant Tension Mooring Winches**



In very good condition. Series 232 mooring & anchoring winches. Automatic self-tensioning. Wide range from 100,000 lb. line pull @ 10 FPM to 26,000 lbs. @ 400 FPM. Gypsy line pull @ 12,000 lbs. @ 25 FPM. Drum dedrivable through spiral jaw clutch for free spooling. Driven by 50 HP 230 VDC motor — Westinghouse CK — 575 RPM — ½ hour — 75°C rise — stab shunt — 181 amps. Max. RPM 1900 — Cutter-Hammer brake — 18" — type NM. Complete with magnetic control panel, resistor banks & remote control pedestal and mounted master switch.

**NEW — UNUSED  
LUBE OIL COOLERS  
344 SQ. FT.**



4" Oil inlet & outlet — 6" water inlet & outlet. Bronze heads and ¾" Cupro-Nickel tubes. Steel shell. Cooler overall length 8' 7" — distance between tube sheets 6' 5" — outside diameter of shell 17".

**WILSON-SNYDER 10 GPM 100 LB  
Small Auxiliary  
PORT BOILER FEED PUMP**



Steam driven reciprocating pump. Operating pressure 100 lbs. 10 GPM @ 100 LBS. Suitable for boilers to 150 HP. 1½" Suction — 1" discharge.

**GENERAL PURPOSE WINCH  
3500 LBS AT 200 FPM**



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



Main Office: (C)  
CABLE: BOSIRON—BAL

## HATCHES

### NEW UNUSED FLUSH HATCHES



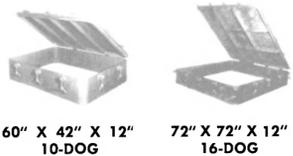
54' X 77"

14-Dog — operated from top side by T-key, with dogs marked to show open & closed positions.

24" X 30"

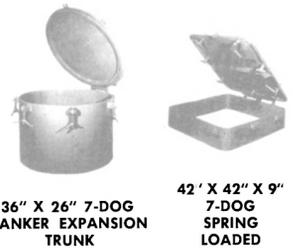
30" X 30"

4 Dogs on underside—topside flush, with T-Key openers.



60" X 42" X 12" 10-DOG

72" X 72" X 12" 16-DOG



36" X 26" 7-DOG TANKER EXPANSION TRUNK

42" X 42" X 9" 7-DOG SPRING LOADED

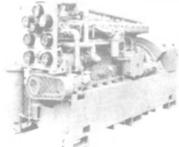
### NEW — UNUSED — IN ORIGINAL CRATE BOAT HANDLING AND GENERAL PURPOSE WINCH

EX U.S.N.



2500 lbs @ 125 FPM on one gypsy head or 1250 lbs @ 125 FPM simultaneously on each gypsy. MOTOR: 15 HP—230 volts DC—55 amps—GE. AVAILABLE: 1 Set mfg by Lakeshore with Reliance motor—1 set mfg by Ideal with GE motor. Complete with controls and disc brake.

## LST MACHINERY



### 100KW GBD-8 DIESEL GEN.

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



### GARDNER-DENVER BALLAST PUMP

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

### TAILSHAFTS

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



### GOULD FIRE & BILGE PUMP

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



### CLUTCH TIRE AIR COMPRESSOR

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



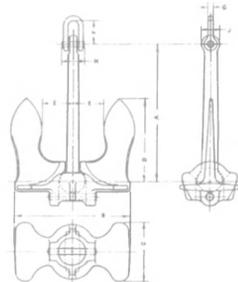
### COMBINATION LUBE OIL & SALT WATER COOLING PUMPS

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

## ANCHORS -- CHAIN

### DETACHABLE LINKS

### PEAR-SHAPED DETACHABLE LINKS



### LARGE BALDT-TYPE ANCHORS

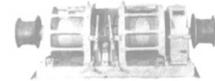
NEW — UNUSED LLOYD'S OR ABS CERTIF. 12000 LBS & 8000 LBS

### STEEL DUPLEX STRAINERS



2", 3" and 4" sizes. Manufactured by Kraissl.

### CARGO WINCH — NEW — UNUSED 2-DRUM 2-GYPSY DECLUTCHABLE

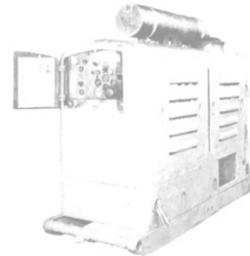


EX U.S.N.

DUTY: 7400 LBS @ 220 FPM. Mfg by Western Gear Works. With repair parts. Model CW50. Capacity of each drum 600 ft. of ¾" wire rope. MOTOR: 50 HP—230 VDC with control. 14" Cutler-Hammer brake control — 1 master switch — enclosed contactor panel & resistors.

### 30 KW GM 3-71 DIESEL GENERATOR SETS

with self-contained fuel tank and switchboard



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

# ON METALS CO.

RE ST. • BALTIMORE, MD. 21202

539-1900 Marine Dept.: (301) 752-1077  
ORE, MD. U.S.A. TWX 710-234-1637

**Marine Coatings & Corrosion Control**  
—DuPont

(continued from page 47)  
Finishes group, shipowners have begun to shy away from inexpensive, low-performance coatings. As investment in ships increases, according to Mr. Sprout, owners are now interested in high-performance coatings to protect their equipment.

Symptomatic of the trend is

heavy sales of Du Pont's Imron high-performance polyurethane coatings. Imron provides superior protection to salt, sun, and chemical exposures while retaining excellent gloss and overall good appearance. Many owners are using these finishes on virtually every piece of topside equipment.

Two recent U.S. Lines conversions are good examples. When the American Marketer and the American Merchant were con-

verted from breakbulk/container service to total container operations, their superstructures were sprayed with Imron polyurethane. The coating was chosen because heavy salt buildup requires frequent cleaning. Imron allows hosedowns for easy cleaning without damage.

Other products in the Du Pont Marine Finishes line are: Ganacin single- and dual-package, zinc-rich coatings; Corlar dual-build

epoxy enamels; and Dulux metal protective and machinery enamel.

For additional information on Du Pont Marine Finishes, Write 20 on Reader Service Card

**ENGELHARD**

Two Engelhard Industries, Union, N.J., systems are designed to provide corrosion protection (Capac)<sup>®</sup> and fouling control (Chloropac)<sup>®</sup>.

The Capac (Cathodic Protection Automatically Controlled) system is designed to provide reliable impressed current corrosion protection for vessels and offshore rigs. Capac is reported to extend the period between drydockings; reduce fuel costs; control corrosion under varying hull coatings, speeds and water conditions; and provide a permanent alternative to short-term sacrificial anodes and special coatings. The system had Maritime Regulatory Agency and Classification Society approval and can be installed on any type of vessel or rig. The system components are designed and manufactured by Engelhard.

The Chloropac system is designed to provide continuous fouling control through electrolytic hypochlorite generation from seawater. Chloropac is reported to eliminate erosion of heat exchangers; keep water boxes and sea chests clean; keep piping clean, reducing fouling induced erosion corrosion. Surface condensers maintain their heat transfer rates, thus reducing fuel consumption.

For further information on Engelhard's systems and products, Write 21 on Reader Service Card

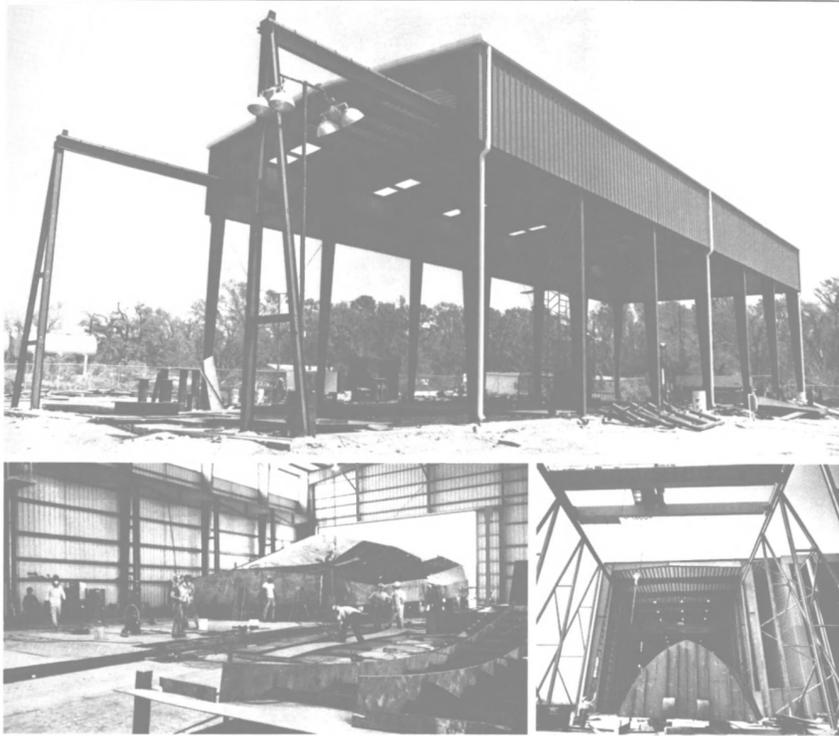
**ESGARD**

Esgard, Inc. of Lafayette, La., an international manufacturer and distributor of rust and corrosion preventive coatings, has developed a two-product integrated system that is said to provide lifetime protection for ballast tanks of ships, oil rigs, barges, and other marine vessels.

Both Bio-Kote and Bio-Gel are bio-degradable, practically non-toxic, and contain no petroleum oils or solvents. Bio-Gel is designed primarily for new construction and major reworking of such equipment. It is thoroughly compatible with Bio-Kote, which in turn provides long-term maintenance protection.

Until this new development, it was frequently necessary to undertake a costly removal of protective coatings applied during construction in order to apply a long-term coating. Bio-Gel may be simply sprayed on and in most cases Bio-Kote simply sprayed on or floatcoated later with no additional surface preparation.

Esgard will soon announce two additional product developments —Dri-Film and Enamel-Kote. Dri- (continued on page 52)



**Challenging projects are routine with us.**

Every day, architects, general contractors and building customers just like you turn to Mitchell building systems with their construction problems. And we've built a reputation for solving even the toughest ones...quickly, efficiently and economically.

With a Mitchell building you'll choose from a wide range of structural systems, all designed to meet your specific needs. Wide clear-span buildings give you large, unobstructed floor areas. Overhead material handling equipment can be easily installed.

Best of all, your Mitchell builder will have your building up and ready for production in weeks, not months.

If you've got a challenging project...look to your local Mitchell builder, he's listed in the Yellow Pages under Buildings - Metal. Or call (601) 328-6722 for immediate action.



**Mitchell Engineering Company**  
Division of The Ceco Corporation, Chicago

P.O. Box 72 Mount Pleasant, Iowa 52641 (319) 385-8001	P.O. Drawer 2387 Rocky Mount, North Carolina 27801 (919) 977-2131	P.O. Drawer 911 Columbus, Mississippi 39701 (601) 328-6722
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*slinemar*



There is no company better prepared to handle your needs. Depend on Sline Marine for all types of surface preparation and coatings of tanks; hulls; decks; barges; offshore production platforms and drilling rigs; engineering services and follow-up maintenance contracts.

If you would like to know more about how we can protect your investment write or call:

Sline Marine  
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Houston, Texas 77001  
(713) 675-3141  
TWX: 910-881-7054

*ine*

**Marine Coatings & Corrosion Control**  
—Esgard

(continued from page 50)

Film is a thin film preservative for indoor storage of metal and machined parts. It can be applied by dip, brush, or spray and dries quickly to a clear, non-tacky film. Because it is non-tacky, it does

not interfere with normal machining operations and can be easily removed with petroleum solvents. It can be topcoated with Esgard Equipment Kote for outdoor storage.

Enamel-Kote is a self-priming maintenance enamel. It features non-toxic rust inhibitors to insure corrosion protection without the use of lead, chromate, or

other environmentally undesirable components. Enamel-Kote comes ready to use in any color without thinning or two-component mixing. It is designed to be used on surfaces varying from buildings to equipment to pipelines.

For additional information on Esgard products,

Write 22 on Reader Service Card

**EUREKA**

Eureka Chemical Company of South San Francisco has supplied Fluid Film, Gel "B", to the maritime industry for more than a quarter of a century for the preservation of ballast tanks, voids, cofferdams, and other areas. This coating remains permanently soft and can be applied over tightly adhering rust and mil scale. Being a semi-fluid, it has no pinholes and does not develop cracks when the steel substrate flexes.

The long service life of Fluid Film has been documented by a recent ABSTECH report. As entry into ballast tanks is usually infrequent and traffic through these areas is minimal, the presence of a soft coating is not objectionable.

However, a firm coating for ladders and expansion trunks is desirable. Moreover, in some ships, particularly LNG carriers, ballast tanks must be entered on a regular basis for inspection purposes. In order to utilize the many advantages of Fluid Film throughout most of the tank and, at the same time provide a firm coating in those areas subject to frequent personnel traffic, Perma Film "BT" was developed.

Perma Film "BT" is a modified epoxy coating formulated for application without the necessity for sandblasting, only requiring a surface equivalent to Steel Structures Painting Council Specification SSPC-SP3-63, or better. This two-component coating is applied in two coats of 10 mils each wet (8 mils dry) to provide a total thickness of 16 mils DFT. Two colors, white and blue, are available, and either color may be used as the prime coat. The base coat should be allowed to dry a minimum of 8 hours and a maximum of 72 hours before the application of the second coat. If a non-skid surface is desired, 20-30 mesh Ottawa silica may be sprinkled on the top coat shortly after application.

Perma Film "BT" is compatible with Fluid Film, Gel "B". It is recommended that those areas be coated first where Perma Film "BT" is to be used, and a minimum of 7 days be allowed before re-entry into the tank and application of Fluid Film on vertical and overhead surfaces.

For additional information on Eureka products,

Write 23 on Reader Service Card

**FARBOIL**

The Farboil Company of Baltimore continues to keep pace with the rapid changes in the requirements for marine coatings. The conversion to high-build and high-solids coatings, the use of non-toxic pigments and fillers, and the increase required in flash points of coatings are only some of the developments that the company is currently pursuing.

Farboil has developed new zinc-rich coatings with long shelf life,

**EMPRESA NACIONAL BAZAN**

**More than two centuries in shipbuilding & related industries**

**TRADITIONAL QUALITY**

**MODERN IDEAS**

<p><b>NAVAL VESSELS</b></p> <p>Bazan. Our name does not tell the whole history since it is a modern name of an ancient Company which has been continuously working in Shipbuilding and related activities for over 200 years.</p>  <p>The primary activity of Bazan is the design and construction of naval vessels, mainly for the Spanish Navy, but many friendly countries overseas are witness of our reputation in this specialized field.</p> <p>Bazan also produces modern Shipborne weapons, enabling us to be the prime and sole contractor in all cases.</p> <p>Bazan, an appropriated answer to a good policy of buying.</p> 	<p><b>MERCHANT SHIPS REPAIRING</b></p> <p>Another important one of our activity lines is the Shipbuilding of merchant vessels. This activity was created in order to make better use of our production capacity and mainly because of our high technological development and quality level.</p>  <p>Shipyards and docks to build ships up to 230.000 TDW and suitable production resources.</p> <p>Repairing is also a significant activity line in all our three shipyards. Our high capability in this area stems from the high standards imposed by the repairing of naval vessels for the Spanish and Foreign friendly Navies. The merchant vessels we repair benefit from this extensive experience and the high quality that is required.</p> 	<p><b>ENGINES AND TURBINES</b></p> <p>In 1942 Cartagena Factory started the manufacturing of Krupp and Sulzer diesel engines. At the present time the activity is mainly concentrated in the production of M.A.N. and M.T.U. engines and Renk reduction gearboxes.</p>  <p>The actual production capacity is 250.000 BHP/year. Due to the requirements of the Navy works, the manufacturing of steam turbines was initiated at Ferrol Shipyard in 1910 under Parson's licence. Nowadays, and due to the new trends in the market of marine and shore power turbines. Bazan holds technical cooperation and licences with Westinghouse, Kawasaki, Mitsubishi, Kraftwerk Union, General Electric and Foster Wheeler.</p> <p>Bazan is also stepping into the gas turbine field for naval and shore use.</p> 
<p><b>HEAD OFFICE:</b></p> <p>55 CASTELLANA, MADRID-1, SPAIN PHONE 4415100 TELEX 27480 CABLE ADDRESS: BAZAN</p>	<p><b>SHIPYARDS AT:</b></p>	<p><b>EL FERROL DEL CAUDILLO</b> <b>CARTAGENA</b> <b>SAN FERNANDO (CADIZ)</b></p>

and has added to its line of one-package coating systems.

Farboil Ballastite® anti-corrosive coatings for ballast tanks have been modified to provide better corrosion resistance at lower cost, and the line has been broadened to meet requirements of most applications. There are now flotation products and sprayable types with soft or hard finishes.

An exclusive Farboil UV-resistant epoxy coating system has been developed that provides excellent outdoor durability compared with acrylic topcoats.

A program is currently under way to develop self-polishing organic antifoulants, and to achieve even greater service life for Farboil Sta Clean® antifoulants in order to increase the periods between repainting.

For additional information on Farboil products,

Write 24 on Reader Service Card

#### HEMPEL'S

Hempel's Marine Paints presents a new dimension in self-polishing antifouling, the choice of a system custom designed for the individual vessel. Because ships are different, individual ships need individual protective coating systems. Hempel's offers the choice of coating systems for whatever conditions may be encountered.

Hempel's Nautic Modules cover all types of trading patterns. From long sailing periods to short stays in port to frequent and long port calls, from normal to severe fouling conditions, Nautic Modules cover the situation. They are designed to cover a complete range of ship types, surface roughness, and drydocking interval.

Technically, Nautic Modules consist of Hempel's quality numbers 7680, 7685, 7687, 7690, 7695, and 7697 that, taken in various combinations, constitute a self-polishing antifouling in which both the potency and polishing rate are varied according to individual ship requirements. Self-polishing maintains the smoothness of new construction or reconditioning, extending the drydocking interval, and because Nautic Modules can be applied directly over the previous coat, drydocking costs are reduced. Additionally, varying the wear rate and toxicity offers the owner the flexibility of matching the effective life of Nautic Modules with a vessel's overall maintenance plan.

Hempel's Technical Service Department will work out the ideal Nautic protective scheme and participate in every stage of the application from negotiations with the yard to a written, illustrated report on the completed job.

Hempel's Multi-Mil System is an immediate and flexible solution to the problem of pit corrosion

in cargo tanks. Traditionally, pit corrosion has meant either plate replacement or repair by welding or abrasive blasting, followed by painting. These options are all slow, difficult to impossible to carry out during a voyage, and expensive.

The Multi-Mil System tank repair process is based on a combination of solvent-free epoxy mastics—Hempadur 3543 and Hemp-

el's Epoxy Filler 3531—and can be applied during a voyage. It does not require any large or complicated equipment, but fits right into the normal maintenance routine, offering an easy and economical solution to a complex problem.

For additional information on Hempel's Nautic Modules and Multi-Mil System,

Write 25 on Reader Service Card

#### HOOKER CHEMICALS

When a coating is used to protect ships of the U.S. Navy, it must meet stringent requirements. The Naval Sea Systems Command, which is responsible for preparing Navy coating specifications, recently approved the

(continued on page 54)

## PROVEN SUCCESS



Mobilzinc®

# UNI-PAK™

The unique inorganic zinc primer

UNI-PAK™ is the unique single-package inorganic zinc rich coating proven successful in the fight against corrosion in a wide range of marine and industrial applications.

UNI-PAK offers all the benefits of a 2-package material—ready-mixed in a single container—providing 82.5% metallic zinc in the dried film and excellent early water resistance. UNI-PAK inorganic zinc coating results in a smooth cured film, uniform in color and appearance which can be applied with either conventional or airless equipment.

For information about the success of UNI-PAK's performance—or to inquire about Mobil's complete line of high performance coatings—contact your Mobil representative today or write to Mobil Chemical, Maintenance and Marine Coatings Department, P.O. Box 250, Edison, N.J. 08817.

#### Mobil Chemical Company

MAINTENANCE & MARINE COATINGS DEPARTMENT  
Edison, New Jersey      Kankakee, Illinois  
Beaumont, Texas      Los Angeles area/Azusa, California  
Short Hills, New Jersey

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53

**Marine Coatings & Corrosion Control**  
**—Hooker Chemical**

(continued from page 53)

use of Hooker Chemical's Ferrophos enhancer as a replacement for up to 40 percent of the zinc pigment in zinc-rich primers.

The decision was made on results of long-term evaluations conducted by IMCO Laboratories,

Inc. of Buffalo, N.Y. According to E.A. Morgenstern of NSSC's Coatings and Corrosion Branch, the results "demonstrated that a 40 percent Ferrophos replacement of zinc pigment provides performance at least equivalent to primers with a total zinc pigment."

Ferrophos enhancer has been used commercially in zinc-rich coatings for more than seven years. Its use offers several ad-

vantages to both a paint manufacturer and an end user. The inert pigment is conductive and has the refractory properties of steel. As a result, it improves welding and cutting operations on pre-coated steel. It also provides excellent intercoat adhesion.

Of special interest to paint manufacturers, when Ferrophos is substituted for up to 40 percent of zinc in a coating system currently approved by the Navy,

retesting of the system is not required.

For additional information on Ferrophos,

**Write 26 on Reader Service Card**

**HYDE PRODUCTS**

Hyde Products, Inc. of Cleveland formulates and markets Zimmite® Mud Remover, a proven product that has been used by vessel owners and operators to remove tens of thousands of tons of mud, saving literally millions of dollars. Use of Zimmite is useful during the tank cleaning process to remove built-up mud before applying any coating. Continuous use of the product via an automatic injection system is said to keep ballast tanks clean and free of corrosive mud. This is especially important when using any float-coat material that relies on clean steel for adherence.

The Zimmite Automatic Injection System consists of a holding tank for the mud remover, pumps to inject the Zimmite into the ballast system, and an electrical control panel for the pumps. The holding tank may range in size from 100 to 300 gallons. All are equipped with a sight glass for a visual indication of tank level, a low-level alarm that lights on the control panel, fill and drain ports, and a cover to keep out foreign material.

Generally, two high-pressure diaphragm pumps are used in the Zimmite system. They can be mounted separately or directly on top of the holding tank. Zimmite tank suction is used to draw the Zimmite into the pumping system. The control panel consists of two push-button, lighted switches and one yellow warning light. Each switch controls one port or starboard feed pump (as marked). A light switch indicates proper operation. The yellow light is the low-level warning indicator.

System operation is simple. When the ballasting procedure begins, the operator starts one or both pumps, based on full treatment or just one side. The yellow warning light comes on when the level in the tank drops below 25 gallons. However, the pumps will run when this warning light is on; there should be enough chemical to complete the ballasting.

For more information and free literature on Zimmite,

**Write 27 on Reader Service Card**

**INTERNATIONAL PAINT**

In 1974, International Paint Marine Coatings met the challenge to combating rising fuel costs with the introduction of the Intersmooth SPC antifouling coating system. For the first time, a dynamic solution to an unsolved problem — control of fouling on underwater surfaces of ships —

**For the Broad of Beam**



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

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

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

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 A subsidiary of Ogden Corporation.

was now available. International Paint also resolved a problem that has persisted since the first ship was built, the progressive decline of speed versus power over time, due to physical roughening of the hull.

The unique characteristic of Intersmooth SPC antifouling is that its surface hydrolyzes when in contact with seawater, polishing as the water passes over the hull. Biocides, chemically and physically combined with the copolymer paint medium, are then released, protecting the surface from fouling. The rate at which Intersmooth SPC polishes is greater on peaks of physical roughness due to turbulence. The vessel's surface becomes smoother as it trades.

Intersmooth SPC performance extends far beyond the chemistry of the paint in the can. The key, as every shipowner knows, is experience. Monitored experience on more than 400 vessels controlled by nearly 200 owners—representing every major shipping interest in the world since 1974—has confirmed that Intersmooth SPC is the solution to: eliminating fouling penalties; improving vessel performance through hull smoothing; extending in-service periods; and maximizing operational revenues.

International Paint has not rested on its success. Fouling control achieved with Intersmooth SPC enabled operators to extend drydock intervals. But naturally, even longer periods at sea were desired.

Control of macroscopic fouling—weeds and barnacles—revealed that even slimes affect performance and must be controlled. Emphasized was the old problem of physical roughness, one costing money every day a ship remains at sea.

International embarked on a massive research program to understand and solve these newly recognized problems. International Dataplan was developed to quantitatively assess hull coatings' performance on all types of vessels, under all operating conditions. International Paint Marine Coatings worked in collaboration with universities and other research institutions to develop new techniques to measure and analyze hull roughness. Scientists at International Paint's worldwide Research Center then refined and tested new Intersmooth SPC formulations.

Intersmooth SPC keys on the concentration of biocides and their corresponding "release" rate. Products can be engineered with different characteristics to cope with different circumstances, ranging from the rate of biocide release in static conditions, to the rate of hull smoothing.

Accelerating experience at sea, in the drydock, and the laboratory, has enabled International to recognize that no singular prod-

uct can provide all the answers. As a result, the Intersmooth SPC Marine Coatings Family was created.

Intersmooth SPC-4 has the most extensive in-service track record within the Family. It was engineered for general trading conditions, for in-service periods of up to 30 months. It combines predictable fouling control with proven smoothing characteristics.

Intersmooth SPC-9 offers the same benefits of Intersmooth SPC-4, while specially designed for more severe fouling environments and low activity vessels. It has been used extensively for ships operating from Japan, where fouling is severe, and for ships operating with repeated idle periods (especially on coastal routes), such as ferries.

Intersmooth SPC-20 is the new-

est member of the SPC Family. It polishes more slowly than the other products, and used in combination with the SPC-4 or SPC-9 system, allows extended in-service periods beyond 30 months. It is also recommended where accelerated polishing might occur.

For additional information on International Paint's products, Write 28 on Reader Service Card (continued on page 56)

## Force 10 and Baldt's still holding.

Operators and contractors who have had to contend with Force 10 winds know that there are times when anything less than the best anchoring or mooring system is not good enough. And not good enough could be disastrous. They know they cannot afford to buy on price alone.

Recently, a major international oil company conducted its own survey of North Sea operators and contractors to determine which chain was performing best in that almost impossible environment. The response? Baldt.<sup>®</sup>

The only American manufacturer of large marine chain, Baldt has been the standard of the industry for 80 years. So much so, in fact, that other companies refer to some of their products as "Baldt" or "Baldt-type." No other company, however, can offer the total-systems engineering and premium-quality products that Baldt can.



As proof of our continuing leadership, we are currently introducing three new products — a high-impact polar (HIP) chain, a high-abrasion resistant or ARC chain, and a high-strength, light alloy chain we call ORQ<sub>2</sub>. We have also opened another manufacturing facility located in Corpus Christi, Texas. And we're developing the industry's most comprehensive catalog of anchoring and mooring systems and products for every aspect of the marine industry — from deck and dock hardware to pipelay mooring systems.

If you would like more information about our new catalog, about any of our new products, or about how we can engineer and manufacture a complete anchoring or mooring system for your specific marine application, please give us a call. You can contact your Baldt representative or one of our stocking distributors — Dreyfus Supply & Machinery, Washington Chain & Supply or Baldt (U.K.) Ltd.



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**Marine Coatings & Corrosion Control**

(continued from page 55)

**JOTUN MARINE**

The substantial attention given during recent years to the possibility of bunker savings by using more sophisticated bottom treat-

ment systems has, to a large extent, ended in a discussion of the efficiency of various antifouling types and especially selfpolishing and reactivatable antifoulings. According to Jotun Marine Coatings, which has marketed self-polishing antifouling types (Takata LLL) for many years, this type of modern antifouling is a part of the total answer.

Jotun feels it is necessary to

consider the total concept, which Jotun calls Underwater Hull Surface Management (UHSM). When studying the complex problem of friction between underwater hull and seawater, a number of factors should be considered. Roughness can be caused by a variety of problems including corrosion, flaking, blistering, faulty application, etc. Step one in UHSM is eliminating this roughness by

sandblasting back to bare steel (SA 2½).

A Jotun study, showing the relationship between bunker savings achieved and the payback period of the capital invested in the blast cleaning, reports that maximum payback period of the extra investment is 13 months. More likely, Jotun states, it would be closer to 4 months, and return of the extra capital invested as high as 75 to 250 percent. That study involved a 280,000-dwt ship, with an investment of \$545,000 in sandblasting and a more sophisticated primer system.

The self-polishing antifouling, such as Jotun's Takata LLL, does not leave a porous skeleton as the toxicant is chemically bound to the resin so the paint film slowly dissolves in the seawater. During drydocking, it is sufficient to clean the hull and apply new coats of antifouling directly over the old.

The reactivatable type of antifouling, such as Jotun's Seamasster, is based on different principle. This is built up the same way as the traditional longlife antifoulings. With this type, however, the skeleton can be removed periodically by a special underwater brushing machine. As a result, the service life of the antifouling film can be prolonged extensively—up to 4-5 years—between each drydocking depending on the original film thickness. By undertaking reactivation prior to drydocking, there will be no porous skeleton left on the surface when the ship is in dock. New antifouling can then be applied directly on top of the old the same as the selfpolishing antifoulings.

In both cases, either by using a selfpolishing antifouling or a reactivatable antifouling, it is possible to maintain the original smoothness of the underwater hull. Experience, Jotun reports, shows it has been possible to maintain smoothness on the underwater hull for as long as 11 years.

For further information and free literature on Jotun products, Write 29 on Reader Service Card

**KAISER CHEMICALS**

The Kaiser Chemicals Division of Kaiser Aluminum & Chemical Corporation manufactures and markets a line of magnesium and aluminum anodes used for cathodic protection in marine environments.

The Tulsa Metal Products facility has an aluminum anode capacity of 12,000,000 pounds, and produces a proprietary non-mercury aluminum alloy (KA90) as well as a mercury-type aluminum alloy anode (KA95). KA90 comes in configurations for use as flush

**COATINGS WITH VERSAMID 280-B-75 POLYAMIDE ADDUCT SHOW THEIR COLORS THROUGH 4000 HOURS OF SALT FOG TESTS.**



Henkel's exclusive Versamid 280-B-75 Polyamide Adduct, combined with our Genamid® 2000 Amidoamine Resin and an epoxy resin, are the basis for the tough coating systems defined in Navy specification MIL-P-24441. (SHIPS)

These marine and industrial coatings are inherently corrosion resistant. They outperform even traditional epoxy/polyamide systems formulated with costly rust inhibitive pigments. Even through 4000 hour salt-fog and two-year Florida tidewater testing.

The Versamid 280 System also is ideal in situations where you can't get the substrate as clean as you would like. That's because of its excellent substrate wetting and moisture displacement characteristics.

What's more, it is a low viscosity resin and provides the solvent savings of higher solids. And it offers improved cure at low temperatures.

Versamid 280's patented technology makes it the industry standard. Years of use on Navy ships prove it can handle the toughest marine and industrial applications.

So when you need to show your colors in long-lasting marine and industrial maintenance formulations, Henkel's Versamid 280 can help. For more information about this unusual resin system, write: Resins Division, Henkel Corporation, 4620 West 77th Street, Dept. MR-81, Minneapolis, MN 55435.

**Resins Division**

**Henkel**

mount hull anodes, ballast tank anodes, platform and multipurpose anodes.

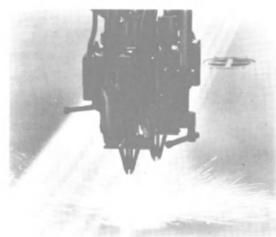
An ongoing quality control program and efficiency tests through electrochemical evaluation provide reliable seawater anodes for use on all types of offshore structures and vessels.

Magnesium ribbon anodes for ballast tank de-scaling are also available.

Technical services are available for evaluation of anodic requirements and performance. For a free copy of Kaiser's 20-page brochure "Aluminum Anodes for Cathodic Protection in Marine Environments,"

Write 30 on Reader Service Card

### METCO



Metco arc metallizing guns apply non-skid coating of aluminum to helicopter deck.

The U.S. Navy is testing a non-skid deck coating system based on arc-sprayed aluminum applied to helicopter deck areas. The system may last for years. It costs approximately \$3.00 per square foot, including material and application, and will postpone major maintenance for at least five years.

The coating system has already logged five years of sea duty on the USS Truett and is still in excellent condition. Now the Navy has expanded its test program to the USS Hewitt, making the Hewitt the first "air capable" ship to have a full flight deck covered with the new non-skid coating. Three additional Navy ships are scheduled to receive the coating system. It has civilian potential also, especially on metal walkways, which can become slippery when wet.

The non-skid system is applied by using off-the-shelf materials and equipment from Metco Inc. of Westbury, N.Y. As specified in the Navy's Technical Manual "Corrosion Control for Shipboard Launch and Recovery Systems," it consists of an arc-sprayed aluminum coating plus two seal coats of Metoseal SA sealer. The aluminum is supplied in wire form by Metco, and is applied with two Metco spray guns.

The goal is a non-skid coating that will last at least five years without major maintenance. This is more than double the service life of some coatings now in service.

The aluminum coating system

is easy to apply. A standardized procedure is followed. First step is to prepare the deck surface by sandblasting a five-foot-wide strip that is arc-sprayed the same day with a 6-mil cover coat of aluminum for corrosion protection. The arc-sprayed aluminum is applied immediately after the sandblasting so that moisture or other contaminants cannot form and

weaken the bond between the coating and deck. This 6-mil cover coat is then followed with a 20 to 25 mil "high profile" coat. The heavier coating is sprayed so as to produce a surface profile that is as rough as possible in order to accentuate the non-skid character of the coating. As the final step in the coating system, the sprayed aluminum is sealed for

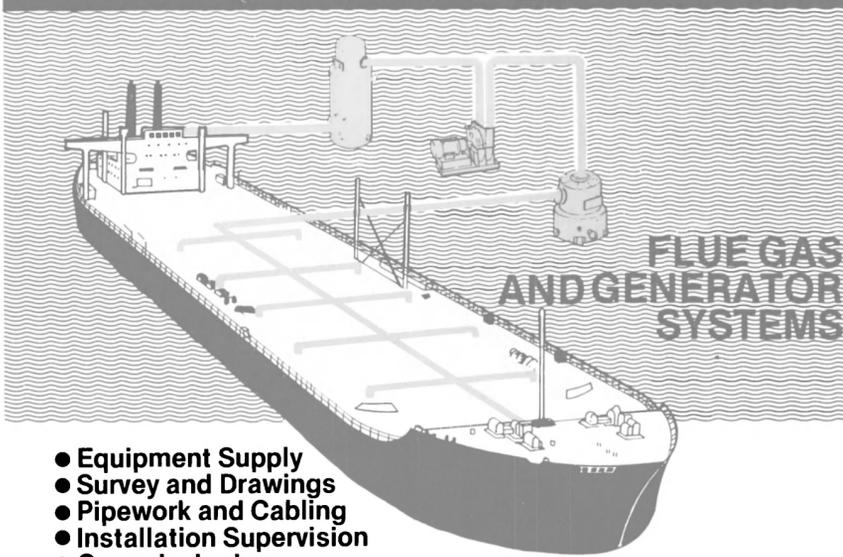
greater corrosion resistance with two coats of Metoseal SA silicon alkyd sealer. The Navy then applies a strontium chromate primer followed by an appearance of the traditional "battleship" grey.

For additional information on Metco products and services,

Write 31 on Reader Service Card

(continued on page 60)

# Inert Gas Systems



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**MARITIME  
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**Marine Coatings &  
Corrosion Control**

(continued from page 57)

**MOBIL  
CHEMICAL**

Mobil Chemical Company, maintenance and marine coatings department, supplies a complete line of high quality marine coatings for maximum protection and cor-

rosion resistance in all marine environments.

The company manufactures a unique single-package inorganic zinc rich coating called UNI-PAK. Mobil reports UNI-PAK provides all the advantages of a two package material but is supplied ready mixed in a single container. It contains 82.5% metallic zinc in the dry film and provides excellent early water resistance. It can be applied with either conventional or airless equipment. It provides a smooth cured film sur-

face which is uniform in color.

Literature is available for Mobil which contains performance statistics for UNI-PAK as well as complete details and information regarding Mobil's entire line of marine coatings.

**Write 36 on Reader Service Card**

**PALMER PRODUCTS**

Palmer Products, Inc. of Worcester, Pa. recently introduced a tough one-part, non-skid deck coating free of organic solvents.

Designated Durapox PM-1191, this coating meets OSHA requirements. PM-1191 consists of water base binder and abrasive particles. Soap and water can be used for the cleanup operation. No red label is required, and it is safe for use in confined areas.

PM-1191 is said to be economical to use, easy to apply by roller, and maintains excellent adhesion to most types of surfaces. It is resistant to water and chemicals whether the surface is dry, wet, or oily.

Another new product announced by Palmer is a marine hull-smoothing and repair compound named Redepox, which was developed specifically to meet the demanding needs of the marine industry. This fast-curing epoxy resin has excellent resistance to sea water and most chemicals.

Palmer Products provided the first approved paste repair resin to the U.S. Navy in 1956. Extensive use in marine and industrial applications over the past 25 years has provided the company with a proven background in epoxy resins development and use.

In filling pits and holes in ship hulls and rudders, Redepox trowels easily and feathers smoothly, thereby reducing machining time. It provides a smooth, spreadable consistency with non-sagging qualities; if required, it can be painted. A one-to-one hardener/resin ratio provides for simple on-site mixing and application.

For more information on Palmer's products,

**Write 32 on Reader Service Card**

**PRODUCTS  
RESEARCH**

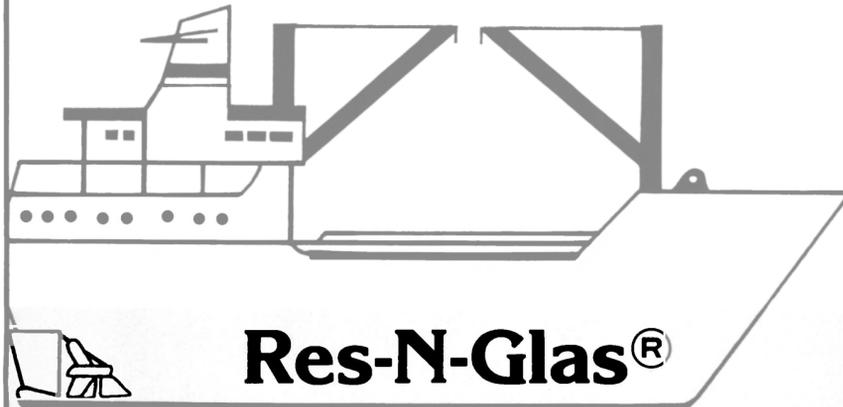
Products Research and Chemical Corporation, Glendale, Calif., has developed a series of polyurethane coatings specially designed to reduce maintenance and prevent corrosion. These coatings are based exclusively on the company's proprietary line of polyurethane polymers.

PRORECO® I, a seamless deck covering for interior spaces, consists of a corrosion-inhibitive primer, a flame-retardant polyurethane elastomer underlayment, colorful decorative chips, and a highly durable, non-yellowing polyurethane glaze. In service now for over 10 years by commercial and military marine users, PRORECO I has demonstrated significant weight and maintenance reduction advantages. Corrosion of metal decks caused by water seepage and infiltration is prevented. The manufacturer reports the inherent flexibility, resilience, and impact resistance of PRORECO I enable it to withstand severe ship movement and mechanical abuse without cracking, splitting, or loss of adhesion.

A companion system, PRORECO III, has been designed for exterior weather decks. This sys-

(continued on page 62)

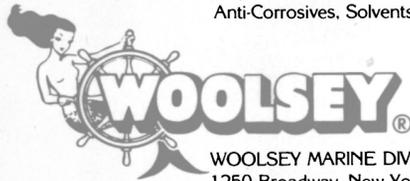
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name in marine paints.**



**Res-N-Glas®**

Woolsey Marine's Res-N-Glas® is a self-laminating Polyester-Flakeglass coating that protects ship bottoms against corrosion and abrasion. It is an industry standard — one of the many pioneer products produced by Woolsey for the marine industry since its founding in 1853.

Also available: Metal Primers and Anti-Corrosives, Anti-Fouling Bottom Paints, Alkyd and Vinyl Alkyd, Epoxy Polyamid, Chlorinated Rubber, Two-Component Primers and Anti-Corrosives, Solvents and Thinners, Boottop/Deck Coatings.



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ferryboat is being converted into a floating restaurant. The owners want the maximum protection against abrasion; the coating selected is Res-N-Glas.

Res-N-Glas is a polyester resin combined with three-micron-thick flakes of glass. One coat averages 120 layers of glass, depositing a 30-mil coating that is 98 percent by volume. These laminations not only provide a coating unusually resistant to erosion, abrasion, and electrolysis,

but also drastically reduce the rate at which water or corrosives pass through the film. It is also available with a wide range of catalysts, which enable it to adapt to most any temperature during application—another cost savings.

Woolsey also markets a full line of marine coatings for general use on hulls of steel, aluminum, and fiberglass.

For additional information on Woolsey products, Write 35 on Reader Service Card

### Houston Offshore Takes Delivery Of Two New Rigs, Orders Another

Houston Offshore International, Inc., Houston, Texas, has taken delivery on two Sabine-class rigs and has ordered the Sabine V, president Jerry E. Chiles announced recently.

The new rig will be built at Bethlehem Steel's Singapore shipyard and is scheduled for delivery

in September 1982. It is not under contract at this time.

The new rig is mat supported, cantilevered and capable of working in water depths up to 200 feet.

Houston Offshore has recently taken delivery on the Sabine III from Bethlehem's Sparrows Point, Md. shipyard. It is working on location in the Gulf of Mexico for Exxon. The Sabine IV was delivered from Bethlehem's Singapore Shipyard June 15 and currently is under tow to the Gulf of Mexico. It will arrive about September 1 and begin operations for CNG Producing Co. offshore Texas and Louisiana.

Houston Offshore also announced the renewal of contracts on three of its other rigs. The Sabine II's assignment for Shell Oil Co. has been extended for a year, carrying it through April 1982. The Nueces I contract with Shell has been extended through June 1982.

The Sabine I, formerly under contract to others, also has begun operations for Shell under a new, three-year contract, carrying it through June of 1984.

The Sabine-class rigs provide flexibility in operational water depths and weather conditions. They can operate in waters as shallow as 12 feet and can move on and off location safely in rough waters because of the mat.

The cantilevered drill floor permits exploratory or developmental drilling from 15 feet to 45 feet aft of the platform while cantilevered over existing wellhead structures. With hook plus setback loads of one million pounds and full size drilling equipment, the rig is ideally suited for drilling in the Gulf of Mexico and similar locations.

### Alan Green Jr. Becomes New FMC Chairman



Alan Green Jr.

Alan Green Jr. was sworn in recently as the new Chairman of the Federal Maritime Commission, replacing Dr. Leslie L. Kanuk, whose term expired June 30, 1981. The procedural ceremony was attended by the Commissioners and top staff members of the Commission.

Mr. Green, who is a businessman from Portland, Ore., has most recently served as president of the Port of Portland. He joined the Port Commission as a Commissioner in 1970, and was named its president in 1974 and again in 1981.

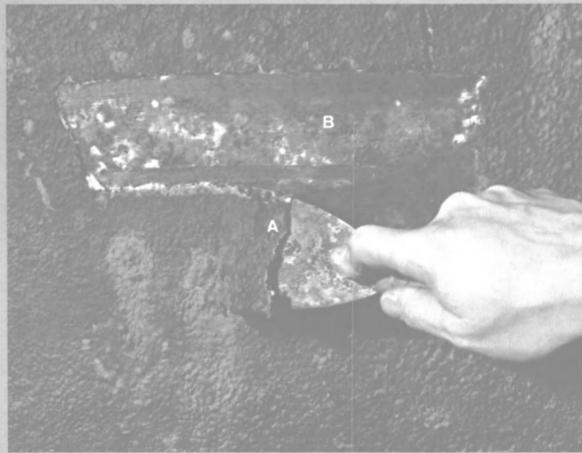


Photo from ABSTECH report shows no rust damage after 9 1/2 years. When Fluid Film (A) was scraped away from ballast tanks, no oxidation was found on base metal (B).

Fluid Film Gel B	Exotic Coatings
None to minimum surface preparation	Sandblasting required
Can be applied to damp surface	Dry surface required
Needs only one coat	Two to three coats required
No curing time needed.	48 hours curing time necessary
Over 400°F flash point during application	110°F flash point during application
Three-year no-rust guarantee.	No other guarantees known
Chart comparison based on in-service ballast tank applications.	

\*This guarantee does not cover applications where our specifications were not followed or to in-service vessels where Fluid Film may have been applied over loose, non-adhering rust/scale. It also does not cover any area where the material was removed.

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**Rust is the cancer. Fluid Film is the answer.**



EUREKA CHEMICAL COMPANY

**Sperry Awarded \$51-Million Contract By U.S. Navy For Spanish Combat Systems**

The Sperry Division of Sperry Corporation has received a \$51.1-million contract to implement the first phase of the combat system development and integration for three Spanish Navy guided-missile frigates and one aircraft carrier. The contract was awarded to

Sperry by the U.S. Naval Sea Systems Command, and is part of the Foreign Military Sales (FMS) program.

Under the terms of the contract, Sperry will design, construct and operate a Spanish Navy Test and Integration facility at its current plant site in Ronkonkoma, N.Y.; design the combat systems, integrate the equipment and test the systems for each of the three frigates and the carrier;

and provide training, as well as management and technical support.

The new Spanish Navy frigates are modified versions of the U.S. Navy's FFG-7 class guided-missile frigates. Sperry currently is the combat systems integrator for the U.S. Navy FFG-7 class ships. The Spanish frigates will continue to use the Sperry-developed MK 92 Mod 2 fire control system for weapons control.

The 14,300-ton Spanish aircraft carrier is being developed from a U.S. Navy carrier design designated the Sea Control Ship. The carrier will be equipped with a number of different aircraft, including the SH-3H helicopter, SH-60 LAMPS Mk III helicopter, and the AV-8 Harrier vertical take-off and landing (V/STOL) aircraft. The carrier design includes a "ski jump" launch deck.

The new ships will all have Naval Tactical Data System capabilities to allow fully integrated fleet defense operations with NATO nations.

The three frigates and the aircraft carrier will be built by Empresa Nacional Bazan de Construcciones Navales Militares S.A. in El Ferrol, Spain, located in the northwest section of the country.

The Spanish Navy Test and Integration facility in Ronkonkoma, N.Y., is already under construction. When completed, a detachment of about 15 Spanish Navy personnel will be assigned to the facility for training in computer program maintenance. Additional Spanish Navy and industrial personnel may be brought to the center for other training during the contract.

**General Morris Named President Of National Waterways Foundation**



Lt. Gen. John W. Morris

Lt. Gen. John W. Morris, USA (ret.), former Chief of Engineers, has been elected president of the National Waterways Foundation, a recently established research and education organization. The announcement was made by the Foundation's chairman, David A. Wright of St. Louis, president of National Marine Service, Inc.

"We are delighted to have a person of General Morris's professional background and international reputation to take a leading role in the National Waterways Foundation," Mr. Wright said. "His service will be invaluable in helping to guide the organization through its formative period, particularly in developing its program and in building its financial base."

Before his retirement last fall, General Morris headed the Army Corps of Engineers for more than four years, capping a distinguished 37-year career in this branch of the Army. His assignments included that of Tulsa District Engineer, Missouri River Division Engineer, and Director of Civil Works.

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**Peter R. Golia Joins  
Adams & Porter As VP**



Peter R. Golia

Adams & Porter Incorporated, the international insurance brokerage company with headquarters at 1 World Trade Center, New York City, announced that Peter R. Golia has joined the company as vice president in charge of its Average Adjusting and Claims Department.

Mr. Golia succeeds Harry R. Glaser, who retired July 1, 1981 after 32 years with Adams & Porter.

Mr. Golia received a B.S. degree from Manhattan College in 1949, and spent five years as a marine claims adjuster with underwriting companies before first joining Adams & Porter Incorporated in 1955. He left in 1970 to manage the Claims Department of Whitehall Brokerage, Inc.

**MarAd Issues Update Of  
World's Merchant Fleets**

The Maritime Administration has released an updated edition of its publication "A Statistical Analysis of the World's Merchant Fleets," with data as of December 31, 1979. The 158-page report includes summary statistics on age, size, speed and draft of vessels of major maritime fleets, and more detailed listings by ship type for countries having 100 or more merchant ships under their flags of registry.

Copies of the publication can be obtained through MarAd's Office of Public Affairs, Room 3895, Department of Commerce, Washington, D.C. 20230.

**Swiftships Completing  
20-Acre Repair Yard  
In Freeport, Texas**

Swiftships, Inc., one of the world's largest shipbuilders, announced plans to construct a 20-acre repair facility in Freeport, Texas.

When the facility begins initial operation on August 15, it will become the fourth shipyard owned and operated by the Morgan City, La.-based company.

The Central Texas Gulf Coast location was chosen, according to Swiftships president Jerry L. Hoffpauir, for two very specific reasons. "First, tug-supply and

large crewboat traffic off the Texas and Mexican coasts is increasing rapidly, and second, there is no other complete repair yard in the immediate area." Mr. Hoffpauir added, "We simply think its about time domestic vessels in the northwestern Gulf of Mexico had a complete repair facility nearby, and Swiftships is proud to provide one."

The shipyard will be located on the Intracoastal Waterway at its

junction with Union Bayou (or one mile from the mouth of the Brazos River—Freeport Ship Channel). On site will be an area for the construction of 250-foot and larger deck barges, plus a travel lift and two large drydocks.

The first drydock, scheduled for completion on September 15, will be 180 feet long, 62 feet wide (between wing walls) and will hold up to 2,500 tons. An additional drydock, to be completed Novem-

ber 1, will be 200 feet long, 82 feet wide, and will hold up to 3,500 tons.

The travel lift will have a capacity of 165 tons and the ability to haul a variety of large vessels—from 125-foot aluminum crewboats to 115-foot steel supply boats.

Managing the new repair facility for Swiftships will be Gulf Coast shipyard veteran Victor Pratkan.

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Pescador I by MARCO is powered by a Caterpillar D398TA diesel driving a Coolidge bronze propeller.

### First Of Five For Mexico From MARCO

Another step in the rapid growth of Mexico's commercial fisheries was achieved with MARCO Seattle's christening of the Pescador I. The 108-foot refrigerated sardine seiner is the first of five such vessels being built under contract with BANPESCA (Banco Nacional Pesquero y Portuario, S.A.), Mexico's government-sponsored bank dedicated to fisheries development.

Enhancement of Mexico's fisheries is part of President Jose Lopez Portillo's announced program to achieve self-sufficiency in foodstuffs for his nation.

A featured speaker for the

event was Alfonso Cebrenros, general director of BANPESCA, who expressed his confidence in the future of Mexico's fisheries with the help of modern vessels like the Pescador I. He was joined by his wife, Azalea Zurita de Cebrenros, who was the sponsor for the boat's christening.

The Pescador I is a refined version of a MARCO design proven in a variety of international fisheries. One of her improvements is a refrigerated seawater system designed by MARCO's Stewart Roach. The system chills six fish holds with a combined capacity of 8,500 cubic feet (240 cubic

meters). The new boat's high-capacity refrigeration feature is important because it greatly improves the quality of the fish delivered to the canneries.

The 108-foot (31.5-meter) Pescador I is 28 feet 2 inches (8.5 meters) wide at the beam and has a loaded draft of 14 feet 5 inches (4.4 meters). The steel vessel has crew accommodations for 14 and a cruising speed of approximately 11 knots.

Fishing deck machinery for the Pescador I is by MARCO. The selection includes MARCO's three-drum WS252 seine winch, 35E Puretic Power Block, U880 Capsulump, dewatering screen, purse blocks, and a variety of auxiliary winches. The hydraulic gear is powered through a MARCO DC26 Hydraulic Pump Drive (HPD) connected to the main engine with MARCO's recently introduced AirKlutch feature.

Power for the Pescador I comes from a turbocharged and after-cooled Caterpillar D398TA diesel rated at 750 bhp at 1,225 rpm. It drives a 76-inch-diameter Coolidge bronze propeller through a Caterpillar reduction/reversing gear. Auxiliary power is provided by Caterpillar and John Deere/Northern Lights diesel generator sets.

The new boat carries a variety of electronics and other navigational aids, including a Sperry autopilot and Furuno radar, sonar, depth sounder/recorders, and radiotelephones.

The following four vessels, to be named Pescador II through V, will be completed at intervals of approximately 30 days. The boats

are being built in MARCO's Ballard facility, with outfitting at the main shipyard.

### New York Harbor Carriers Association Issues Ten User Charge Guidelines

Ten guidelines for evaluating Federal waterway user charge proposals have been issued by the New York Towboat & Harbor Carriers Association. In announcing the guidelines, Daniel B. Curll, the Association's president, said: "Numerous proposals are surfacing in Washington to charge the maritime industry for use of Federal channels and the expenses of the Coast Guard. By developing a set of guidelines, we are providing criteria against which we can test each proposal that is made."

The guidelines are:

- Is the tax or charge simple to administer?
- Do all beneficiaries pay their share of the costs?
- Are those who do not benefit exempted?
- Is safety recognized as a benefit to the entire nation?
- Does each region pay only its own costs?
- Do Federal user charges and subsidies treat all transportation modes equitably?
- Has the legislative branch retained oversight on the activities of agencies like the Coast Guard and Corps of Engineers?
- Is the productivity of Federal agencies that charge for services equal to that of the private sector?
- Do those who pay have a voice in how the funds are spent?
- Will projects progress from conception to completion faster than at present?

Historically, navigation and channel maintenance costs have been funded out of general revenues. According to Mr. Curll, the Association, which represents the tugboat and barge operators in the New York and New Jersey port area, supports the objectives of the Reagan Administration, but it is concerned about some of the user charge implementation mechanisms that the Administration and others have suggested.

Anthony J. McAllister Jr., the newly elected chairman of the Association, stated: "Governments have had a major role in transportation since ancient times. An efficient transportation system is a public good that benefits all citizens. Many transportation facilities are used by such diverse interests that governments are the logical central point for planning, funding, and operation. In this country, the Federal Government has had a major role in Western rail expansion, the Interstate Highway System, aviation flight control, and waterway

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navigation aids and channel maintenance.

"The President has made a forceful argument," said Mr. McAllister, "that better economic decisions will be made if waterway costs are paid for directly by those using the facilities rather than subsidized from general taxes paid by users and everyone else. This Association does not object to our shallow-draft portion of the marine industry paying for the specific costs incurred for its benefit. But we would object, and the Reagan goal would not be achieved, if we paid for services we did not want or need."

By issuing guidelines, the Association is showing a good faith interest in discussing the user charge concept. Most members are convinced, however, that user charges will be found inappropriate for financing certain government services such as those related to safety. Other costs may be recoverable through user charges if equity among modes, ports, and users is assured.

#### Massport's Martin Pilsch Elected To Board Of Directors Of IAPH

Massport port director Martin C. Pilsch Jr. has been elected a director of the International Association of Ports and Harbors (IAPH). At a recent meeting of the IAPH held in Nagoya, Japan, Mr. Pilsch was elected to the board of directors for a three-year term. He was also elected to represent the American Region on the IAPH Executive Committee, which supervises the organization's activities.

The IAPH is a 25-year-old organization based in Japan. It is dedicated to promoting worldwide water commerce, exchanging information about maritime administration and development, and encouraging standardization of international trading procedures. The organization has 394 members representing 73 countries.

#### NKK Develops New Method For Stress-Testing Offshore Structures

NKK (Nippon Kokan) researchers working on a Kumamoto University research team have discovered a new method for estimating stress factors and durability of offshore structures.

Shin-ichi Hirayama, president of NKK America, Inc., said one result of these studies is AWS's design standards (X curve) which estimates the fatigue strength from strain amplitude of stress concentration at the joints.

As this method does not clearly distinguish fatigue failure and crack initiation, the team devised the following procedures:

- (1) From the size and shape of

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welded joints, the fatigue notch factor,  $K_f$ , which describes the condition of the welded toe notch, is calculated.

- (2) Assuming that the relationship between the local plastic stress of the notch which results in fatigue failure and the nominal strain can be described by Neuber's calculation, replace the  $K_t$  (elastic stress concentration factor) by the  $K_f$  in the formula.

- (3) After obtaining an S-N di-

agram (maximum stress versus the number of stress cycles applied on a sample material) from fatigue tests on steel materials and deposit metal, a cyclic stress-strain curve is figured from the diagram.

- (4) From the above two steps, the local plastic stress and strain of the notch is determined and the fatigue life until crack initiation is calculated.

When advance information is

available regarding the size and shape of the welded joints and the fatigue properties and nominal strain material and deposit metal, the fatigue life until crack initiation can be calculated precisely without making troublesome fatigue tests using models. This new method has been verified through a variety of tests.

For further information from NKK,

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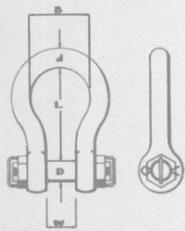
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"HIGH LOAD" SHACKLES										
Safe Working Load U.S. tons	Body Dia. d	Pin Dia. D	Inside Length L (Min.)	Inside Width at Pin W	Inside Width at Eye B	Outside Eye Dia. (Max.)	Approx. Wt. per 100 in lbs.	Catalog Code	Code	Generation
1/4	3/8	1/2	1 1/4	1 1/8	1 1/8	1 1/2	5	UBG 1 1/4		
1/2	3/4	1	1 3/4	1 3/8	1 3/8	1 3/4	12	UBG 2		
3/4	7/8	1 1/4	2 1/4	1 7/8	1 7/8	2 1/4	18	UBG 2 3/4		
1	1 1/8	1 3/4	2 3/4	2 1/8	2 1/8	2 3/4	30	UBG 3		
1 1/2	1 3/8	2	3 1/4	2 3/8	2 3/8	3 1/4	49	UBG 3 3/4		
2	1 7/8	2 1/4	4 1/4	3 1/8	3 1/8	4 1/4	78	UBG 4		
3 1/4	2 1/8	3	5 1/4	4 1/8	4 1/8	5 1/4	149	UBG 5		
4 1/2	2 3/8	3 1/4	6 1/4	5 1/8	5 1/8	6 1/4	222	UBG 6		
6 1/2	3 1/8	4 1/4	7 1/4	6 1/8	6 1/8	7 1/4	343	UBG 7		
8 1/2	3 3/8	5	8 1/4	7 1/8	7 1/8	8 1/4	534	UBG 8		
9 1/2	3 7/8	5 1/4	9 1/4	8 1/8	8 1/8	9 1/4	746	UBG 9		
12	4 1/4	6 1/4	10 1/4	9 1/8	9 1/8	10 1/4	968	UBG 10		
13 1/2	4 3/4	7	11 1/4	10 1/8	10 1/8	11 1/4	1,287	UBG 11		
17	5 1/2	8 1/4	13 1/4	12 1/8	12 1/8	13 1/4	1,749	UBG 12		
25	6 3/4	10 1/4	16 1/4	15 1/8	15 1/8	16 1/4	2,802	UBG 14		
35	8 1/4	13 1/4	20 1/4	19 1/8	19 1/8	20 1/4	4,154	UBG 16		
45	9 3/4	15 1/4	23 1/4	22 1/8	22 1/8	23 1/4	5,940	UBG 18		
55	10 3/4	17 1/4	26 1/4	25 1/8	25 1/8	26 1/4	8,412	UBG 20		
70	12 1/4	20 1/4	30 1/4	29 1/8	29 1/8	30 1/4	10,850	UBG 22		
85	13 3/4	23 1/4	34 1/4	33 1/8	33 1/8	34 1/4	11,948	UBG 24		
120	17 1/4	30 1/4	42 1/4	41 1/8	41 1/8	42 1/4	21,000	UBG 28		
DIMENSIONS SHOWN ARE NOMINAL										
<p><b>SCREW PIN ANCHOR</b></p>										
<p><b>SCREW PIN CHAIN</b></p>										
<p><b>SAFETY ANCHOR</b></p>										
<p><b>SAFETY CHAIN</b></p>										

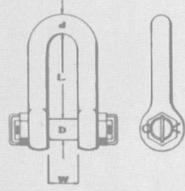


# L SHACKLES

"HIGH CAPACITY" SHACKLES							
DIMENSIONS IN MM (AND INCHES)							
Safe Working Load U.S. tons	Body Dia. #	Pin Dia. (D)	Inside Length (L) (mm.)	Inside Width at Pin (W)	Eye Dia. (mm.)	Ordering Code	Approx. Weight Each (Kgs./lbs.)
50	50 (2)	55 (2 1/4)	250 (9 7/8)	85 (3 3/8)	180 (7 1/8)	HCA 50	22 (48)
80	85 (2 3/8)	70 (2 7/8)	320 (12 5/8)	110 (4 3/8)	200 (7 7/8)	HCA 85	43 (95)
120	100 (3)	82 5/16 (3 1/8)	390 (15 3/8)	130 (5 1/8)	250 (9 7/8)	HCA 100	73 (160)
150	120 (3 3/8)	95 (3 7/8)	425 (16 7/8)	150 (5 7/8)	280 (11 1/8)	HCA 120	115 (250)
175	135 (4)	110 (4 3/8)	480 (18 7/8)	185 (7 3/8)	300 (11 7/8)	HCA135	175 (385)
200	140 (4 1/4)	120 (4 7/8)	520 (20 5/8)	175 (6 7/8)	330 (13 1/8)	HCA140	210 (460)
250	160 (4 3/8)	130 (5 1/8)	575 (22 5/8)	200 (7 7/8)	380 (14 7/8)	HCA160	290 (640)
300	180 (5 1/8)	145 (5 3/4)	650 (25 5/8)	210 (8 3/8)	400 (15 7/8)	HCA180	370 (810)
400	210 (6 3/8)	170 (6 5/8)	710 (27 7/8)	225 (8 7/8)	450 (17 3/8)	HCA210	520 (1140)
500	240 (6 3/4)	190 (7 5/8)	775 (30 5/8)	250 (9 7/8)	500 (19 3/8)	HCA240	830 (1830)
750	280 (7 7/8)	215 (8 3/8)	830 (32 3/4)	240 (9 3/8)	585 (23)	HCA280	1400 (3070)
1000	320 (9 1/8)	255 (10 1/8)	900 (35 3/8)	295 (11 5/8)	740 (29 1/8)	HCA320	2350 (5150)
DIMENSIONS SHOWN ARE NOMINAL							
DIMENSIONS IN MM (AND INCHES)							
Safe Working Load U.S. tons	Body Dia. #	Pin Dia. (D)	Inside Length (L) (mm.)	Inside Width at Pin (W)	Eye Dia. (mm.)	Ordering Code	Approx. Weight Each (Kgs./lbs.)
50	50 (2)	55 (2 1/4)	200 (8)	85 (3 3/8)	HCC 50	20 (44)	
80	85 (2 3/8)	70 (2 7/8)	250 (10)	110 (4 3/8)	HCC 85	40 (90)	
120	120 (3 3/8)	82 5/16 (3 1/8)	300 (11 3/8)	130 (5 1/8)	HCC 120	70 (155)	
150	150 (4 1/4)	95 (3 7/8)	350 (13 3/8)	150 (5 7/8)	HCC 150	115 (255)	
175	175 (4 3/4)	110 (4 3/8)	400 (15 3/8)	165 (6 3/8)	HCC175	170 (370)	
200	200 (5 1/4)	120 (4 7/8)	450 (17 3/8)	175 (6 7/8)	HCC200	200 (445)	
250	250 (6 3/4)	130 (5 1/8)	500 (19 3/8)	200 (7 7/8)	HCC250	280 (620)	
300	300 (7 1/4)	145 (5 3/4)	550 (21 3/8)	210 (8 3/8)	HCC300	350 (770)	
400	400 (9 1/4)	170 (6 5/8)	600 (23 3/8)	225 (8 7/8)	HCC400	500 (1100)	
500	500 (11 1/4)	190 (7 5/8)	640 (25 1/8)	250 (9 7/8)	HCC500	600 (1330)	
750	750 (16 3/4)	215 (8 3/8)	700 (27 3/8)	340 (13 3/8)	HCC750	1350 (2970)	
1000	1000 (22 3/4)	255 (10 1/8)	850 (33 3/8)	395 (15 5/8)	HCC1000	2260 (4970)	
DIMENSIONS SHOWN ARE NOMINAL							



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### Design Contract Let For New Container Terminal In Port Of Los Angeles

Steps toward a new 100-acre container terminal at Berths 121-126 in the Port of Los Angeles were taken recently as the Board of Harbor Commissioners approved a final Environmental Impact Report (EIR) and agree-

ments with consultants to design the facility. Previously, the board had entered into an agreement (Permit No. 441) with American President Lines, Ltd. (APL) to develop the new container facility.

The board awarded the design contract for the project to the combined team of Daniel, Mann, Johnson and Mendenhall (DMJM) as prime consultants, with Jordan / Casper / Woodman / Dobson

(JCWD) and Williams Engineering as principal subconsultants. This combination will best utilize the knowledge and experience of each firm.

The combined fee for the design of the wharf, backlands and buildings has been established at \$1.4 million with an additional fee of not more than \$100,000 if detailed design for a container crane transfer mechanism is also

required. In addition, DMJM, as prime consultant, will receive a construction administration services fee of \$389,600.

As proposed, the new terminal will be used exclusively by American President Lines, an existing tenant. The project will include modification of 600 lineal feet of existing wharf at Berth 126 plus construction of 1,360 lineal feet of new reinforced concrete wharf using the standard currently under development for the container terminal planned at the port's Berths 216-218. Completion of the entire terminal complex is expected in the summer of 1983.

### St. Louis Ship To Build 10 Jumbo Hopper Barges Costing \$3.1 Million

Leviathon Barge Partners-I, Ltd., P.O. Box 22030, Cleveland, Ohio, has applied for a Title XI guarantee to aid in financing the construction of 10 jumbo hopper semi-integrated river barges. The barges will be 195 feet by 35 feet by 12 feet.

St. Louis Ship, division of Pott Industries, Inc., St. Louis, Mo., is the proposed builder of the barges, which are to be used in the inland waters of the United States.

If approved, the Title XI guarantee would cover \$2,351,340 or 75 percent of the estimated actual price of \$3,135,120.

Delivery is scheduled for October 1981.

### Goldston Shipbuilding To Build Supply Vessel For Jackson Marine

Goldston Shipbuilding Corporation of Corpus Christi, Texas, announced it has signed a contract with Jackson Marine Corporation of Aransas Pass, Texas, for the construction of a supply vessel. This contract represents Goldston's entry into the supply boat market.

The vessel will be a 160-foot by 38-foot by 14-foot offshore supply boat powered by Caterpillar 3512 main engines.

William Goldston, president of Goldston Shipbuilding Corporation, has also announced that it is completing its expansion program to enable the shipyard to construct up to 200-foot vessels.

Nearing completion at the Ingleside facility is a 75-foot offshore tug and several 120-foot deck barges.

Goldston Shipbuilding Corporation is a wholly owned subsidiary of the Goldston Corporation of Corpus Christi. The 30-year-old multipurpose engineering-construction firm is engaged in a wide variety of engineering and construction activities, including docks, marine terminals, plant maintenance and general contracting.

An increasing number of ships use a gyro compass as their prime heading reference. Robertson's steering systems incorporate the unique electronic SKR80 gyro compass which is based on the proven state-of-the-art Singer Kearfott MAREX gyro. Reliability and quality are a matter of course, being a result of the Robertson steering knowledge accrued from 30,000 onboard installations over the year.



#### Electronic gyro compass

The unique electronic design of the Robertson SKR-80 gyro compass provides short alignment time, while also minimizing errors under dynamic conditions:

- simple operation
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- unique accuracy and stabilization
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#### Autopilot

The Robertson AP8 autopilot may be programmed upon installation to suit any ship. It is designed for accurate course selection and course maintenance with a built-in offcourse alarm. Rudder feedback, voltage levels, gyro compass input, steered course, are all continuously monitored, any malfunction being indicated both visually and acoustically.



#### Steering column

The SS-3 steering column contains all the necessary controls and instruments for steering ships of all sizes. The modular construction contains:

- steering unit with 2 independent electrical systems
- autopilot
- control unit for Robertson electronic gyro compass
- rudder command and course indicator.



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### Bird-Johnson's 100th Controllable Pitch Propeller For U.S. Navy

The 100th, 40,000-hp controllable pitch propeller manufactured by Bird-Johnson Company for the U.S. Navy will power the 31st Spruance Class destroyer, The Hayler (DD-997), currently under construction at Ingalls Shipbuilding, Pascagoula, Miss. Delivery of this propeller, which brings the total to 4,000,000 hp produced for four U.S. Naval Programs, was recognized in a recent ceremony at Bird-Johnson's headquarters in Walpole, Mass. Rear Adm. John D. Beecher, USN; Archibald J. Dunn, Ingalls Shipbuilding; U.S. Congressman John Joseph Moakley; and George S. Kariotis, Massachusetts Secretary of Economic Affairs, joined the company's executive officers and employees to commemorate the event.

Assembled in the exact configuration in which it will be installed onboard ship, the bronze,

five-bladed propeller, measuring 17 feet in diameter and weighing over 52,000 pounds, completed its final operational checkout at Bird-Johnson's testing facilities. Suspended over a test pit 10 feet wide by 40 feet long, the propeller underwent an eight-hour dynamic spin test in air to verify proper mechanical performance and system reliability. It was tested at 110 percent of design speed — 183 rpm.

This is the 71st propeller delivered to Ingalls under a Navy contract; the remainder were supplied to Bath Iron Works, Maine, and Todd Shipyards, California. In recognition of Bird-Johnson Company's long-term, successful involvement with Ingalls Shipbuilding and the U.S. Navy, company officers Charles A. Orem, Howard H. Scott, and Donald E. Ridley presented plaques commemorating the 100th propeller delivery to Archibald Dunn, vice



Speakers and guests at Bird-Johnson Company's ceremony commemorating the 100th, 40,000-hp CP propeller delivery to the U.S. Navy are, from left to right: Rear Adm. John D. Beecher, USN; Charles A. Orem, president, Bird-Johnson Co.; Representative Francis H. Woodward, Walpole, Mass.; Congressman John Joseph Moakley; Howard H. Scott, chairman of the board, Bird-Johnson Co.; Archibald J. Dunn, Ingalls Shipbuilding; and George S. Kariotis, Massachusetts Secretary of Economic Affairs.

president, Programs Management at Ingalls, and Admiral Beecher, Deputy Commander for Surface Combatant Ships, Naval Sea Systems Command. Admiral Beecher

noted in his remarks to the crowd, "By the end of this decade, about half of the surface combatant ships in the U.S. Navy will mount Bird-Johnson propellers."

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# Practical Compliance With Latest USCG and IMCO REGULATIONS



Alfred D. Isaacson and John Kron Jr. \*

The introduction of IMCO regulations, last amended in 1978, and the publication of USCG regulations, September 1979, require that all ships calling on U.S. and IMCO nations' ports will be required to comply with these regulations by the specified dates. In the U.S. this date is June 1, 1981. IMCO will be implemented two years after ratification, however, several member nations have already required implementation.

For new ship construction, the regulations are specific and compliance offers no particular problem since initial ship designs will integrate the required changes. However, for existing ships, compliance requires complex modifications. The regulations allow several options for compliance, which gives the operator some leeway.

For example, for tankers over 70,000 dwt, the owner has the option of converting the ship to a

segregated or clean ballast tanker or installing a crude oil washing system in the cargo tanks. Obviously, economics will direct the approach. The most difficult portion of this will be to predict accurately the future utilization of the ship, i.e.: trade routes, charters, guaranteed pumping rates, fuel costs and fuel availability.

However, in order for timely compliance with regulations decisions must be made based upon best estimates. This paper outlines some of the methods which can be utilized, which factors are important and how to best comply with the regulations.

The regulations apply to all ships in the applicable tonnage categories. However, ships other than tankers can usually comply with minor additions of equipment and modifications.

The Intergovernmental Maritime Consultative Organization (IMCO) has published standards and regulations which form the basis of the U.S. as well as each member nation's regulatory policy. The U.S. regulations are nearly identical to those of IMCO and are published in the Code of Federal Regulations and are administered by the U.S. Coast Guard.

## Alternatives

Existing tankers over 40,000 dwt must have either Crude Oil Washing (COW) or Segregated Ballast Tanks (SBT). Clean Ballast Tanker (CBT) is allowed until June 1, 1985 for 40,000 to 70,000 dwt crude carriers or until June 1, 1983 for 70,000-dwt crude carriers. This allows an operator to plan future modifications for the newer ships or a planned phase-out of older ships.

For existing VLCCs or ULCCs, there usually is an obvious choice of only COW. Most of the more modern ships already have a COW system installed even though it probably does not meet IMCO or USCG requirements. To upgrade an existing COW system is usually the best alternative.

Those ships with no COW system are more difficult to convert to COW, especially tankers with deepwell pumping systems. Additionally, ships with COW systems must have an Inert Gas System (IGS). Should an existing ship not have IGS, the additional cost of an IGS installation may direct a different approach.

It is imperative that before a decision is made for each vessel, a complete economic analysis be performed which includes the trade routes, cargo revenue and

operating costs as well as conversion options. In each case, the life expectancy of the ship and the guaranteed pumping rate of the charter are additional factors to consider.

## System Selection

Owners of vessels in the charter business (and fleet operators) are interested in modifications which will not affect the charter rate of the vessel and which will allow the vessel to operate in a variety of trade routes and have the capability to carry different types of cargo on different voyages.

The time frame in which these modifications can be carried out is also very important. The USCG date may affect the vessel's operation in an existing charter. The law allows no provisions for granting extensions to these dates for compliance with the regulations.

Recent amendments to the regulations, from the November 1980 IMCO meeting, allow owners to switch the trade of the vessel, i.e., from a product carrier to a crude carrier, without recertification. This allows an owner to operate a vessel in the crude trade on one voyage and in the product trade on the return leg of the

\*Mr. Isaacson and Mr. Kron, M. Rosenblatt & Son, Inc., presented the paper condensed here before the recent symposium on marine auxiliary systems, sponsored by the United States Merchant Marine Academy, Department of Engineering, and the Eastern U.S.A. Branch, Institute of Marine Engineers.

voyage without recertification. Under these conditions, a ship must comply with the ballast system regulations for each trade.

#### Ballast Systems

A permanent ballast system is an alternative to meet the regulations. The ballast system consists of designated tanks and associated piping systems to carry ballast only, and all other remaining tanks are used for cargo.

The selection and arrangement of tanks for ballast use is primarily based on the amount of ballast needed to meet the draft and trim requirements of the regulations and the size and the number of tanks on the vessel. These requirements, along with the vessel's bending and shear limitations, determine the possible ballast tank arrangement. It is apparent that a vessel with a large number of tank divisions will have more possible tank arrangements available.

The final arrangement of tanks can be based upon the alternatives of pumping and piping arrangements and the trade in which the vessel will operate in the future. This arrangement must be submitted to regulatory bodies for approval.

There are basically two types of ballast systems, clean ballast tanker and segregated ballast tanker. It should be noted, however, that a CBT system is a means of compliance for a temporary period of time.

In a clean ballast system, it is possible to isolate one of the existing cargo-oil pumps and suction lines such that it may be used for ballast. This may require small piping modifications both in the cargo tanks and in the pump room. The modifications will consist of connecting and breaking pipe connections and installing valves for the double valve isolation. The disadvantage of this system is that the cargo pumping capacity will be reduced with one pump used for ballast. This arrangement will, however, accommodate cargo pumping and ballasting operations simultaneously.

A segregated ballast system will require the installation of an additional pump specifically designated for ballast service. Placement of the new pump is dependent on available space in the pump room and/or machinery space. With a pump located in the pump room and its driver in the machinery space, a new ballast main is installed through the cargo tanks. This new ballast main services the designated ballast tanks. Any existing cargo lines servicing the designated ballast tanks will be removed or blanked.

The owner also has the option of installing a pump and driver in the machinery space. With the pump in this location, a main line can be run to the upper deck servicing the ballast tanks.

It should be noted that the use of line blinds for segregation of ballast from oil is not acceptable.

A positive break in the system is required with stored spool pieces which would be used for specific emergencies.

#### Crude-Oil Washing

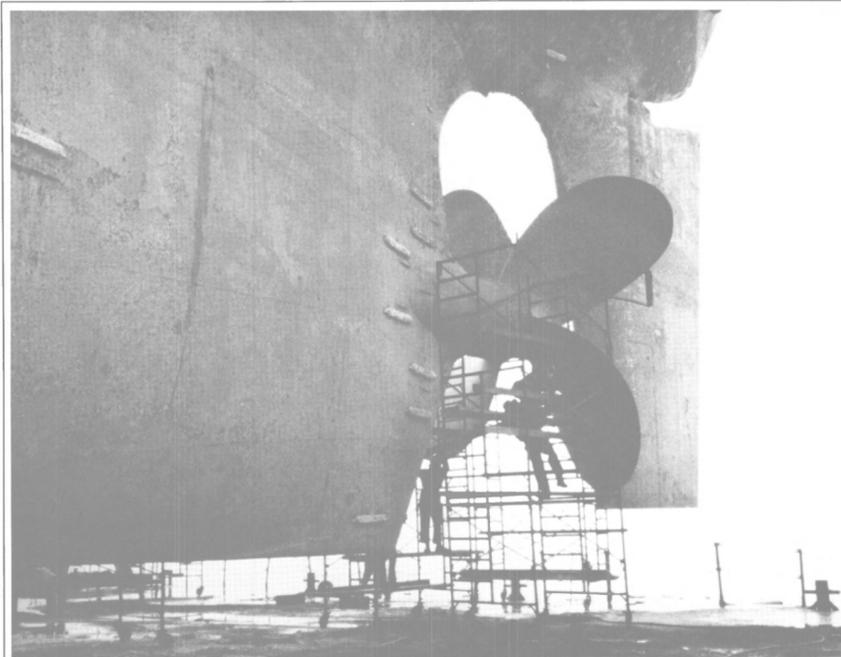
Crude-oil washing is another alternative for compliance with the regulations.

A COW system basically consists of a number of fixed tank-cleaning machines in which crude oil is directed at a high pressure and velocity at the sides and

structure of the cargo tanks to remove the waxy asphaltic deposits that build up from the voyage. The tank-cleaning machines used in these operations either have a programmed pattern or have a selective program option to the pattern. The tank-cleaning machines are supplied by a main line that is connected to the discharge side of the cargo pumps, either in the pump room or on the upper deck (sometimes supplied from the cargo manifolds).

The number and placement of the COW tank-cleaning machines is determined by the computation of shadowed areas in the tanks. Shadows are those which do not receive a direct impingement from the tank-cleaning machines. The amount of shadowed areas allowed, as stated in the Regulations, is 10 percent for horizontal surfaces and 15 percent for vertical surfaces.

As essential to the satisfactory (continued on page 74)



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**Regulations**

(continued from page 73)

placement of COW tank-cleaning machines is the design and installation of a tank stripping system which is capable of maintaining the tank bottom free of standing oil during the tank cleaning operation. It has been the practice of many owners to increase the tank stripping capability of

the vessel. An increased capability in the tank stripping system will allow for the simultaneous operation of a greater number of tank-cleaning machines, thereby reducing total tank cleaning cleaning and terminal time.

One application utilizes a constant-pressure regulating valve to reduce any pressure surges that may be caused by stopping the tank-cleaning machines. Also, the use of this valve may decrease the terminal time of the vessel

due to additional shore discharge of cargo which is not needed for COW operations.

On the ballast leg of the voyage, the clean-ballast-designated tanks are crude washed and water rinsed prior to receiving clean ballast. Dirty ballast (departure and/or emergency) is discharged in accordance with the regulations without regard to tank washings.

**Inert Gas Systems**  
The Inert Gas System require-

ments of the regulations requires modifications to the system.

An inert gas system directs flue gas from existing boilers (or from an inert gas generator) through a scrubber unit, blower, and pressure regulating valve to suitable distribution piping located on the upper deck. A deck water seal is also included in the system. The IGS system must maintain an oxygen content of less than 5 percent in gas.

One major area of importance in the design of the system is the consideration of what type of materials should be used for the components in the system. This is due to the corrosive nature of the gas. Some owners have opted to use reinforced thermosetting resin type piping in the distribution system. It should be noted that the use of this piping has not yet been approved by all regulatory bodies.

Another major concern is that the system is designed to maintain a positive pressure in the cargo tanks, especially during cargo pumping and COW operations. The venting arrangement is extremely important.

**Costs and Conclusions**

The following costs for modifications of existing ships can be used as a guide in estimating future modifications. Each ship will be different due to its particular configuration.

Inert gas installations, for existing tankers, are in the vicinity of \$1,000,000 per ship for a 100,000-dwt crude carrier.

Crude oil wash system installation for a 280,000-dwt crude carrier should cost \$600,000 to \$1,000,000. However, most recently constructed VLCC and ULCC vessels have an existing COW system which probably does not meet regulatory body requirements. A typical modification requiring additional fixed deck machines, some submerged machines, new piping and a modified stripping system would cost \$300,000 to \$400,000.

For a deepwell-pump-type tanker, the cost will increase due to the necessity of providing improved stripping capability.

For existing tankers, 150,000-dwt, installation of a segregated ballast tank system with new piping, a new pump and electrical modifications might cost \$500,000 to \$600,000. For an 80,000-dwt tanker, the modification of an existing system to a dedicated clean ballast tank system, including isolation of one of the existing cargo pumping systems for use in the CBT, will cost approximately \$150,000.

It is then obvious that the costs are considerable and are an important factor in the decision of which approach to take. However, it is imperative to evaluate the entire regulatory requirement and operational profile as well as the expected life and utilization of each ship before undertaking the modernization of the ship.

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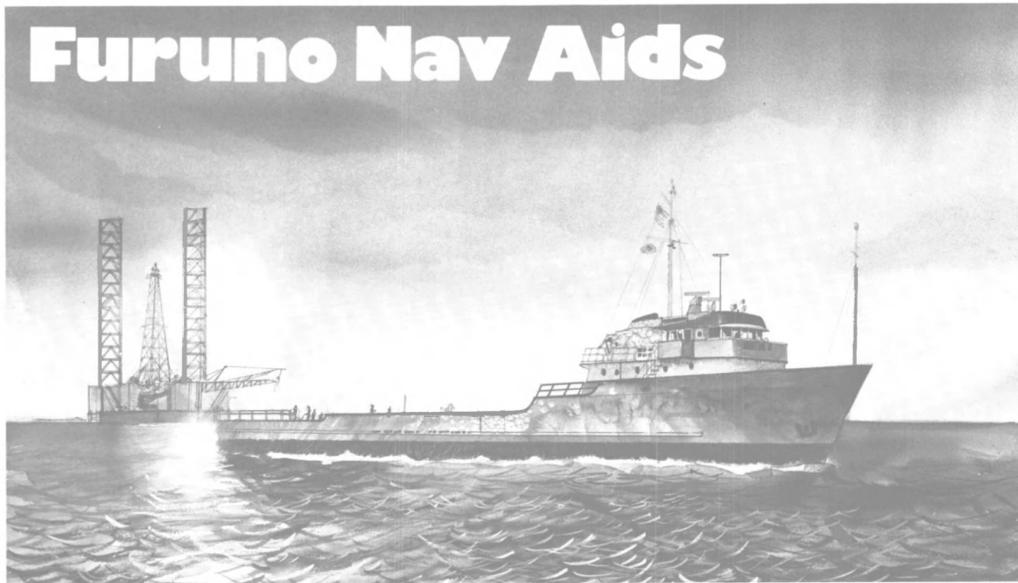
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### Bay Shipbuilding Delivers M/V Columbia Star To Oglebay Norton Company

Oglebay Norton Company has taken delivery of its first 1,000-foot self-unloading vessel.

The new supercarrier was constructed by the Bay Shipbuilding Corp., subsidiary of The Manitowoc Company, Inc., at Sturgeon Bay, Wis. Construction began in the autumn of 1979 and the keel was laid on March 3, 1980. The hull was floated out of the construction dock on November 8, 1980.

Ceremonies conducted recently officially named the Great Lakes ore carrier to honor the company's Columbia Transportation Division and the brig Columbia that carried the first cargo of iron ore through the Soo Canal in 1855. The vessels of the Columbia fleet, one of the largest on the Lakes, bear a bright red star on their stack.

After departing the shipyard, the vessel proceeded to Silver Bay, Minn., to load her first cargo, 49,244 gross tons of iron ore pellets. The Columbia Star will make Toledo, Ohio, its primary lower Lakes port.

The new Columbia Star carries

61,000 tons of cargo at maximum draft. Longer than three football fields and 105 feet wide, the vessel maneuvers with the assistance of bow and stern thrusters utilizing stainless-steel controllable-pitch propellers driven by 1,500 horsepower electric motors.

Four diesel engines developing 14,000 total horsepower move the vessel at a service speed of 15 miles per hour. A self-unloading vessel, the Columbia Star is equipped with a 265-foot conveyor boom which swings over the vessel's side to discharge up to 10,000 tons of bulk cargo per hour.

The main propulsion unit was supplied by the Electro-Motive Division of the General Motors Corporation. The KaMeWa controllable-pitch propellers were produced by Bird-Johnson Company. The ship's service power is generated by Caterpillar diesel engines.

Master of the M/V Columbia Star is Capt. Joseph J. Toreki of Perry, Ohio, who has sailed with the Columbia fleet since 1948. Chief engineer is Norman E. Jen-



EMD-powered M/V Columbia Star is Oglebay Norton's first 1,000-ft. self-unloader.

sen of Clearwater, Fla. Chief Jensen joined the company in 1954.

#### Tampa Barge Offers Successful Bid For T/S Bay State

The Maritime Administration has announced that the Tampa (Fla.) Barge Services, Inc., with an offer of \$275,000, was the successful bidder for the 465-foot

former training ship T/S Bay State, which was offered for sale to U.S. citizens for nontransportation use or scrapping May 19.

This vessel should not be confused with the present training vessel of the Massachusetts Maritime Academy which carries the same name.



MTU-powered M/V C/Wanderer, a new crew/supply vessel designed and built by Swiftships, Inc. of Morgan City, La.

### Swiftships Delivers M/V C/Wanderer To Co-Mar Offshore Corporation

The M/V C/Wanderer is a new crew/supply vessel designed and built by Swiftships, Inc. of Morgan City, La. The all-aluminum craft is operated by Co-Mar Offshore Corporation of Morgan City, and is the 29th vessel Co-

Mar or affiliated companies have taken delivery from Swiftships, Inc. Co-Mar also has 11 vessels under construction at this time. The two MTU 12V331TC71 main engines coupled with a 2.5:1 ZF BW 455 reduction gear provided

the C/Wanderer with a sea trial speed of 23 knots. Auxiliary engines consist of two 3-71 Detroit Diesels which drive 30-kw generators.

Swiftships' project engineer Calvin LeLeux said of the USCG-approved craft: "Anyone in need of a tough, all-purpose boat should really consider this type. We designed it for versatile use, maximum maneuverability and solid speed."

The 65-foot by 18-foot cargo deck is approved for a 90-long-ton cargo capacity. Carrying 4,550 gallons of fuel, C/Wanderer also holds 3,500 gallons of transferable potable water, 1,000 gallons of ships potable water, and 14,620 gallons of drill water. It has quarters to house a five-man crew in addition to being able to transport 47 passengers. Year-round comfort is maintained by air-conditioning and heating throughout.

Electronics, supplied and installed by Bibbins & Rice, include a Furuno FR-711 radar; a TI-9900 Ioran by Texas Instruments;

two radiotelephones, a TRM SSB and an MRT-55 VHF, both by Drake, and a Danforth 654C compass.

The propellers, supplied by Columbian, are 42-foot by 38-foot four-blade, bronze. The C/Wanderer has a beam of 25 feet and draws 5.5 feet fully loaded. The craft comes fully equipped with firefighting capabilities and life-saving gear.

Co-Mar Offshore Corporation has placed the C/Wanderer into the drilling operations along the Gulf of Mexico.

### Vice Adm. Williams Named Chief Of Naval Material

Vice Adm. John G. Williams Jr., USN, Deputy Chief of Naval Operations (Submarine Warfare), has been named Chief of Naval Material, succeeding Adm. Alfred J. Whittle Jr., USN, who has retired. Recently, he was a member of the Navy Secretary's Special Committee to review the Trident submarine program.

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The vessel is propelled by a single propeller, driven by a three cylinder, triple expansion, steam reciprocating engine. Boilers are oil burning, scotch type. A bow thruster unit is fitted forward.

For a detailed description of the S.S. Maxine, or to obtain bidding instructions, terms and conditions for submitting bids, and bid form WSW-2, please contact either of the following:

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**John K. Stuart Named  
Fleet Engineer At  
Oglebay Norton Company**

John K. Stuart has been appointed fleet engineer at Oglebay Norton Company. He succeeds Sidney L. Spinner who has retired.

Mr. Stuart joined the compa-

ny's Columbia Transportation Division in 1980 as assistant fleet engineer. Prior to that, he was vice president-engineering at the Great Lakes Towing Company. He had been associated with that company since 1955. He holds a Bachelor of Science degree from the U.S. Merchant Marine Academy at Kings Point, N.Y., and in

1954 earned a Bachelor of Science degree in naval architecture and marine engineering from the University of Michigan. In three years service with the United States Navy he rose to the rank of lieutenant as gunnery officer aboard a destroyer. He is a member of The Society of Naval Architects and Marine Engineers, The Propeller Club, the Society of



John K. Stuart

Naval Engineers, and the Cleveland Yachting Club.

Oglebay Norton operates 17 vessels on the Great Lakes, including a new 1,000-foot self-unloading vessel, Columbia Star, which entered service in June of this year.

**Bailey In New Orleans  
Building Stores Boxes  
For Five Avondale Tankers**

1981 is shaping up to be a very busy year at Bailey Corporation. The New Orleans firm is presently building ship's stores boxes for five tankers under construction at nearby Avondale Shipyards.

"We're probably the only Gulf Coast company that could tackle a job of that size and still serve our normal trade with no sacrifice in quality or speed," says Bailey vice president Hank Fray. The trade to which he refers is a thriving 33-year-old business in marine refrigeration and air-conditioning, carpentry, joinery, and insulation.

Bailey operates out of a 22,000-square-foot shop and warehouse complex on Alver Street in New Orleans's port district. According to general manager Alfred (Mickey) Johnson, that warehouse is one key to Bailey's success. "We keep it practically *overstocked* with spare parts, equipment and supplies," he explained. "That means we'll handle retrofits, repairs, and service on any vessel in the Gulf—workboat to tanker, all major brands of equipment. And we'll do it fast."

Counting on that kind of service are such fleet customers as Lykes Bros., Delta Line, and Waterman Steamship Company, and manufacturers like Carrier and York who have named Bailey their authorized Gulf Coast service representative.

Messrs. Fray and Johnson, who head all operations of Bailey's New Orleans shop, come to the task well prepared. Both are expert in the field of centrifugal compressors, each with over 30 years of relevant experience. Mr. Johnson got his with Carrier's factory service team before coming to Bailey in 1948, and Mr. Fray served as a ship's engineer for various steamship companies, last serving as licensed first engineer.

For further information on the services and capabilities of Bailey in New Orleans,

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**Bill Tate Appointed  
President At Tate Temco**



Bill Tate

Bill Tate was recently appointed president of Tate Temco, Inc. following the retirement of **Duncan Black**. Mr. Tate had held the position of vice president of sales and operating manager. He received his M.B.A. degree from the University of Virginia, and served a tour of duty as supply officer aboard destroyers. Mr. Black will continue as a member of the Tate Industries executive board.

Tate Temco, Inc. is a manufacturer of pipe line strainers, specialty valves, and air driers serving industry throughout the U.S. and abroad.

**Marinette Marine Awarded  
Contract For 14 Workboats**

Marinette Marine Corporation, Marinette, Wis., has been awarded a contract by the U.S. Naval Sea Systems Command for the construction of 14 fifty-foot workboats. The vessels are steel hull construction with an overall length of 50 feet, a beam of 14 feet 4 inches, and a full-load draft of 4 feet 6 inches. Delivery of the vessels will be two per month, starting in early 1982, with seven delivered to the East Coast and seven delivered to the West Coast.

The award of this contract to Marinette Marine Corporation marks another program for the U.S. Navy being built by Marinette, and continues a 25-year tradition of building defense-related equipment.

**Tracor Marine Awarded  
\$1.7-Million Contract For  
R/V Conrad Overhaul**

William C. Moyer, Ph.D., Group vice president of Tracor, Inc., Austin, Texas, recently announced the company's subsidiary, Tracor Marine of Fort Lauderdale, Fla., has been awarded a \$1.7-million contract for overhaul and modernization of the Research Vessel Robert G. Conrad. The R/V Conrad, a 209-foot-long, 13,370-ton AGOR-class vessel, is owned by the U.S. Navy and is assigned to and operated by Lamont-Doherty Geological Observatory of Columbia University. During her 19 years of operation, the

R/V Conrad has been among the most productive research vessels in the world, with an average of about 300 days per year actively engaged in research cruises.

In addition to regular hull and mechanical Classification Society survey and repair work, the overhaul will extend the operating life of the Conrad 10 to 15 years by enabling the installation and operation of the most advanced oceanographic research equipment and greatly improving her

safety, habitability, and reliability. Improvements include: additional laboratory space, a marine sanitation system, new ship service generators and power distribution system, more powerful seismic survey equipment, improved deck handling systems, and more habitable berthing and messing facilities.

The R/V Conrad overhaul and modernization is being funded by the Navy, Lamont-Doherty, and the National Science Foundation,

and is under the direction of Dr. Mark Langseth of Lamont-Doherty, who is supported by Robert G. Gerard, Lamont's marine superintendent, and James P. Ollander, the Conrad's captain and on-site representative. The detailed design package was developed by Rudolph Matzer and Associates, naval architects of Jacksonville, Fla. Completion of the work at Tracor Marine's Port Everglades shipyard is expected by November.



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later reference when cruising or fishing in the same area. The Lat Long grid can be automatically drawn in the North-up or West-up format. The adjustable grid scale lets you cover a vast area. A visual alarm lets you know if there have been changes or errors in input data.

For further information and free literature on the TP-4553, Write 60 on Reader Service Card

**Armco Offers Bulletin  
On High Strength, Low  
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Those concerned with steels for offshore platforms and drilling barges, ship hulls, pressure vessels, construction equipment, or line pipe valves and fittings, will want to add this new product data bulletin. It contains full data on Armco CT Steels, a family of high strength, low alloy, fine-grained carbon-manganese-columbium grades. All these steels are available in plates. One version (Armco CT-N) can be desulfurized to maximum sulfur levels as low as 0.006 percent, and is also available for some wide-flange applications.

In eight pages this Armco CT Steels bulletin covers specifications, applications, availability, dimensions, chemical composition, mechanical properties, fabrication, and lists sales offices. For a free copy, Write 61 on Reader Service Card

**Triple 'A' South Awarded  
\$6.3-Million Contract  
For Landing Ship Work**

Triple "A" South, San Diego, Calif., is being awarded a \$6,399,980 firm fixed price contract for the regularly scheduled overhaul of the tank landing ship USS Barbour County (LST-1195). The Supervisor of Shipbuilding, Conversion and Repair, USN, San Diego, is the contracting activity. (N62791-74-C-0030)

**Joseph Coco Appointed  
Controller Of Consolidated  
Inland Marine**



Joseph S. Coco

Joseph S. Coco has been named controller of Consolidated Inland Marine, Inc., Beaumont, Texas, a wholly owned subsidiary of Consolidated Petroleum Industries, Inc. Mr. Coco most recently was on the staff of Exxon Company U.S.A.'s Treasury Department. Prior to that he held various supervisory positions in financial and credit areas during his 13-year tenure with Exxon.

He will be based in Beaumont and, in addition to heading the firm's financial activities, will assist Phillip Stringer, president of Consolidated Inland Marine, in various business endeavors. Consolidated Inland is a petroleum barge company operating on the Intracoastal Canal and inland river systems of Texas, Louisiana, Mississippi, Alabama, and Oklahoma.

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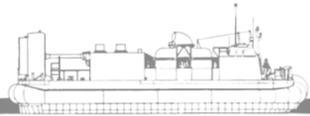
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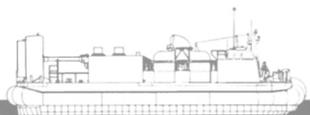
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## INVITATION FOR BIDS

The WOODS HOLE, MARTHA'S VINEYARD & NANTUCKET STEAMSHIP AUTHORITY invites sealed bids for CONTRACT #17-81 as follows:

Provide all labor, equipment, materials, supervision and do all incidental work necessary to perform structural modifications and re-engine the Authority's Vessel S/S NAUSHON, including delivery, in strict accordance with plans and specifications provided by the Authority.

Proposals must be made on the Form of Proposal provided by the Authority and must be enclosed in a sealed bid return envelope provided by the Authority for that purpose.

Plans, specifications and necessary bidding documents may be obtained from Contracts Office, Steamship Authority, P. O. Box 284, Woods Hole, MA 02543 after Monday, 6 July 1981. (617) 548-5011 Ext. 217.

A deposit of \$500.00 (refundable) is required for a complete set of contract plans, specifications and bidding documents.

Sealed Bids will be received by the Authority (only) at its General Offices, Woods Hole, MA 02543 until 1:00 P.M. Eastern Daylight Savings Time on Monday, 17 August 1981, at which time they will be publicly opened and read aloud.

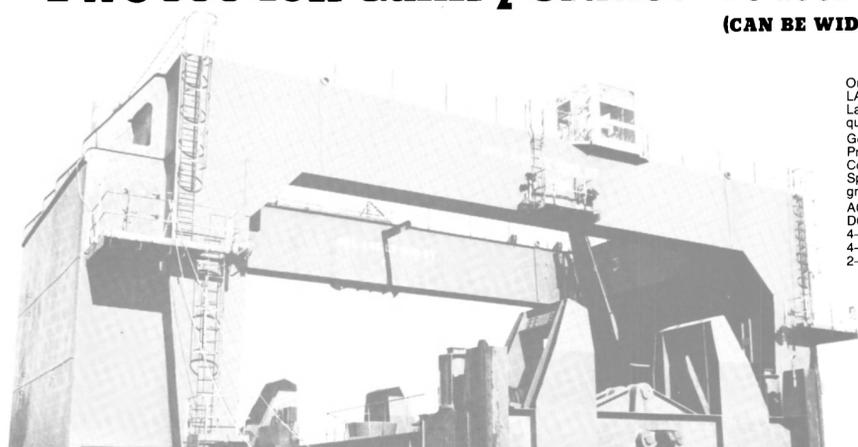
The Authority specifically reserves the right to reject any or all bids and to waive any informalities in accordance therewith.

WOODS HOLE, MARTHA'S VINEYARD & NANTUCKET STEAMSHIP AUTHORITY  
 P. O. Box 284  
 Woods Hole, MA 02543

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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  
DC Hoist & Gantry Motors & Controls  
4-150 HP-240 Volt DC Hoist Motors  
4-150 HP-240 Volt DC Gantry Motors  
2-265 KW-500 Volt DC M-G Sets  
Units Can Be Modified  
Possible other uses:  
1) Moving heavy equipment  
2) Dam Sites  
3) Concrete Prefab plants  
4) Railroad yards  
5) Steel plants  
Geared Track is also available at extra cost

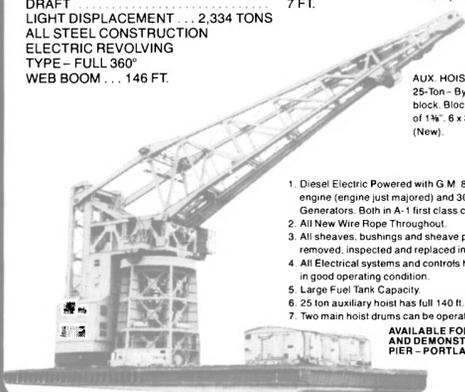
## 200 TON/DIESEL ELECTRIC Floating Crane

FOR SALE - RENT - CHARTER

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

MAIN HOIST  
200-Ton - By 2 only, 8 part blocks. Each block carries 2,050 lb. of 1 1/2" 6 x 37 1/2 P.S. wire rope (New).

AUX. HOIST  
25-Ton - By 1 only 4 part block. Block carries 1,110 lb. of 1 1/4" 6 x 37 1/2 P.S. wire rope (New).



1. Diesel Electric Powered with G.M. 8-278A diesel engine (engine just majored) and 300 KW, 230 volt Generators. Both in A-1 first class condition.
2. All New Wire Rope Throughout.
3. All sheaves, bushings and sheave pins have been removed, inspected and replaced in Good Condition.
4. All Electrical systems and controls have been placed in good operating condition.
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6. 25 ton auxiliary hoist has full 140 ft. of boom travel.
7. Two main hoist drums can be operated independently.

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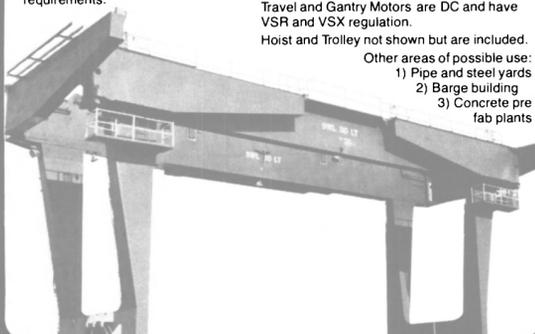
## FOUR 30-TON Container Cranes 70-foot Track Span

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.

AC Power Input with Cable Reel and 350 feet of 500 MCM Cable.  
MG set: 250 HP-AC-170 KW 230 DC.  
• 200 HP DC Hoist Motor • 100 HP DC Trolley Motor • 2-40 HP DC Gantry Travel Motors • Trolley Travel 275 F.P.M. • Gantry Travel 100 F.P.M. • Hoist Speed: 30 LT @ 85 F.P.M.; 20 LT @ 100 F.P.M.; 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.  
Other areas of possible use:  
1) Pipe and steel yards  
2) Barge building  
3) Concrete pre fab plants



For additional information, brochures or inspection, contact: Hugh Sturdivant, Sales Manager, or A.D. Canulette, Jr.



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 P. O. BOX 26208    P. O. BOX 233    P. O. BOX 825  
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**INVITATION FOR BIDS**

The WOODS HOLE, MARTHA'S VINEYARD & NANTUCKET STEAMSHIP AUTHORITY invites sealed bids for CONTRACT #18-81 to furnish Auxiliary Diesel Engines for the Authority's vessel S/S NAUSHON as follows:

Two (2) GM 12V71 Diesel Generator Sets;  
 One (1) GM 12V71 Bow Thruster Engine;  
 and One (1) GM 4-71 Ballast Pump Drive Engine.

Proposals must be made on the Form of Proposal provided by the Authority and must be enclosed in a sealed bid return envelope provided by the Authority for that purpose.

Necessary bidding documents may be obtained from Contracts Office, Steamship Authority, P. O. Box 284, Woods Hole, MA 02543. (617) 548-5011 Ext. 217.

Sealed Proposals will be received by the Authority (only) at its General Offices, Woods Hole, MA 02543 until 1:00 P.M. Eastern Daylight Savings Time on Monday, 3 August 1981, at which time they will be publicly opened and read aloud.

The Authority specifically reserves the right to reject any or all bids and to waive any informalities in accordance therewith.

WOODS HOLE, MARTHA'S VINEYARD & NANTUCKET STEAMSHIP AUTHORITY  
 P. O. Box 284  
 Woods Hole, MA 02543

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Push Boat, 52' Twin Screw Diesel 104 Gross Ton — all steel. 2-Tier Pilot House. Kingston, New York.

Call 1-914-331-3312

**Exceptional Buys, Tow Motor, Diesel Forklifts, Pneum Tires**

1. 20,000 lb. #8-20, 158" lift, 96" forks at \$22,500.
2. 30,000 lb. #AM-30 168" lift, 72" forks at \$38,000.
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1981 — MARINE SURVEY PRACTICE COMPENDIUM — By R.A. Cody — \$54. pp  
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**NEW WATERTIGHT DOORS**

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

**SIZE**  
 26"x48"    26"x66"  
 26"x60"    30"x60"

EACH DOOR  
**IMMEDIATE DELIVERY**

**QUICK-ACTING LEVER OPERATED WATERTITE DOORS**

**26" X 66"**  
**8-DOG**  
**Rights & Lefts**

**EXTRA LARGE PANAMA CHOCKS**



Clear opening 16" X 20" — 10" Radius. 3 1/2" High — 40 1/2" long.

**NEW 7" RADIUS PANAMA CHOCKS**  
 (MEET PANAMA REGULATIONS)  
 14" X 10" CLEAR OPENING

With extended legs for welding to deck. 14" Wide on base — length 28" — height 27 1/4". IMMEDIATE DELIVERY FROM STOCK.

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Closed chocks — 12" X 6 1/2" inside opening — 23" overall outside — 8" high — 15" high — 7" radius — weight 110 lbs. IN STOCK.

**GOOD - USED DOUBLE STEEL BOLLARDS**  
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DIESEL POWERED  
LIFEBOATS



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

With air-cooled Deutz diesel engine, gear box and propeller. Has fuel oil and water tanks, provision storage. Mfg. by FR Fassmer & Co., Germany. Built to German Lloyd's requirements. #6706 built 1977; #6859 built 1977.

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### Gotaverken Arendal Delivers Jackup Rig To Mexican Owner



The jackup drilling rig Totonaca (shown above) was delivered recently to Perforaciones Maritimas Protexa S.A. of Mexico by Gotaverken's Arendal Shipyard in Sweden. Following delivery, the rig began the trip to the Gulf of Mexico, where Protexa will operate it for Mobil.

This is the fourth jackup of Friede and

Goldman L-780 design completed by the Arendal yard. Two units were built for Salen Energy of Sweden — Salenergy V and Salenergy VI — and two for Protexa, the other one named the Zapoteca. All four rigs will operate in the Gulf of Mexico or off the coast of Brazil.

### ASNE/SNAME Joint Meeting Hears Report On Clearing Of Suez Canal

A recent joint meeting of the Pacific Northwest Sections of the American Society of Naval Engineers and The Society of Naval Architects and Marine Engineers saw a movie on salvage, and heard Capt. J. Huntly Boyd of the Puget Sound Navy Shipyard discuss the problems of clearing the Suez Canal in 1974. After a truce had been declared, the U.S. Navy was asked to clear the Canal of 10 wrecks, one of which was to be salvaged.

The Canal was first swept for mines, unexploded bombs, and ammunition. The size, location, and condition of the wrecks were outlined. Each one presented a different problem of removal. For removing the wrecks, two 500-ton lift cranes and a 2,400-ton lift craft were used.

The wrecks that were too large to handle in a single lift were cut into pieces. Divers would score the vessel with an oxy torch and then attach explosives. To reduce diving time, many of the lifts were done with two cranes/lift craft working together.

Where the current presented a problem, cofferdams were constructed. The cofferdams



Principals at Pacific Northwest ASNE/SNAME joint meeting included (L to R): Section chairman for ASNE Carson Wheeler of PACCAR; speaker Capt. J. Huntly Boyd, Commander of Puget Sound Naval Shipyard; and Section chairman for SNAME Les Coward of CCS Marine Associates, Ltd.

allowed divers to work in the vessel without swimming through an unpredictable current. The wrecks had built up a fair amount of silt that had to be removed.

At the meeting, SNAME announced the election results of next year's officers: Section chairman is Tom Dyer of Foss Launch & Tug Co., and secretary-treasurer is William Dahlbeck of Goston Associates. Area vice chairmen are: Puget Sound Area, Bruce Ade of University of Washington; Columbia River Area, Jim Grider of Northwest Marine Iron Works; and B.C. Area, Victor Gadsby of Vancouver Shipyards. Area secretary-treasurers are: Don Merrit of Dillingham Ship Repair for Columbia River, and Chalmers Morris of Vancouver Shipyards for the B.C. Area. John T. Mitchell of Northwest Marine Iron Works was elected to the Executive Board.

# BUYERS DIRECTORY

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York Division (Borg-Warner Corp.), P.O. Box 1592, York, PA 17405

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Kaiser Aluminum & Chemical Corp., 300 Lakeside Dr., (Rm 2039KB), Oakland, CA 94643  
Wilson-Walton International Inc., 66 Hudson Street, Hoboken, NJ 07030

## BEARINGS—Rubber, Metallic, Non-Metallic

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Lucien Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309  
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186

## BLASTING—Cleaning—Equipment

Aurand, 1270 Ellis Street, Cincinnati, OH 45223  
Butterworth Systems Inc., 224 Park Ave., Flaham Park, NJ 07932  
Goff Corporation, One Pleasant Grove Rd., Seminole, OK 74868

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B.R.I. Coverage Corporation, 156 Williams Street, New York, NY 10038  
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Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y. 10006

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## CONTAINERS—Cargo Container Handling

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Arnesen Marine Systems, Inc., One Battery Plaza, New York, N.Y. 10004  
Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913  
Megsystems, Inc., 1075 N.W. 58th Street, Boca Raton, FL 33431  
National Marine Service, Inc., 1750 Brentwood Blvd., St. Louis, MO 63144  
Pan American Systems Corporation, P.O. Drawer 400, Belle Chasse, LA 70337  
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.  
Transmetra Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062

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General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, Massachusetts 02260  
Golten Marine Company, Inc., 162 Van Brunt Street, Brooklyn, NY 11231  
Twin Disc, Inc., Racine, Wis. 53403

## ELECTRICAL EQUIPMENT

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Marine Safe Electronics of Canada Ltd., 101 Jardin Dr., Suite 24, Concord, Ontario, Canada L4K 1B6  
Oceanic Electrical Mfg. Co., Inc., 159 Perry Street, N.Y. 10014  
Port Electric Supply, 157 Perry Street, N.Y., N.Y. 10014  
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

## EMULSIFICATION SYSTEMS

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

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Argo Marine, Div. of Argo Intl., 140 Franklin St., New York, N.Y. 10013  
Comet Marine Supply Corp., 157 Perry St., New York, N.Y. 10014  
Conhagen/USMP Company, Inc., 4475 South Clinton Ave., South Plainfield, NJ 07080  
Consope Inc., P.O. Box 40339, Houston, TX 77040  
Keppell Marine Products, 550 South Fulton Ave., Mount Vernon, N.Y. 10550  
J. H. Menge & Company, Inc., P. O. Box 23602, New Orleans, La. John P. Nissen, Jr. Company, Glenside, PA 19038  
Rockwell International, Power Tool Division, 400 N. Lexington Ave., Pittsburgh, PA 15208  
Schnitzer-Levin Marine Co., 445 Littlefield Ave., So. San Francisco CA 94080  
Schwepper Beschlag GmbH, Postfach 101110, 5620 Velbert 1, West Germany  
Stal Laval Inc., 525 Executive Blvd., Elmsford, NY 10523  
Sudimport, 5 Kolyevskaya, Moscow K-6, USSR  
Unitor Shios Service A/S, Mastemy, 1410 Kolbotn, Norway  
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186  
Xarbox, Division of Greene & Kellogg, Inc., 290 Creekside Dr., Tonawanda, NY 14150

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Lukens Steel Company, Coatesville, PA 19320  
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Hartzell Propeller Fan Company, 901 S. Downing Street, Piqua, OH 45356  
Joy Manufacturing Co., 338 So. Broadway, New Philadelphia, Ohio 44663  
Zidell Explorations, 3121 S.W. Moody St., Portland, Ore. 97201  
FENDERING SYSTEMS—Dock & Vessel  
Hughes Bros., Inc., 17 Battery Place, New York, N.Y. 10004  
Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062  
Seaward International, Inc., 6269 Leesburg Ave., Falls Church, Va. 22044

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

## FUEL OIL ADDITIVES—Analysis & Combustion Testing

Rofite Products Inc., 300 Broad Street, Stamford, CT 06901

## FURNITURE

Bailey Joiner Co., Inc., 74 Sullivan Street, Brooklyn, N.Y. 11231  
Comfort-Mate, Inc., 7988 NW 5th Street, Miami, FL 33166

## GALLEY EQUIPMENT

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

## GANGWAYS

Butterworth Systems Inc., 224 Park Ave., Fort Lauderdale, Fla. 33311  
Ramomaster Inc., 1226 N.W. 23rd Ave., Fort Lauderdale, Fla. 33311

## HATCH & DECK COVERS—Chain Pipe

Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07207  
Lackland Company, Inc., R D 2 Burnett Road, Mendham, NJ 07945  
MacGregor-Comarain, Inc., 135 Dermody St., Cranford, N.J. 07016  
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11690  
Julius Mack & Sons, Inc., 20 Vesey St., New York, NY 10017

## HULL CLEANING

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

## HYDRAULICS

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

## INERT GAS—Generators—Systems

ATCO Marine Corporation, 603 Dean St., Brooklyn, NY 11238  
Comar Corporation, P.O. Box 460, Worcester, MA 01613  
Foster Wheeler Boiler Corp., 110 So. Orange Ave., Livingston, N.J. 07039  
Fredrikstad mek. Verksted, N. American Agents, American United Marine Corp., 375 Madison Ave., New York, N.Y. 10022  
Peabody Holmes Ltd., 17-27 Garratt Lane, London SW 18 4BY

## INSULATION—Cloth, Fiberglass

Bailey Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231

## INSURANCE

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

## JOINER—Waterlight Doors—Paneling

Masonite Commercial Division, Dover, OH 44622  
Walt & Kretzer, Inc., 400 Trabold Road, Rochester, NY 14624

## KEEL COOLERS

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

## LIFEOATS & DAUGHTS

Peabody Holmes Ltd., 17-27 Garratt Lane, London SW 18 4BY  
Schof Davit Corporation, 226 West Park Place, Newark, DE 19711

## LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights

Browning Marine, Inc. (Aqua Signal), P.O. Box 8060, St. Charles, IL 60174  
The Guest Corporation, 17 Culbro Drive, West Hartford, CT 06110  
Oceanic Electrical Mfg. Co., 157 Perry Street, New York, N.Y. 10014  
Oreck Corp., 100 Plantation Rd., New Orleans, LA 70123  
Perko Inc., P.O. Box 64000, Miami, Florida 33164  
Port Electric Supply Corp., 157 Perry Street, New York, N.Y. 10014

## MACHINE TOOLS

Republic-Lagan Machine Tool Co., 1000 E. Carson St., Carson, CA 90749

## MACHINERY MAINTENANCE, REPAIR, OVERHAUL AND TESTING

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

## MOORING SYSTEMS

Sanson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110

## NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS

Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Highway (Suite 1300), Arlington, VA 22202  
Apermar, Ave. 17 No. 108-129, P.O. Box 1465, Maracaibo, Venezuela  
All Points Associates, Inc., RD #1, Box 3309, Monroeville, OH 44847  
American Standards Testing Bureau, Inc., 40 Water Street, New York, N.Y. 10004  
Amikson Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, Md. 20015  
J.L. Bludworth, P.O. Box 2441, Corpus Christi, TX 78403  
Jacksonville, Florida 32211  
Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130  
C.D.I. Marine Co., Regency East, Suite 222, 9951 Atlantic Blvd., CTS & Associates, 11320 S.W. 108 Court, Miami, Fla. 33176  
CADCOM, 107 Ridgely Ave., Annapolis, MD 21401  
Childs Engineering Corp., Box 233, Medfield, Mass. 02052  
John P. Colletti & Associates, P.O. Box 13378, Pittsburgh, PA 15243  
Columbia-Seminal Engineers Western, Inc., P.O. Box 21542, Seattle, WA 98111

Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, Mass. 02027

Crane Consultants Inc., 15301 1st Ave., So. Seattle, Washington 98148  
C.R. Cushing & Co., Inc., One World Trade Center, New York, N.Y. 10048

Norman N. DeJong & Associates, Inc., 1734 Emerson St., Jacksonville, Fla. 32207

Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129

Designers & Planners, Inc., 2341 Jefferson Davis Hwy., Suite 1100, Century Bldg., Arlington, VA 22202

Dunhauser Marine, Inc., 11511 Katy Freeway, Houston, TX 77079

Francis C. Duote, P.E., P.O. Box 644, Kenner, LA 70063

Parker C. Emerson & Associates, 17935 Cardinal Drive, Lake Oswego, Oregon 97034

Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, N.Y. 11050

Friede and Goldman, Ltd., 225 Baronne St., New Orleans, La. 70112

Gianmatti & Associates, Inc., 703 Giddings Ave., Suite U-3, Annapolis, MD 21401

Gibbs & Cox, Inc., 40 Rector Street, New York, N.Y. 10006

John W. Gilbert Associates, Inc., 38 Commercial Wharf, Boston, Mass. 02110

The Glisten Associates, Inc., 610 Colman Bldg., 111 First Ave., Seattle, WA 98104

Phillip Gresser Associates, Ltd., 3250 South Ocean Blvd., Palm Beach, FL 33480

Maris 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

Hofmeyer Maritime Consultants Inc., 9 Glen Head Road, Glen Head, NY 11545

Hydraulics, Incorporated, 7210 Pindell School Road, Howard County, Laurel, Maryland 20810

Janzen Engineering Co., 6655-H Amberton Drive, Baltimore, Md. 21227

James S. Kroger & Co., Inc., 3333 Rice St., Miami, Fla. 33133

Littleton Research and Engrg. Corp., 95 Russell St., Littleton, Mass. 01460

Luander Designs, P.O. Box 711, San Perito, TX 78590

Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063

John J. McMullen Associates, Inc., 1 World Trade Center, New York, N.Y. 10048

MacLear & Harris, Inc., 28 West 44 Street, New York, N.Y. 10036

Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 9th St. & Rockwell Ave., Cleveland, Ohio 44114

Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, N.Y. 11746

Marine Technical Associates, Inc., 195 Paterson Avenue, Little Falls, NJ 07424

Maritime Service Company, 1357 Rosecrans St., Suite B, San Diego, CA 92106

Rudolph F. Matzer & Associates, Inc., 13891 Atlantic Blvd., Jacksonville, Fla. 32225

Mechanical Resources Inc., 191 Cambridge Avenue, Jersey City, N.J. 07307

George E. Meese, 194 Acton Rd., Annapolis, Md. 21403

Metritape, Inc., 33 Bradford Street, Concord, MA 01742

NKF Engineering Assoc., Inc., 8150 Leesburg Pike, Vienna, VA 22202

Nelson & Associates, Inc., 1405 N.W. 167th Street, Miami, FL 33169

Nickum & Spaulding Associates, Inc., 911 Western Ave., Seattle, WA 98104

Captain Conrad P. Nilsen, 66 Beverly Road, Bloomfield, NJ 07003

Norgard and Clark, 114 Sansome St., San Francisco, CA 94104

Ocean-Oil International Engineering Corporation, 3019 Mercedes Blvd., New Orleans, La. 70114

Offshore Power Systems, 8000 Arlington Expressway, Jacksonville, FL 32211

Oramer International Enterprises, Inc., P.O. Box 13069, Port Everglades, FL 33316

PRC Guralnick, 3252 Balboa Ave., San Diego, CA 92117

Pacific Industries Inc., 1440 Canal Street, Suite 1915, New Orleans, LA 70112

Penitens Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156

S.L. Petchul, Inc., 1380 SW 57th Ave., Fort Lauderdale, Fla. 33317

Pilgrage Consultants, Inc., P.O. Box 3, Atlantic Highlands, NJ 07716

M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013

and 657 Mission St., San Francisco, Calif

Sargent & Herkes, Inc., 611 Gravier St., New Orleans, La. 70130

Schmalz and Schmalz, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Florida 33316

Seacor Systems Engineering Associates, Corp., P.O. Box 2030, Cherry Hill Industrial Park, Perine Blvd., Cherry Hill, NJ 08003

Seaworthy Engine Systems, 36 Main Street, Essex, CT 06426

George A. Sharp, Inc., 100 Church St., New York, N.Y. 10007

T. W. Spaetgens, 156 West 8th Ave., Vancouver, Canada V5Y 1N2

R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235

Richard R. Toubler Inc., 2 Columbia St., Milford, Del. 19963

Thames Engineering Consultants Inc., P.O. Box 589, New London, Ct. 06320

Timco, 622 Azalea Road, Mobile, AL 36609

Corning Townsend III, 18 Church St., Georgetown, CT 06829

Wadsworth Maritime Helsinki Shipyard, P.O. Box 132, SF-00151, Helsinki 15, Finland

Wesley D. Wheeler Assoc., Ltd., 104 E. 40th St., Suite 206, New York, NY 10016

Thomas B. Wilson, 920 North Avalon Blvd., Wilmington, CA 90744

Wind Ship Development Corporation, 690 Main Street, Norwell, MA 02061

Wink Incorporated, 8020 Mayo Blvd., New Orleans, LA 70126

XPLO Corporation, 229 Fifth Street, Gretna, LA 70053

## NAVIGATION & COMMUNICATIONS EQUIPMENT

AAT Communications Corporation, 1854 Hylan Blvd., New York, NY 10205

American Hydromath Co., Buckwheat Bridge Rd., Germantown, N.Y. 12526

Applica Marine Electronics, Division of Raytheon, 876 Island Pond Rd., Manchester, NH 03103

Comsat General Corp., 950 L'Enfant Plaza, S.W., Washington, D.C. 20024

DEBEG Marine, Inc., 10 Manor Parkway, Salem, NH 03079

Electro-Nav Inc., 840 Bond Street, Elizabeth, NJ 07201

EPSCO, Inc., 411 Providence Highway, Westwood, Mass. 02090

Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080

Griffith Marine Navigation, Inc., 134 North Avenue, New Rochelle, NY 10801

Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913

Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631

ITT Mackay Marine, 2912 Wake Forest Road, Raleigh, N.C. 27611

Intermarine Electronics, Inc., Flowerfield Bldg. #7, St. James, N.Y. 11780

Iatron Corp., 5 Alfred Circle, Bedford, MA 01730

Kongsberg North America Inc., 135 Fort Lee Road, Leonia, NJ 07605

Kongsberg Vapenfabrikk, Nonarcont Division, P.O. Box 145, Horten 3191, Norway

Krupp Atlas-Elektronik, 241 Erie Street, Jersey City, NJ 07302

Magnavox Navigation Systems, 2829 Maricopa Street, Torrance, CA 90503

Maritel, Inc., 139 Old Salaman's Island Road, Annapolis, MD 21401  
 NavCom, Inc., 711 Grand Blvd., Deer Park, NY 11729  
 Navidyne Corp., 11824 Fishing Point Drive, Newport News, VA 23666  
 Navigation Communications Systems, Inc., 20100 Plummer Street, Chatsworth, CA 91311  
 North American Philips Communication Corp., 55 Knights Bridge Road, Piscataway, NJ 08854  
 RCA Service Co., Building 204-2, Camden, N.J. 08101  
 Rascal-Decca Marine, Inc., P.O. Box 5, #1 Commerce Blvd., Palm Coast, FL 32037  
 Radar Devices, Inc., 2955 Merced Street, San Leandro, CA 94577  
 Raytheon Marine Co., 676 Island Pond Road, Manchester, N.H. 03103  
 Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914  
 Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061  
 Simrad Inc., 1 Labriola Court, Armonk, N.Y. 10504  
 Southern Marine Research, Inc., 1401 N.W. 89th Court, Miami, FL 33172  
 Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.  
 Tracor, Inc., Industrial Products Div., 6500 Tracor Lane, Austin, Texas 78721

**OILS—Marine—Additives**  
 B. P. Marine North America Trading, Plaza 9, 900 Route 9, Woodbridge, NJ 07095  
 Ferox Corporation, P.O. Box 1764, Bellevue, WA 98009  
 Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001  
 Gulf Oil Trading Co., 1290 Ave. of Americas, New York, N.Y. 10019  
 Houston Marine Services, Inc., 505 Atrium One, 11811 1-10 East, Houston, TX 77029  
 Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002  
 Mobil Oil Corporation, 150 East 42nd St., New York, N.Y. 10017  
 Texaco, Inc. (International Marine), 135 East 42nd St., N.Y., N.Y. 10017

**OIL-WATER SEPARATORS**  
 Alfa-Laval, Inc., 2115 Linwood Avenue, Ft. Lee, NJ 07024  
 Butterworth Systems Inc., 224 Park Ave., Fairham Park, N.J. 07932  
 National Marine Service, Inc., 1750 Brentwood Blvd., St. Louis, MO 63144  
 Sigma Treatment Systems, 2 Davis Ave., Frozer, PA 19355

**PAINTS—COATINGS—CORROSION CONTROL**  
 American Abrasive Metals, 460 Coit Street, Irvington, NJ 07111  
 Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754  
 "CONSOL" manufactured by Harline Bros., Inc., 1400 Warner St., Baltimore, MD 21220  
 Davco Marine Coatings Co., P.O. Box 7600 Louisville, KY 40207  
 Eureka Chemical Company, 234 Lawrence Ave., So. San Francisco, CA 94080  
 Harkel Corporation, 4625 77th Street, Minneapolis, MN 55435  
 International Paint Co., 17 Battery Place North, Suite 1150, New York, N.Y. 10004  
 Jatum-Baltimore Copper Paint Co., 840 Key Highway, Baltimore, MD 21230  
 Mobay Chemical Corporation, Plastics & Coatings Div., Pittsburgh, PA 15205  
 Mobil Chemical Co., Maintenance & Marine Coatings Dept., P.O. Box 250, Edison, N.J. 08817  
 Palmer Products Inc., P.O. Box 8, Worcester, PA 19490  
 Selby, Botterby & Company, 5220 Whiby Avenue, Philadelphia, PA 19143

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

**PIPE-HOSE—Cargo Transfer, Clamps, Couplings, Coatings**  
 Comlock Flange Sales Corp., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696  
 CUNICO Corp., Cooney Pipe & Copper Works Div., 214 N. Hawaiian Ave., Wilmington, CA 90748  
 Hydro-Craft, Inc., 4223 Edgeland, Royal Oak, Mich. 48073  
 Kubota Ltd., 2-47, Shikui Suhigashi 1-Chome, Naniwa-Ku, Osaka 556-91, Japan  
 Penco Division Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030  
 Sanchez, Inc., 1600 South Canal Street, Chicago, IL 60616  
 Tiago Pipe & Supply Company, 2450 Wheatthief Lane, Philadelphia, PA 19137

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

**PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gasrs, Propellers, Shafts, Turbines**  
 Alco Power Inc., 100 Orchard St., Auburn, N.Y. 13021  
 Arnco Steel Advanced Materials Div., 703 Curtis St., Middletown, OH 45043  
 Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150  
 Bird Johnson Company, 110 Norfolk St., Walpole, Mass. 02081  
 Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark  
 Burmeister & Wain Diesel, Inc., 50 Broadway, New York, NY 10004  
 Caterpillar Tractor Company, Engine Division, Peoria, IL 61629  
 Centrico, Inc., 100 Fairway Court, Northvale, NJ 07647  
 Colt Industries' Fairbanks Morse Engine Division, Beloit, Wis. 53511  
 Combustion Engineering, Inc., Windsor, Connecticut 06095  
 General Electric Co., Diesel Power Products, 2901 E. Lake Rd., Erie, PA 16531  
 Kawasaki Heavy Industries, Ltd., 2-4-1 Hamamtsu-cho, Minato-ku, Tokyo, Japan  
 MTR of North America, Inc., 10450 Corporate Drive, Sugar Land, TX 77478  
 Maritime Industries, Ltd., 6307 Laurel St., Burnaby, B.C. Canada V5B 3B3  
 Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507  
 Omnithruster Inc., 15418 Cornet Ave., Santa Fe Springs, CA 90670  
 Oosterhuis Industries, Inc. (Marine Engineering, Inc.), P.O. Box 30587, New Orleans, LA 70190  
 P.J. Plishner Marine, 2 Lake Avenue Ext., Danbury, CT 06810  
 Port Electric Turbine Div., 155-157 Perry St., New York, N.Y. 10014  
 Propulsion Systems Inc., 21213 70th Ave., So. Kent, WA 98031  
 Schottel of America, Inc., 8375 N.W. 56 Street, Miami, Fla. 33166  
 Skinner Engine Company, P.O. Box 1149, Erie, PA 16512  
 Stearns Corporation, 1020 East 8th Street, Jacksonville, FL 32206  
 Tacoma Boat Co./Escher Wyss, 1840 Marine View Dr., Tacoma, WA 98422  
 Transamerica Delaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621  
 Transamerica Delaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, N.J. 08650  
 Turbine Specialties, Inc., P.O. Box 207, West State Street Road, Salina, KS 67401  
 Vajih Schneider of America—U.S. Agent: Eli Sharprut, 347 Evelyn St., Paramus, N.J. 07652

**PUMPS—Repairs—Drivers**  
 Barco Corporation, 16 Bahama Circle, Tampa, FL 36606  
 Penco Division Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030  
 Transamerica Delaval, IMO Pump Division, P.O. Box 447, Monroe, NC 28110

**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, Hanesdale, Pa. 18431  
 Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008  
 Somson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110

**RUBBER ANGLE INDICATORS**  
 Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142  
 Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913  
 Hase McCann Telephone Co., Inc., 324 W. 23rd St., N.Y. 10011  
 Modular Systems, 164 Franklin Avenue, Rockaway, NJ 07866  
 Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

**SAFETY EQUIPMENT**  
 ACR Electronics, Inc., 3901 North 29th Avenue, Hollywood, FL 33020  
 Datrex, 3770 N.W. So. River Drive, Miami, FL 33142

**SANITATION DEVICES—Pollution Control**  
 Argo Marine Pollution Systems Division, 140 Franklin St., New York, N.Y. 10013  
 Chapman Engineers (Omnigurg Division), 6101 Southwest Freeway, Suite 100, Houston, TX 77057  
 Envirovac (Division of Dometic Inc.), 1260 Turret Drive, Rockford, IL 61111  
 Marine Moisture Control Co., Inc., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696  
 Marland Environmental Systems, Inc., N. Main Street, Walworth, WI 53184  
 Microphar, Inc., P.O. Box 490, Willis, CA 95490  
 Red Fox Industries, P.O. Drawer 640, New Iberia, LA 70560  
 St. Louis Ship FAST Sewage Systems, 611 East Marceau St., St. Louis, Mo. 63111  
 Sigma Treatment Systems, 2 Davis Ave., Frozer, PA 19355  
 Somat Corporation, Pomeroy, PA 19367

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

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

**SHAFT SEALS, REVOLUTION INDICATOR EQUIPMENT**  
 Bird-Johnson Co., 100 Norfolk St., Walpole, MA 02081  
 Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142  
 Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913  
 Penco Division Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

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

**SHIPBUILDING STEEL**  
 Arnco 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.), Moatschoppij bv, P.O. Box 3006, 1003 AA, Amsterdam, Holland  
 AMT, Inc., 2400 N.W. 39th Avenue, Miami, FL 33142  
 Asmar Shipyards Co., Astilleros y Maestranas de la Armada, Pte 856, Piso 14, Casilla 150 V, Valparaiso, Chile, S.A.  
 Astilleros Espanoles S.A., 17 Padilla, P.O. Box 815, Madrid, Spain  
 Astilleros Unidos de Veracruz, S.A., San Juan de Ulua S. N., Apdo. Postal 647, Veracruz, Ver., Mexico  
 Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150  
 Bay Shipyards Corporation, 605 North Third Avenue, Sturgeon Bay, WI 54253  
 Bender Shipbuilding & Repair, P.O. Box 42, Mobile, AL 36601  
 Birge Industries Inc., P.O. Box 38, St. Bernard, La. 70085  
 Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004  
 Blohm & Voss Company, 55 Morris Avenue, Springfield, NJ 07081  
 Bludworth Bond Shipyards Inc., P.O. Box 5065, Houston, TX 77012  
 Boeing Marine Systems, P.O. Box 3207, Mail Stop 14 11, Seattle, WA 98124  
 Cantarelli Riuniti, Via Cipro, 11, 16100 Genova, Italy  
 Carrington Shipways Pty, Ltd., Old Punt Road, Tamago, N.S.W. Australia 2222  
 Centamar, One World Trade Center, Suite 3557, New York, N.Y. 10048  
 City Shipbuilding Corp., c/o Allargo Transportation Supply Co., One Penn Plaza, Room 1606, New York, NY 10119  
 Conrad Industries, P.O. Box 790, Morgan City, La. 70350  
 Curacao Drydock Company, Inc., 26 Broadway, Suite 741, New York, NY 10004  
 Dorbyl Ltd., Military Road, 1 Industrial Sites, West Bank, 5201 East London Republic of South Africa  
 Dravo Steelship Corp., R.A. Box 167, Pine Bluff, Ark. 71602  
 Equitable Shipyards, Inc., P.O. Box 8001, New Orleans, La. 70122  
 FMC Co., Marine Equipment Div., 4700 N.W. Froat Ave., Portland, Oregon 97208  
 Galveston Shipbuilding Co., P.O. Drawer 2660, Galveston, TX 77553  
 HBC Barac, Inc., Grant Building, Pittsburgh, PA 15219  
 Halifax Industries Ltd., P.O. Box 1477, Halifax, Nova Scotia, Canada, B3K 5H7  
 Halter Marine, Inc., P.O. Box 29266, New Orleans, La. 70189  
 Havre de Grace, Havre de Grace, Md. 21058  
 Hitachi Shipbuilding & Engrg. Co., Ltd., 47 Edobori 1-Chome, Nishi-Ku, Osaka, Japan  
 Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong  
 Hudson Shipyards, Inc., P.O. Box Q, Pascagoula, MS 39567  
 Jeffboat, Inc., Jeffersonville, Ind. 47130  
 Livingston Shipbuilding, P.O. Box 968, Orange, TX 77630  
 Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134  
 McDermott Incorporated, 1010 Common Street, New Orleans, LA 70160  
 MacGregor Land & Sea, Inc., 135 Dermody Street, Cranford, NJ 07016  
 Marine Fabricators, P.O. Box 246, Green Cove Springs, FL 32043  
 Mottan Shipyards Co., Inc., P.O. Box 645, Cohoes, New York 12047  
 Midland Marine Corporation, One Pennsylvania Plaza, New York, NY 10001  
 Misener Industries, Inc., 5353 Tyson Avenue, P.O. Box 13625, Tampa, Fla. 33681  
 Monark Boat Co., P.O. Box 210, Monticello, Ark. 71655  
 Nashville Bridge Company, P.O. Box 239, Nashville, TN 37202  
 National Steel & Shipbuilding Corp., San Diego, Calif. 92112  
 Newark Shipbuilding & Repair, P.O. Box 5426, Houston, TX 77012  
 Newport News Shipbuilding & Dry Dock Co., 4101 Washington Ave., Newport News, Va. 23607  
 O.A.R.N. (Officine Allestimento-Riparazioni Navil), P.O. Box 1395, Genoa, Italy 16100  
 Pececa Inc. (A division of Fruehauf), West Seaway Access Road, Guilford, MS 39501  
 Pearson Engineering Co., P.O. Box 8, Kendall Branch, Miami, Fla. 33156  
 Port Allen Marine Service, Inc., P.O. Box 108, Port Allen, LA 70767  
 Progressive Shipbuilders & Fabricators, Inc., P.O. Box 9130, Houma, LA 70361  
 Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22

St. Louis Shipbuilding—Federal Barge, Inc., 611 East Marceau, St. Louis, Mo. 63111  
 Savannah Shipyard Co., P.O. Box 787, Savannah, GA 31402  
 Southwest Marine, Inc., P.O. Box 13308, San Diego, Ca 92113  
 Sudaimport, 5 Kalyaevskaya, Moscow K-6, USSR  
 Sun Ship Inc., Chester, PA 19013  
 Swiftships Inc., P.O. Box 1905, Morgan City, LA 70380  
 Tacoma Boatbuilding Co., Inc., 1840 Marine View Drive, Tacoma, WA 98472  
 Tandano (Placentini), Antartida Argentina 555 Darsena Norte, 1101 Buenos Aires-Republica Argentina  
 Thomas Marine Inc., 37 Bransford Street, Patchogue, NY 11772  
 Todd Shipyards Corp., 1 State St. Plaza, New York, N.Y. 10004  
 Total Transportation Systems Inc., 813 Forest Dr., Newport News, VA 23606  
 Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 28, N5201 Oslo, Norway  
 Tracor Marine, P.O. Box 13107, Port Everglades, Fla. 33316  
 Tug Barge Systems, Inc., subsidiary of Ingram Corp., 4100 One Shell Square, New Orleans, La. 70139  
 Union Dry Dock & Repair Co., Foot of Pershing Road, Weehawken, N.J. 07087  
 Wiley Manufacturing, a unit of AMCA International Corp., P.O. Box 97, Port Deposit, MD 21904

**SHIPPING**  
 Candia Shipping (USA) Inc., One World Trade Center, Suite 1611, New York, NY 10048

**SHIP STABILIZERS**  
 Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

**SMOKE INDICATORS**  
 Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928

**STUFFING BOXES**  
 Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44042

**SURVEYORS AND CONSULTANTS**  
 Francis B. Crocco, Inc., P.O. Box 1411, San Juan, Puerto Rico 00903  
 Hull & Cargo Surveyors, Inc., 99 John St., New York, NY 10038

**TANK CLEANING**  
 Butterworth Systems Inc., 224 Park Ave., P.O. Box 352, Fairham Park, N.J. 07932  
 Environmental Chemicals, Inc., 487 Division Street, Boonton, NJ 07005  
 Penco Division Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030  
 Solwico, Inc., 5 Marine View Plaza, Hoboken, NJ 07030

**TANK LEVELING INDICATORS**  
 Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06052  
 Vu-Gage System, 150 E. 42nd St. (Room 910), New York, NY 10017

**TERMINALS—Oil-Transfer**  
 Calcas Petroleum Services Div., Federal Chicago Corp., 2222 North Elston Avenue, Chicago, IL 60614  
 Transportation Concepts & Techniques Inc., 1020 West Main Street, Charlottesville, VA 22902

**TOWING—Barges, Vessel Chartering, Lighterage, Salvage, etc.**  
 Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002  
 Chafin Transportation, Inc., 580 Walnut St., Cincinnati, Ohio 45202  
 Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md. 21202  
 Henry Gillen's Sons Lighterage, 21 West Main St., Oyster Bay, N.Y. 11771  
 Great Lakes Towing Company, 1800 Terminal Tower, Cleveland, OH 44113  
 Gulf Fleet Marine Corporation, Canal Place One, Suite 2400, New Orleans, LA 70130  
 James Hughes, Inc., 17 Battery Pl., New York, N.Y. 10004  
 McAllister Bros., Inc., 17 Battery Pl., New York, N.Y. 10004  
 McDonough Marine Service, P.O. Box 26206, New Orleans, La.  
 Morgan Towing & Transportation Co., Inc., One World Trade Center, Suite 3335, New York, N.Y. 10048  
 Ocean Salvors Company, One World Trade Center, New York, NY 10048  
 Smit International (Americas) Inc., 17 Battery Place, New York, NY 10034  
 Suderman & Young Co., Inc., 918 World Trade Bldg., Houston, Texas 77002  
 Tugboat & Harbor Towing Corp., One Edgewater St., Clifton, Staten Island, N.Y. 10305

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

**VALVES AND FITTINGS**  
 American United Marine, 575 Madison Avenue, New York, NY 10022  
 Deyer Corporation, Norris Division, P.O. Box 1739, Tulsa, OK 74101  
 Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07207  
 Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696  
 Marland Environmental Systems Inc., N. Main St., Walworth, WI 53184  
 Parker-Hannifin Corporation, 17325 Euclid Avenue, Cleveland, OH 44112  
 Voss, Inc., Building J, 7029 Huntley Road, Columbus, Ohio 43229  
 Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928  
 Washketo Bearings Corp., P.O. Box 798, Waukegan, WI 53186  
 Winel, Inc., 34655 Mills Road, North Ridgeville, OH 44039

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

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

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

**WIRE AND CABLE**  
 Anixter Bros., Inc., 4711 Golf Road, One Concourse Plaza, Skokie, Illinois 60076  
 Seacoast Electric Supply Corp., 225 Passaic St., Passaic, NJ 07055  
 Seacoast Electric Supply Corp., 1505 Oliver St., Houston, TX 77007

**WIRE ROPE—Slings**  
 Arnco Steel Corp., 703 Curtis St., Middletown, Ohio 45042  
 Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004

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

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

# U.S. SHIP CONSTRUCTION CONTRACTS

## 1 — MERCHANT VESSELS UNDER CONSTRUCTION OR ON ORDER AT U.S. YARDS — JULY 1, 1981

Builder	Owner	Total No.	Type	Hull Nos.	Est. GT (Each)	Est. DWT (Each)	Est. HP (Each)	Est. Total Cost (\$Mil.)
Avondale Shipyards	American President Lines	3	Container	2329-31	40,500	30,300	D-43,200	330.0
	Suwanee River	1	Tug/Barge	2327-8	16,000	41,300	D-18,200	37.7
	Ogden Marine	2	Products	2318 19	25,000	42,000	D-15,000	100.0
	Corps of Engineers	1	Dredge	2322	9,900	8,000	D-10,400	67.5
	United States Trust	1	Dredge	2332	—	9,980	D-13,800	40.0
Bath Iron Works	Exxon Company U.S.A.	3	Products	—	26,000	43,000	D-17,000	300.0
	Corps of Engineers	1	Dredge*	402	6,000	—	D 7,000	65.0
	Falcon I Sea Transport	2	Tanker	404-5	24,000	33,900	D-14,720	142.0
Bay Shipbuilding	Calif. & Hawaii Sugar	1	Barge*	406	21,000	37,000	—	25.0
	Baker Shipping	1	Bulk Barge	728	20,000	41,000	—	NA
	Universal American Barge	1	Bulk Barge	729	17,500	33,000	—	NA
Bethlehem-Sparrows Point	Ocean Barge	1	Bulk Barge	730	17,500	33,000	—	NA
	Artemis Marine	1	Tug/Barge	4652	32,000	47,000	D-18,200	52.6
Equitable Shipyards	First-Fifth Tug/Barge	5	Tug/Barge	4653-7	32,000	47,000	D-18,200	266.0
	City of New York	2	Ferry	1713-14	3,000	4,200	D-7,800	30.0
General Dynamics-Quincy	Coastwise Shipping	4	Tank Barge	73-75, 82	—	27,000	—	57.0
	New England Electric	1	Collier	—	23,500	36,000	T-12,000	60.0
	Watermanship Steamship	1	RO/RO-Cont.*	85	18,500	23,500	T-32,000	61.0
Levingston Shipbuilding	Asco Falcon I	2	Bulk	752-3	23,500	36,000	D-14,800	80.0
National Steel & SB	Union Oil	2	Products	416-17	24,500	37,500	T-13,000	100.0
	American Tankships	2**	Products	419-20	24,500	37,500	D-11,400	102.0
	American Trading Trans.	3	Products	424-6	27,000	44,000	D-11,400	153.0
Norfolk Shipbuilding	Coordinated Caribbean	1	Barge	34	4,000	6,680	—	21.2
Southern Shipbuilding	Great Lakes Dredge	1	Dredge	120	3,300	4,400	D-3,000	NA
Sun Ship, Inc.	Products	1	Products	677	17,000	31,000	D-14,200	36.0
	Sun Transport	2	RO/RO-Cont.	679-80	18,500	23,500	T-32,000	137.5
Upper Peninsula SB	Waterman Steamship	2	RO/RO-Cont.	679-80	18,500	23,500	T-32,000	137.5
	State of Michigan	1/4	Tug(1)/Barge(4)	001-5	5,400	10,000	D-8,000	35.5
Wiley Manufacturing	American Dredging	1	Dredge	104	2,500	3,750	D-7,200	NA
	Texas Gulf	1	Dredge	108	2,800	3,800	DE	NA

\* Subcontracted from Sun Ship. \*\* Option for three additional sister ships.

## 2 — OFFSHORE DRILLING RIGS UNDER CONSTRUCTION OR ON ORDER AT U.S. YARDS — JULY 1, 1981

Builder	Owner	Name	Type	Delivery	
Alabama Maritime Mobile, Ala.	Diamond M	Diamond M. Hunter	Semisub.	11/81	
	"	Diamond M. Eagle	"	4/82	
Baker Marine Ingleside, Texas	Huthnance Dig.	Charger I	Jackup	8/81	
	Huthnance Dig.	Charger II	"	10/81	
	Magnum Marine	Mr. Demp	"	11/81	
	Magnum Marine	Robert N. Haskin	"	5/82	
	Magnum Marine	Robert W. Womack	"	6/82	
	Marine Drilling	J. Storm XV	"	4/81	
	Pool Offshore	Pool Offshore Rig 53	"	6/81	
	Savage Drilling	Pool Offshore Rig 54	"	12/81	
	Griffin-Alexander	Ponca	"	8/82	
	Bethlehem Steel Beaumont, Texas	Griffin-Alexander	Griffin-Alexander V	Jackup	5/82
"		Griffin-Alexander VII	"	9/82	
"		Griffin-Alexander VIII	"	3/82	
Houtech Energy		Houtech I	"	8/81	
"		Houtech II	"	10/81	
"		Houtech III	"	3/82	
"		Houtech IV	"	9/82	
Marine Drilling		J. Storm XVI	"	9/81	
O & U Drilling		J. Storm XVII	"	9/81	
Teledyne		Nordrill II	"	1/82	
Bethlehem Steel Sparrows Point, Md.	Alfa Drilling	Mobile 20	"	11/82	
	Griffin-Alexander	(unnamed)	"	1/83	
	Griffin-Alexander	Griffin-Alexander III	Jackup	10/81	
Chicago Bridge & Iron Pascagoula, Miss.	Griffin-Alexander	Griffin-Alexander IV	"	3/82	
	Griffin-Alexander	Griffin-Alexander VI	"	6/82	
	Temple Drilling	Cheyenne	"	4/82	
	Dixilyn-Field	DF-77	Jackup	6/82	
	Blocker Drilling	(unnamed)	Submersible	10/82	
General Dynamics Charleston, S.C.	Blocker Drilling	(unnamed)	"	2/83	
	Bailey & Shannon Inc.	Bill Bailey	Jackup	10/81	
	"	Bob Warner	"	12/81	
	"	Burr Rayburn	"	4/82	
	"	Herb Williamson	"	6/82	
Gulfport Shipbuilding Fort Arthur, Texas	"	Mark Jones	"	1982	
	"	Mr. Webster	"	1982	
	Compania	Perforadora	Jackup	5/82	
	Ingalls Shipbuilding Pascagoula, Miss.	Transworld Drilling	Transworld 70	Submersible	8/81
		"	Transworld 72	"	12/81
		"	Transworld 73	"	2/82
		Bonito Offshore	Bonito I	Jackup	3/82
		"	Bonito II	"	12/82
		Chiles Drilling	Yucatan	"	9/81
		Global Marine	Glomar Main Pass I	"	11/81
"		Glomar Main Pass II	"	1/82	
"		Glomar Main Pass III	"	5/82	
"		Glomar Main Pass IV	"	9/82	
Huthnance Drilling	Vanguard I	"	9/81		
	Vanguard II	"	10/82		
	Keyes Offshore	Keyes 301	"	8/81	
	"	Keyes 302	"	9/81	
	"	Keyes 303	"	7/82	
Levingston Shipbuilding Orange, Texas	Dixilyn-Field	DF-87	Jackup	8/81	
	Noble Drilling	Ed Holt	"	11/81	
	Compania Perforadora	(unnamed)	"	12/82	

## 2 — OFFSHORE DRILLING RIGS UNDER CONSTRUCTION OR ON ORDER AT U.S. YARDS — JULY 1, 1981 (Con.)

Builder	Owner	Name	Type	Delivery
Marathon LeTourneau Brownsville, Texas	Chiles Drilling	Seabee	Jackup	3/83
	Global Marine	Glomar Adriatic II	"	9/81
	"	Glomar Adriatic V	"	8/83
	"	Glomar Adriatic VI	"	10/83
	"	Glomar Adriatic VII	"	1/84
	Penrod Drilling	Penrod 86	"	2/82
	"	Penrod 88	"	5/82
	"	Penrod 90	"	8/82
	"	Penrod 98	"	4/84
	"	(unnamed)	"	12/82
Marathon LeTourneau Vicksburg, Miss.	Rowan Drilling	Penrod 87	Jackup	5/82
	Penrod Drilling	Penrod 89	"	9/82
	"	Penrod 91	"	1/83
	"	Penrod 99	"	4/84
	Rowan Drilling	Arch Rowan	"	9/81
	"	Gilbert Rowe	"	10/81
	"	Cecil Province	"	2/82
	Rowan Drilling	(unnamed)	Jackup	12/83
	"	(unnamed)	"	11/84
	"	(unnamed)	"	3/85
Vemar Shipyard Channelview, Texas	"	(unnamed)	"	1985
	Atwood Oceanics	Richmond	Submersible	9/81
	Cliffs Drilling	(unnamed)	Jackup	9/81
	Penrod Drilling	Penrod 170	Submersible	11/81
	"	Penrod 171	Submersible	4/82
Macan Offshore	Penrod 172	Submersible	8/82	
	(unnamed)	Jackup	4/82	
	(unnamed)	Submersible	3/83	

## 3 — MAJOR U.S. NAVAL VESSELS UNDER CONSTRUCTION OR ON ORDER AT U.S. YARDS — JULY 1, 1981

Builder	Type	Navy Nos.	No.	Est. Contract Value, \$Mil.
Avondale Shipyards	Fleet Oiler	AO-178-9	2	\$144.0
	"	AO-180, 186	2	146.2
Bath Iron Works	Guided-Missile Frigate	FFG-21, 24, 26	3	178.2
	"	FFG-29, 32, 34	3	147.0
	"	FFG-36, 39, 42	3	209.9
Boeing Marine Systems	"	FFG-45, 47, 49	3	195.4
	Missile Patrol Hydrofoil	PHM-2	1	21.3
	"	PHM-3-6	4	178.0
GD-Electric Boat	Attack Submarine	SSN-699	1	428.0
	"	SSN-700-4	5	2,171.4
	"	SSN-705-10	6	2,605.6
	"	SSN-719-20	2	—
	Trident Submarine	SSBN-726	1	285.4
	"	SSBN-727-9	3	699.4
	"	SSBN-730	1	354.5
	"	SSBN-731-2	2	699.0
	"	SSBN-733	1	401.0

3 — MAJOR U.S. NAVAL VESSELS UNDER CONSTRUCTION  
OR ON ORDER AT U.S. YARDS — JULY 1, 1981 (Con.)

Builder	Type	Navy Nos.	No.	Est. Contract Value, \$Mil.
Ingalls Shipbuilding	Missile Destroyer	DDG-994-6	3	1,050.0
	Destroyer	DD-997	1	231.0
	Aegis Missile Cruiser	CG-47	1	287.8
	"	CG-48	1	298.0
Lockheed Shipbuilding	Sub. Tender	AS-41	1	209.5
	Dock Landing Ship	LSD-41	1	338.6
Marinette Marine	Fleet Ocean Tug	T-ATF-172	1	8.4
National Steel & SB	Destroyer Tender	AD-42-4	3	520.0
	Cable Repair Ship	T-ARC-7	1	107.0
Newport News SB	Attack Carrier	CVN-70-71	2	1,718.6
	Attack Submarine	SSN-712-15	4	388.0
	"	SSN-716-18	3	380.8
Peterson Builders	Patrol Gunboats **	F-PGG-2-9	8	70.1
Tacoma Boatbuilding	Missile Patrol Chaser **	F-PCG-1-4	4	52.5
	Med. End. Cutter*	WMEC-901-4	4	130.0
Todd-San Pedro	Guided Missile Frigate	FFG-19, 23, 25	3	151.0
		FFG-27, 30, 33	3	147.0
		FFG-38, 41, 43	3	214.8
		FFG-46	1	67.7
Todd-Seattle	Guided-Missile Frigate	FFG-18	1	49.6
		FFG-20, 22	2	100.7
		FFG-28, 31, 35	3	147.0
		FFG-37, 40	2	143.2
		FFG-44, 48	2	135.3

\*For U.S. Coast Guard. \*\*For Saudi Arabia.



Dravo SteelShip Delivers  
Two Crane Boats To Weber Marine

Dravo SteelShip Corporation, Pine Bluff, Ark., recently delivered two 60-foot by 22-foot by 9.5-foot crane boats to Weber Marine, Incorporated of Burnside, La.

These new boats, the MAR-LO, and the GOOG-E (shown above), are powered by twin GM 12V-71 diesel engines rated at 340 hp each. The engines are equipped with Twin Disc MG514, 6:1 reduction gears. Fernstrum keel coolers provide for main engine and generator set jacket water cooling.

Twin GM 3-71 engines with 30-kw generators supply ship's power which includes Perko 1,000-watt incandescent searchlights,

Nabrico 20T deck winches, Ingersoll Rand air compressors and owner-furnished electronics which are by Eagle Electronics of Baton Rouge, La.

Main engines and generator sets were supplied by Wilkerson Diesel of Little Rock, Ark.

The Model 10-2-50 Nautelek marine hydraulic deck crane furnished by Green Marine of Metairie, La., has a 20-foot boom with an extended reach of 50 feet and a maximum lift capacity of 10 tons.

The steering system is a Dravo SteelShip standard designed full follow-up mechanical over hydraulic with a Flow Systems power unit.

August 1, 1981

Each vessel is equipped with two Kahlenberg four-blade, stainless-steel, 60-inch by 48-inch propellers.

Tank capacities onboard each vessel are: fuel, 7,500 gallons; clean lube oil, 150 gallons; potable water, 500 gallons, and bilge, 500 gallons.

The main deck cabin provides for sheltered equipment storage

with free access to open cargo deck area.

Crane boats are but one of Dravo SteelShip's product lines which include towboats, tugboats, utility vessels, pilot boats, and special barges.

Currently, Dravo SteelShip is building two 65-foot towboats with 1,200 horsepower and a series of 85-foot towboats with 2,100 horsepower.

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**Port Engineer**—You're degreed in Marine Engineering, have a Chief's license U. S. C. G., and a minimum 10 years sea-going experience. Responsibilities: provide Manager, Marine Engineering, with continuing evaluations of operating conditions of moving equipment on board SOHIO fleet vessels—as overall operation relates to satisfactory and safe engineering practice.

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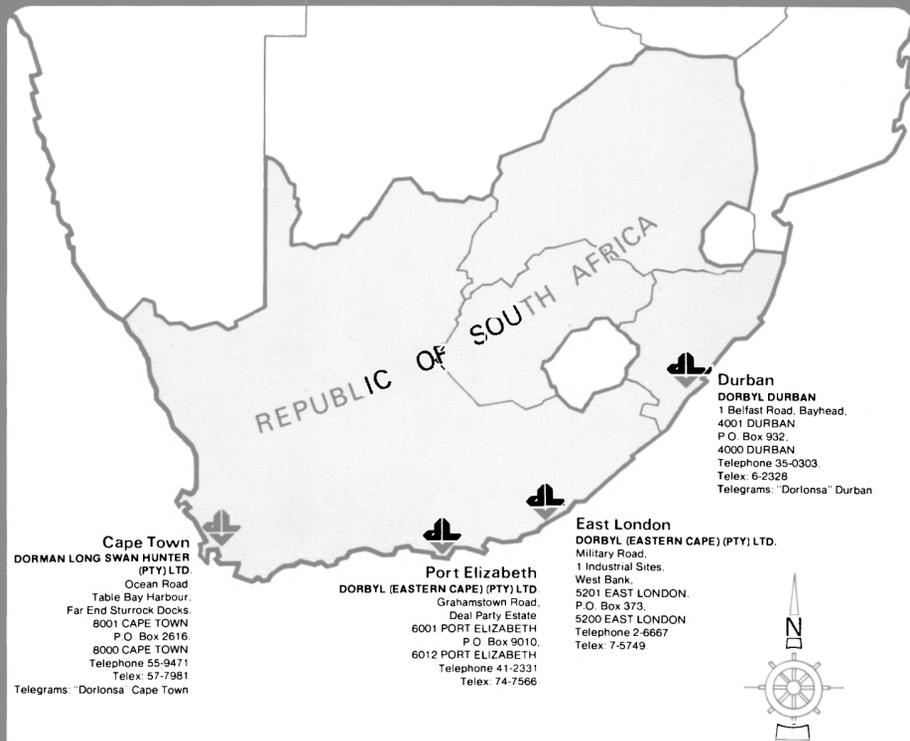
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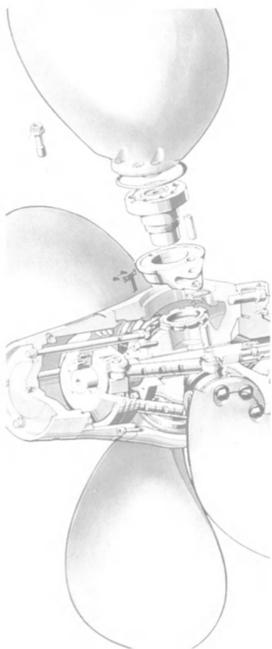
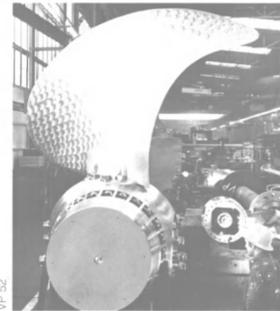
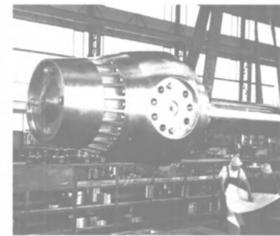
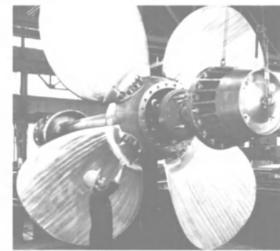
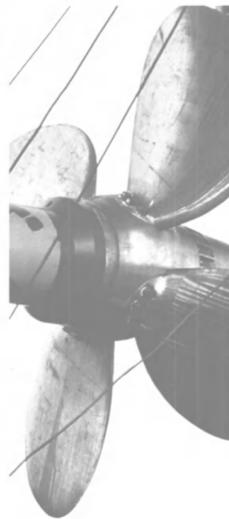
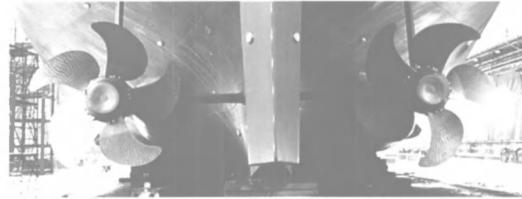
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