MARITIME REPORTER
AND
ENGINEERING NEWS

M.A.N.–GHH Sterkrade constructed drydock for Continental Maritime

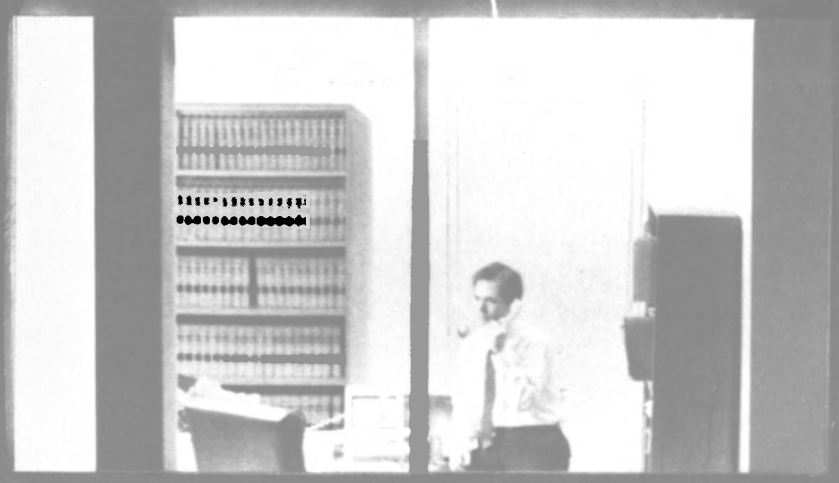
Expoship Riomar Preview
Shiplift & Drydock Review
(SEE PAGE 4)

SEPTEMBER 1, 1985

Bad news travels fast by satellite, which is a very good thing.

"Data we're receiving from your ship indicates that due to the weather out there, you should adjust heading and ballast as follows...

"It'll put you into San Francisco ahead of schedule."

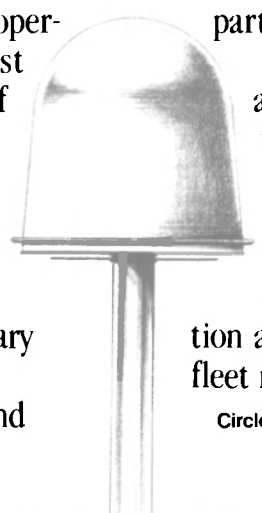


"Thanks for the info. If you can have the following parts waiting at the dock when we get there it'll really speed things up."

A conversation like this one, via satellite between a fleet operator and one of his ships halfway around the world, can take just seconds. And when you figure an average ship burns millions of dollars of fuel a year, these few seconds adjusting heading and ballast, relative to ship movement, can save thousands.

It's all possible with COMSAT Maritime Services via INMARSAT, a satellite communications network which keeps fleet operators in constant touch with their ships.

Through an inexpensive personal computer and an ordinary phone call or telex transmission, you can exchange weather information, market developments, optimum shipping routes and parts availability. Instantly, reliably and privately.



You can keep your finger on such vital signs as engine operation and fuel usage. Sensors can pick up malfunctions and relay them back even before the crew is aware there's a problem.

In a business where speed is often the competitive edge, every minute you can save makes a difference. Call COMSAT toll-free at 1-800-424-9152. We'll provide complete satellite communications information and help you manage your fleet more efficiently worldwide.

COMSAT Maritime Services

950 L'Enfant Plaza, S.W., Washington, D.C. 20024

Circle 327 on Reader Service Card

ON THE COVER

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Northwest Marine Awarded $12.3-Million Navy Contract To Overhaul Destroyer

Northwest Marine Iron Works of Portland, Ore., has been awarded a $12,351,551 fixed-price-incentive Navy contract for the regular overhaul of the destroyer USS Cushing (DD-985). Work is expected to be completed by July 17, 1986. Contract funds would have expired at the end of the current fiscal year. Seven bids were solicited and four offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-R-8523).

Ground Broken For New Siemens-Allis Headquarters Building In Georgia

Siemens-Allis Inc. recently held a ground-breaking ceremony for its new national headquarters building in Alpharetta, Ga., about 25 miles north of downtown Atlanta. Presiding over the event was **Harry S. Burker Jr.,** Siemens-Allis president and chief executive officer, who was welcomed to the Alpharetta community by Mayor **Jimmy Phillips.** Occupancy of the five-story, 120,000-square-foot building is scheduled for the fall of 1986.

Siemens-Allis, a manufacturer of electrical and electronic equipment and systems, has been based in Atlanta since 1978. Jointly owned by Siemens and Allis-Chalmers, the company has facilities throughout the U.S. and its products are marketed worldwide.

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

Tidewater Marine Acquires 5 Vessels From Otto Candies

Tidewater Inc.'s marine subsidiary, Tidewater Marine Service, Inc., has completed an agreement to purchase a package of five vessels from Otto Candies, Inc. of Des Allemands, La.

According to an announcement by **John P. Laborde,** Tidewater chairman and chief executive officer, on 135-foot, 5,600-bhp tug; three 105-foot, 3,600-bhp tugs; and one 300-foot offshore deck cargo barge will be acquired from Candies in exchange for approximately 600,000 shares of Tidewater common stock. Candies is a major provider of marine support services for the offshore oil and gas industry.

It is anticipated that three of the vessels will join Tidewater Marine's foreign fleet. The remaining tug and cargo barge will be placed in service in the Gulf of Mexico.

In addition to owning and operating one of the world's largest fleets of vessels supporting the offshore oil and gas industry, Tidewater is active in oil and gas exploration and production, and in the air and natural gas compression business.

Mathers Wins $1-Million Contract For Control Systems For 16 Cutters

A $1-million contract has been awarded to Mathers Controls Inc. to manufacture the propulsion control system for 16 Coast Guard cutters.

The contract calls for the Seattle-based firm to supply an engine room console, pilothouse console, two bridge wing consoles, two local engine control panels and a variety of components and sensors for each of the 210-foot Medium Endurance Cutters. The existing fleet of 16 ships is scheduled for complete overhaul during the next several years under the Coast Guard fleet Revitalization and Modernization Program.

Literature is available on the full line of Mathers controls. For a free copy,

Circle 67 on Reader Service Card

American Air Filter Offers New Brochure On Cartridge Filters

Newly revised literature from American Air Filter, an Allis-Chalmers company, is now available on AMER-kleen cartridge filters for marine and stationary applications.

The AMER-kleen cartridge filter is a glass fiber filter that successfully cleans the intake air for high-horsepower engines. Characteristics of AMER-kleen cartridge filters make them ideally suited for cleaning the intake air to engines located in most climates. Features include high filtering efficiency, high dust holding capacity, low operating cost, ease of installation and maintenance, and long service life.

The eight-page, four-color brochure, illustrated with photographs and drawings, discusses the filter's advantages and gives test procedures, performance data and sizing information.

For a free copy of "Marine AMER-kleen Cartridge Filters for Marine and Stationary Applications,"

Circle 43 on Reader Service Card

Hawker Siddeley/Kongsberg Collaborate In Venture —Literature Available

Hawker Siddeley Dynamics Engineering Limited and Kongsberg Limited have entered into an agreement to establish a joint international marketing and sales venture for computer-based dynamic positioning and machinery control systems for naval vessels.

A complete systems approach for platform control of naval vessels will be provided by the two companies. The Albatross division of Kongsberg is a market leader in dynamic positioning systems; Hawker Siddeley Dynamics Engineering is a major supplier of machinery automation equipment, such as computer-based integrated steering and propulsion control systems.

For free literature,

Circle 72 on Reader Service Card

Big Supply Vessel 'Nicor Sailor' Converted By Eastern Marine

The Nicor Sailor (ex-Acadian Sailor) is now one of the largest-capacity supply boats in the Gulf of Mexico. This Nicor Marine vessel (shown above), which suffered an on-board fire in the Gulf in April 1984, has been completely rebuilt for a new assignment—to haul supplies for drilling operators exploring for oil and gas in deepwater Gulf tracts.

The new Sailor, rebuilt by Eastern Marine, Inc. of Panama City, Fla., boasts features demanded most for deepwater supply work—a silicon-controlled rectifier (SCR) diesel-electric propulsion system, exceptional below-deck cargo capacities, and one of the largest open deck cargo areas available in the Gulf today. Capacities include 6,360 cubic feet of bulk mud and cement, 2,094 barrels of liquid mud, 148,004 gallons of fuel oil, 6,879 barrels of drill water, 44,760 gallons of potable water, and 800 long tons of deck cargo.

The rebuilt vessel has an overall length of 217 feet, beam of 44 feet, draft of 13.5 feet, and can accommodate a crew of 23. The clear deck measures 146 by 36 feet.

Since its founding in 1976, Eastern Marine has built a reputation as one of the industry's most respected shipbuilders. "The high quality of workmanship displayed at Eastern Marine resulted in our taking delivery of a vessel clearly superior to the Sailor when newly built, "said **Glen Fornell**, Nicor Marine president.

Despite the complexities of the extensive rebuilding job, the shipyard delivered the Sailor on schedule. The seven-month project included rebuilding the engine and SCR control rooms; replacing all equipment and fixtures in the galley, staterooms, and common areas, as well as all bridge electronic equipment and fixtures; refurbishing auxiliary equipment, pumps, and motors; and reconfiguring the vessel for offshore supply service with wood decking on the main deck, cargo rails, and refurbished bulk mud system.

Eastern Marine also installed a fixed Halon fire-fighting system for machinery spaces, and four large-capacity, liquid-mud tanks and related pumping equipment. All main diesel generator sets were replaced or rebuilt.

The Nicor Sailor has been completely recertified by the U.S. Coast Guard and the American Bureau of Shipping.

Gibson-Smith Appointed President Of BP Alaska Exploration

BP Alaska Exploration Inc. has announced the appointment of Dr. **Chris S. Gibson-Smith** as president. The company, headquartered in San Francisco, is a subsidiary of BP North America Inc., with responsibility for oil exploration and production in the U.S.

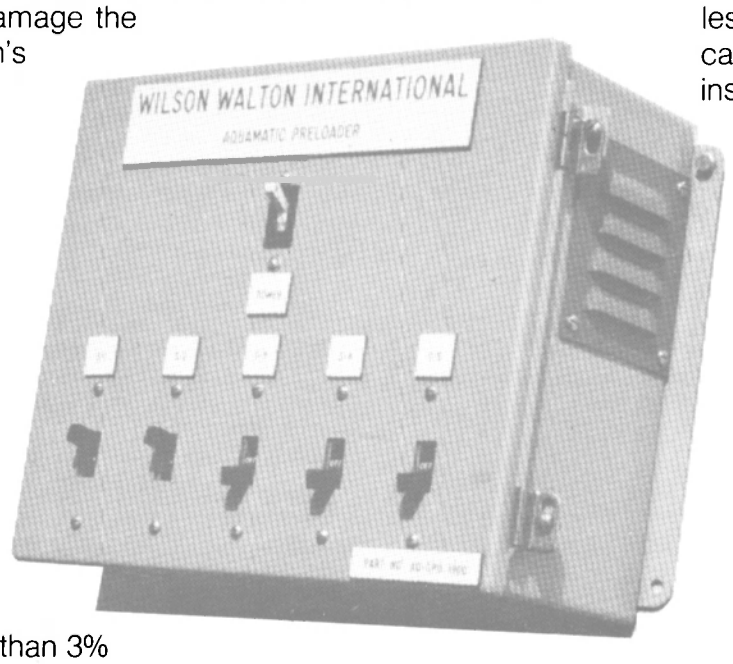
Dr. **Gibson-Smith's** most recent assignment was a chief geologist (worldwide) for British Petroleum. Immediately prior to his appointment as president of BPAE, he was a Sloan Fellow at the Stanford Graduate School of Business.

He joined BP in 1970 as a geologist. His experience includes exploration assignments in the North Sea, South America, the Canadian East Coast and Arctic Regions, and a three-year assignment in the U.S. Gulf Coast. As president of BPAE, he succeeds **John R. Grundon,** who has returned to the British Petroleum head office in London.

PROLONG HULL COATING LIFE AVOID OVER PROTECTION WITH THE AQUAMATIC PRE-LOADER

Your Impressed Current Cathodic Protection System (ICCP) is designed to protect the underwater steel hull from corrosion. However, it can damage the hull coating if the system's operating voltage is too high. This condition is defined as overprotection and will lead to premature coating loss.

A vessel whose hull coating has been recently applied or is in good condition will need only a small amount of ICCP current for proper corrosion protection. This is exactly when the problem is likely to occur. Most ICCP Systems cannot produce less than 3% of their rated capacity (leakage current). This leakage current can be in excess of that which is needed and often causes overprotection.



The **AQUAMATIC PRE-LOADER** has been designed to solve exactly this type of problem. It can be installed on any type of ICCP system, regardless of the Manufacturer or the rated capacity of the system. It can be installed by the ship's crew in about 1 to 2 hours. Once installed, the crew would adjust the PRE-LOADER by switching on the amount of pre-load required. Total time for adjustment-5 minutes.

Once the calibration is set, its operation becomes fully automatic. As the hull coating deteriorates and more cathodic protection current is required, the **AQUAMATIC PRE-LOADER** will automatically switch itself off enabling the ICCP system to operate normally.

SPECIAL FEATURES

- Will work on any ICCP system regardless of manufacturer or system capacity
- Easily installed and calibrated by the ship's crew (1-2 hours)
- Is something that every ship owner should consider when utilizing an ICCP system in conjunction with a superior hull coating
- Priced at $2,485 (including all installation hardware).

ADDITIONAL BENEFITS

- Re-directs excess cathodic protection current back into the power supply
- Automatically shuts off when a pre-load is no longer necessary (as hull coating deteriorates)
- Lowers operating voltage at the anodes
- Guaranteed to work
- Prolongs hull coating life

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Sulzer ZA40 Diesels Will Power Two Ferries Ordered In U.K. And Japan

North Sea Ferries, a joint operation between P&O of the United Kingdom and Nedlloyd of the Netherlands, has chosen Wartsila/Sulzer ZA40 medium-speed diesel engines for the two new cruise ferries contracted for in the U.K. and Japan. A total of eight engines will be supplied, with four the U.K.-built vessel manufactured by Clark Kincaid Ltd.

Each ferry will have two nine-cylinder and two six-cylinder ZA40 main engines with a combined output of 21,600 bhp at 580 rpm. These engines will be installed in a "father/son" arrangement driving two propellers, giving wide flexibility in engine operation to suit sailing schedules. Service speed of the ferries will be 18.5 knots.

Intended for North Sea Ferries' Hull-Rotterdam service, these 31,000-grt ferries will be built by Govan Shipbuilders in the U.K. and Nippon Kokan in Japan, with both scheduled to enter service in the spring of 1987.

Among the largest ferries in the world, one is notable for being the largest passenger ship to be built in the U.K. for almost 20 years. With an overall length of 587.26 feet, beam of 80.38 feet, and draft of about 20 feet, each ferry will have a capacity for 1,258 passengers. Three vehicle decks will accommodate either 180 trailers, 580 cars, or some combination of both. Provision will be made for a variety of special cargoes, including heavy lift unit loads of up to 180 tons.

For free literature on Wartsila/Sulzer ZA40 diesels,

Circle 71 on Reader Service Card

Stevens Named Vice President Of Manitowoc

Frank Stevens

Ralph Helm, president of The Manitowoc Company, Inc. of Manitowoc, Wisc., has announced the appointment of **Frank Stevens** as vice president of the corporation. In addition to his previous responsibilities as general counsel and acting secretary, Mr. **Stevens** will now be responsible for the firm's departments of Personnel & Industrial Relations, Wage & Salary Administration, and Insurance & Office Administration. He is also secretary and treasurer of Manitex Inc., the firm's new subsidiary recently incorporated in Texas.

Mr. **Stevens** joined The Manitowoc Company, which is the parent firm of Bay Shipbuilding Corporation of Sturgeon Bay, Wisc., as general counsel in 1983. From 1970 to 1983 he was group counsel with worldwide legal responsibilities for the Construction and Mining Equipment Group of American Standard, Inc.

Cummins-Powered Construction Pushboat Delivered By Keith A. Record

The 42-foot, 50-ton pushboat Walter D. Johnson, newly built by Keith A. Record of Portland, Ore., is undertaking a demanding job on the Columbia River—that of spotting bridge construction barges in tight quarters and rapid river currents.

For this tough assignment, vessel owner Johnson Bros. Corporation selected twin Cummins KT19-M marine diesel engines for main propulsion. At an intermittent power rating of 2,100 rpm, each of these six-cylinder turbocharged engines develops 510 bhp.

Most pushboats of this size do not have nearly this much horsepower, but reliable propulsion, with plenty of power in reserve, was needed for this bridge construction job. The Minnesota-based Johnson Bros. has a $16-million contract to build a three-lane, 3,365-foot-long bridge across the Columbia River at Umatilla, Ore.

The new towboat will be used in a variety of bridge-building functions, including the construction of cofferdams, maneuvering crane barges, and transporting cement trucks on a service barge for construction of the bridge piers.

The Walter D. Johnson has a beam of 18 feet and depth of 7 feet; operating draft is 6 feet. Operator eye level in the pilot house is 25 feet above the waterline.

Each Cummins KT19-M engine turns a 46-inch-diameter stainless steel propeller supplied by HDF Propellers of Seattle. Air controls are American Standard, and the hydraulic steering system, making use of Parker cylinders, valves, and pumps, was supplied by Western Fluid Power of Portland.

The pushboat has a Fernstrum keel cooling system for the main engines that is mounted on the sides of the hull due to the vessel's short hull length for the engine horsepower installed. Fuel filters are by Racos and mufflers by Harco.

A 20-kw Northern Lights generator was supplied by Alaska Diesel Electric of Seattle. Rodgers Marine Electronics of Portland supplied the Raytheon radar, Standard depth sounder, Standard VHF radio, and Horizon hailer. Other suppliers, all in Portland, included Apollo Marine Services, electrical components; Western Metals, aluminum windows; and In-Mar Sales, Devoe points.

Tenneco Oil And Sohio Will Use Canmar Rig For Arctic Drilling

Tenneco Oil Exploration and Production and Sohio Alaska Petroleum Company have signed a two-year contract with the Canmar/Reading & Bates joint venture for the use of Canmar's single steel drilling caisson (SSDC) mobile Arctic drilling unit.

Tenneco and 11 partners will use the unit for a wildcat well on Block 284 in the Harrison Bay area of the Alaskan Beaufort Sea. Drilling is planned to begin in November 1986; Sohio will use the unit the following winter.

The mobile drilling vessel will sit atop a specially constructed steel mat base on the sea floor. In previous operations, the vessel sat upon a man-made gravel base on the ocean floor.

The SSDC/mat system is a cost-effective alternative to using a land rig on a specially built gravel island, Tenneco said. The pyramid-shaped mat is designed to safely withstand the forces of moving ice, a major consideration in Arctic offshore operations.

The Tenneco-operated wildcat, termed the Phoenix prospect, will be drilled in 61 feet of water approximately 50 miles northwest of the Prudhoe Bay field. Tenneco acquired drilling rights to Block 284 and five other blocks in Federal Lease Sale 71 in October 1982.

Bill Paredes Elected Sales & Marketing VP Of Forney Engineering

C. Bill Paredes has been elected vice president of sales and marketing of Forney Engineering Company, a wholly owned subsidiary of Foster Wheeler Corporation.

Mr. **Paredes** joined Forney in 1964 and after 10 years in research and development was elected vice president of the company's Industrial Systems Division. He was next appointed president of subsidiary Forney International, Inc., and most recently, vice president of product development. Earlier, he had been director of engineering and research at Bergen Research, Inc., Teterboro, N.J.

Todd-Seattle Awarded $15-Million Navy Contract For Destroyer Overhaul

Todd Pacific Shipyards Corporation, Seattle Division, has been awarded a $14,963,827 fixed-price-incentive Navy contract for the regular overhaul of the destroyer USS Harry W. Hill (DD-986). Work is expected to be completed by May 9, 1986. Contract funds would have expired at the end of the current fiscal year. Seven bids were solicited and four offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-8522).

Shipboard Liquid-Level Sensor Offered By Tecnomatic Controls

A sturdy liquid-level sensor and transmitter from Tecnomatic Controls Ltd. in Britain is said to withstand the rigors of shipboard and rig applications. Constructed of stainless steel and monel (a nickel-base alloy), the Series 200 is completely seawater, oil and chemical resistant, and its transducer is fully submersible. Adjustments to "zero" and "range" are made remotely, without removing the sensor from its location.

The instrument continuously measures the level of liquid in a tank or reservoir and provides an electrical output. Mounting adaptability makes it usable on shipboard oil and ballast tanks and for a wide range of industrial applications.

The sensor employs the well proven technology of a pressure-sensitive capsule and a linear variable differential transformer. Mechanically coupled, they translate the pressure on the capsule into an electrical output which, in turn, is amplified and transmitted in the form of a 4-20 mA full-scale signal.

The signal may be used for indication, alarm and control functions. Power supply is 18-30 V DC and operating temperature is –10° C to +85° C.

For further literature containing full information,

Circle 63 on Reader Service Card

Maritime Association Installs New Officers And Directors

The Maritime Association of the Port of New York/New Jersey recently installed its newly elected officers and directors. **Hans K. Schaefer**, president of Todd Shipyards Corporation, has been elected the new vice president, replacing **John H. Griffith**, chairman of Norton, Lilly International, Inc. **Bruce A. McAllister** remains as president of the association, and **Paul Preus**, president of Clean Water, Inc., as treasurer.

New directors installed for three-year terms were: **Gilbert H. Dunham**, senior vice president, Johnson & Higgins; **James A. Johnson**, president, Steamco Corporation; **Brian A. McAllister**, president, McAllister Brothers, Inc,; **Robert E. Negron**, president, Electro-Nav, Inc,; **John L. Sullivan Jr.**, president, Smit International (Americas) Inc.; **Kenneth H. Warner**, president, Northeast Marine Pilots/ Sound Pilots.

Founded in 1873 as The Maritime Association of the Port of New York, the name was changed recently to include New Jersey, to more accurately reflect the bi-state nature of the port and the geographic range of its members. From its headquarters in lower Manhattan, the Association operates a 24-hour Marine Intelligence Center to monitor ship arrivals and departures.

The Maritime Association represents its members at all levels of government, and various committees work to maintain safe and efficient movement of vessels and cargo in port. Another important role is the sponsorship of conferences and exhibitions that focus worldwide attention on the port and member activities. The Association is also a driving force for industry involvement in the Statue of Liberty/Ellis Island restoration project, as well as Operation Sail 1986.

Newly installed directors of the Maritime Association of the Port of New York/New Jersey pose with president **Bruce A. McAllister** (center). They are (L to R): **James A. Johnson**, president Steamco Corporation; **John L. Sullivan Jr.**, president, Smit International (Americas) Inc.; Mr. **McAllister**; **Robert E. Negron**, president, Electro-Nav, Inc.; and **Gilbert J. Dunham**, senior vice president and director, Johnson & Higgins. Directors not pictured include **Brian A. McAllister**, president, McAllister Brothers, Inc.; and **Kenneth H. Warner**, president, Northeast Marine Pilots.

New Company Formed To Coordinate Activities Of Lister and Petters

Hawker Siddeley has announced the formation of a new company to manage and coordinate the activities of its companies that manufacture small diesel engines—R.A. Lister and Company Limited of Dursley, Gloucestershire, and Petters Limited of Staines, Middlesex.

The new company, Lister-Petter Limited, will have the following board: **D.C.S. Esse,** chairman; **S.J. Keyworth,** managing director; **D.A. Besse,** finance director; **T.D. Davies,** director; **W.T. Grant,** sales director; **J.S. Maitland,** director and secretary; **J.L. Stevens,** technical director; and **A.R. Taylor,** production director.

Circle 47 on Reader Service Card

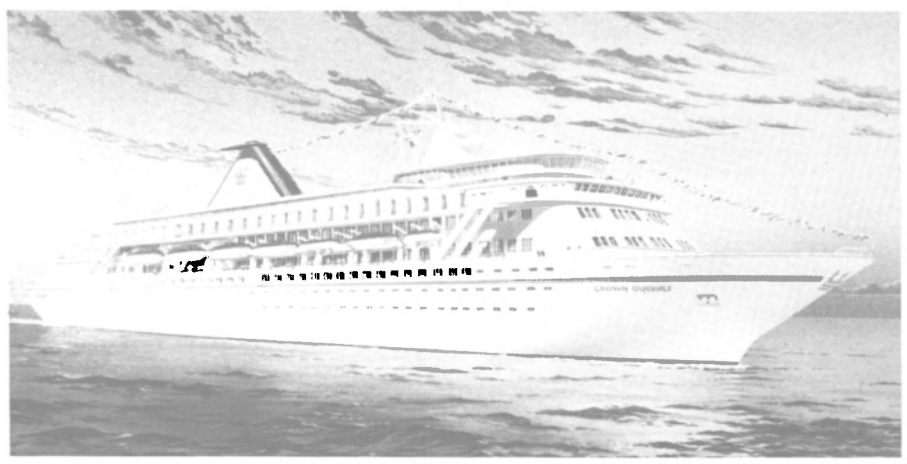
PIMA Appointed U.S. And Canadian Representative For Colombo Dockyard

Louis W. Gomlick, president of Penn International Marine Agencies, Ltd. (PIMA), recently announced that PIMA has been appointed the exclusive representative in the U.S. and Canada for Colombo Dockyard (Pte) Ltd. of Sri Lanka.

Colombo Dockyard is a major ship repair facility located in the Indian Ocean between South Africa and Singapore.

The yard presently has three graving docks capable of handling vessels up to 30,000 dwt. Machine shops and other facilities have up-to-date equipment with qualified supervision and labor to perform any type of repair and conversion work in the marine field. A 100,000-dwt graving dock, now under construction, is scheduled to be completed by the end of 1985.

Circle 20 on Reader Service Card



Royal Cruise Line To Build Two Luxury Liners At Cost Of More Than $200 Million

Royal Cruise Line (RCL) of Piraeus, Greece, has announced its commitment to build two 990-passenger luxury cruise ships to join its present fleet of ships, the Golden Odyssey and the Royal Odyssey. Under the personal supervision of RCL chairman **P.S. Panagopoulos**, the new ships will be built by Meyer Werft in Papenburg, West Germany. RCL has retained the Danish ship design firm of Knud E. Hansen as consultants.

Construction of the first 40,000-grt, 495-cabin ship, to be named the Crown Odyssey, will begin immediately, with delivery scheduled for the first quarter of 1988. The second vessel, to be constructed concurrently, is tentatively scheduled for delivery by Christmas 1988.

This expansion represents an investment in excess of $200 million, and by increasing the line's capacitv to a total of 3,300 berths, it will place RCL among the five largest cruise lines in the world. Mr. **Panagopoulos** said it is the very strong and steady demand for RCL's deluxe standard of worldwide cruising over the past decade that has provided the basis for his decision.

Among the innovative features planned for the new luxury liners is a unique outside glass elevator to transport passengers to a lounge on the top deck with a 360-degree view. Other features include an increased number of spacious suites, private lounges for groups, expanded fitness and health facilities, and two outdoor pools.

In addition to the passenger amenities, plans include sophisticated satellite navigation and communications, state-of-the-art electronics, advanced equipment to increase fuel efficiency, and innovative hull lines. Other considerations concern efficient passenger and baggage handling on embarkation and disembarkation, as well as designs for the most efficient provisioning in port.

Goldstein Named Chairman Of COMSAT—Joseph Promoted To President

COMSAT has announced that its board of directors has elected **Irving Goldstein** as chairman and chief executive officer, and **Marcel Joseph** as president and chief operating officer of the corporation, effective October 1 this year.

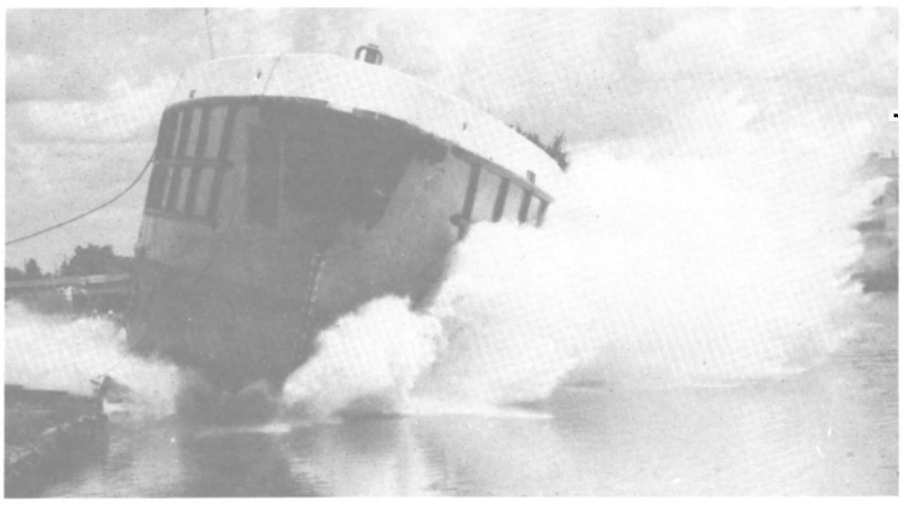
Mr. **Goldstein,** who joined the company in 1966 and has been president of COMSAT since 1983, will succeed Dr. **Joseph Charyk,** who will retire at the end of September. He will continue to serve on the board of directors of the corporation.

Before becoming president of COMSAT in 1983. Mr. **Goldstein** had been executive vice president since 1982. Earlier, he held top management positions with the corporation's broadcast satellite and INTELSAT businesses.

Before joining COMSAT in April of 1985 as executive vice president, Mr. **Joseph** served for 24 years in progressively responsible management positions with General Electric Corporation, most recently as vice president and general manager of GE's Transportation Products Division.

Boeing Awarded $6.9-Million Navy Contract For Hydrofoil Support Work

Boeing Marine Systems of Seattle has been awarded a $6,872,734 cost-plus-fixed-fee Navy contract for engineering and technical support services for the Advanced Hydrofoil Program and the Hydrofoil Special Trails Unit. Work will be performed in Bremerton, Wash., and is expected to be completed by June 30, 1987. Contract funds would not have expired at the end of the current fiscal year. Eighteen bids were solicited and one offer was received. The David W. Taylor Naval Ship Research and Development Center, Bethesda, Md., is the contracting activity (N00167-85-C-0017).



Innovative Triple-Screw Tugboat Launched By Halter Marine

Jack Edwards, president of Halter Marine, Inc., has announced the recent launching (photo) at its Lockport, La., yard of a highly innovative 140-foot tugboat, first of two under construction for Otto Candies, Inc. of Des Allemands, La. This $5-million vessel, which is described by **Otto Candies Jr.** as a go-anywhere, do-anything tug, combines conventional and azimute drive technology in one boat.

The triple-screw tug, with outboard Niigata Z-Peller drive units and conventional center line propeller, all in nozzles, will provide Candies with both domestic and international towing capabilities.

Without its house top, the vessel at launching weighed 500 tons. According to Mr. **Edwards,** a comparable conventional tug would weigh some 150 tons less at this stage. The difference is Ice Class "C" construction and a beefed-up stern, which contribute to both stability and versatility.

This design allows for routine engine maintenance even when carrying payloads by shutting down either outboard engine while running on the center line diesel. In any condition, the vessel can continue under way with excellent maneuvering capability.

With the outboard Z-Pellers in nozzles, the joy stick control may be moved forward, aft, port, or starboard and the vessel will respond almost instantly in any direction. This system will allow the vessel to handle tremendous loads in the tightest of spots, eliminating the usual need for multiple tugs in many offshore applications.

The Candies vessel has a beam of 42 feet, depth of 20 feet, and loaded draft of 19 feet. She is powered by three GM Electro-Motive Division 16-645 E6 diesels with a total rating of 5,850 bhp at 900 rpm. The centerline engine has a Reintjes WAV-2250 reduction rear.

The towing winch is a Markey TDSDS-36 driven by a GM Detroit Diesel 8V-92 engine. The hydraulic windlass was supplied by Markey. The fire monitor system includes a 2,000-gpm pump and two monitors—a 1,000-gpm unit with local control and a remote-controlled 1,000-gpm unit. Fuel capacity is approximately 85,000 gallons and fresh water 35,000 gallons. The vessel has accommodations for 14 people.

Krupp MaK Consolidates In North America —Literature Available

Krupp Mak Diesel, Inc. (KMDI), a subsidiary of Krupp Mak Maschinenbau GmbH, which has been selling medium-speed engines for heavy fuel and MDO operation both in the United States and in Canada, will relocate its offices and parts warehouses to Toronto, Canada, on October 15, 1985. KMDI (Chicago) will be maintained as a registered company with its commercial address in Toronto.

Krupp Mak Canada Inc., which previously had staff and facilities in several locations, will be combined in the new Toronto premises at 226 Britannia Road, Mississauga, Ontario.

The consolidation will facilitate communication with customers and ensure higher availability of specialists at any time.

Sales and service representatives currently employed in the United States will remain at their respective locations.

For further information on Krupp MaK Diesel or the consolidation,

Circle 53 on Reader Service Card

Newport News Awarded $29-Million Navy Contract For Sub Design Work

Newport News Shipbuilding and Dry Dock Company in Newport News, Va., has been awarded a $28,931,175 cost-plus-fixed-fee Navy contract for attack class submarine design. Work is expected to be completed in October 1986. Contract funds would not have expired at the end of the current fiscal year. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-2128).

Walker Named Manager Of Marketing Communications At Harris

The Harris RF Communications Group, Rochester, N.Y., recently announced the promotion of **John R. Walker** as manager, marketing communications for the Long-Range Radio Division.

In this position, Mr. **Walker** will be responsible for advertising, product promotions and trade shows for the Long-Range Radio Division in support of government and commercial/marine marketing.

Harris Corporation is a $2-billion producer of state-of-the-art information processing, communication and microelectronic products for the worldwide information technology market. The company employs 30,000 people and operates 35 plants in the U.S. and abroad.

RCCL Awards Contract To French Yard For 70,000-grt Cruise Ship

Royal Caribbean Cruise Line A/S has signed a contract with Chantiers de l'Atlantique of Saint Nazaire, France, for the construction of a luxury passenger ship of about 70,000 grt.

According to RCCL president **Edwin Stephan,** the french shipyard was selected after a long and intensive selection process that began with 14 yards being invited to submit proposals, and three on the short list for final analysis.

The new ship, scheduled for delivery in early 1988, will be 874-feet long with a beam of 106 feet, and will have about 1,100 passenger cabins.

Truman Joins INDEECO As Advertising Manager

Industrial Engineering & Equipment Company (INDEECO), St. Louis, Mo., recently announced that **Katina R. Truman** has joined its operation as advertising manager.

From the St. Louis office, **Mrs. Truman** will implement advertising programs to support INDEECO's extensive electric heating line.

Mrs. Truman held senior sales and marketing positions with National Can Corporation, National Marine Service and the Bunce Corporation of St. Louis. She will maintain the in-house advertising agency and develop INDEECO's promotional program which will include direct mail, display advertising, catalog production and market research.

INDEECO is a leading manufacturer of electric heating equipment and Solitech electronic controls for the industrial, space and marine heating markets in the U.S. and abroad.

For further information on INDEECO and their products,

Circle 42 on Reader Service Card

Alabama Dry Dock Gets $9.4-Million Navy Contract To Overhaul Ammo Ship

Alabama Dry Dock and Shipbuilding in Mobile has been awarded a $9,419,642 firm-fixed-price Navy contract for the regular overhaul and drydocking of the ammunition ship USS Butte (AE-27). Work is expected to be completed in April 1986. Contract funds would not have expired at the end of the current fiscal year. Sixteen bids were solicited and eight offers were received. The Supervisor of Shipbuilding, Conversion and Repair, San Francisco, is the contracting activity (N00024-85-H-8103).

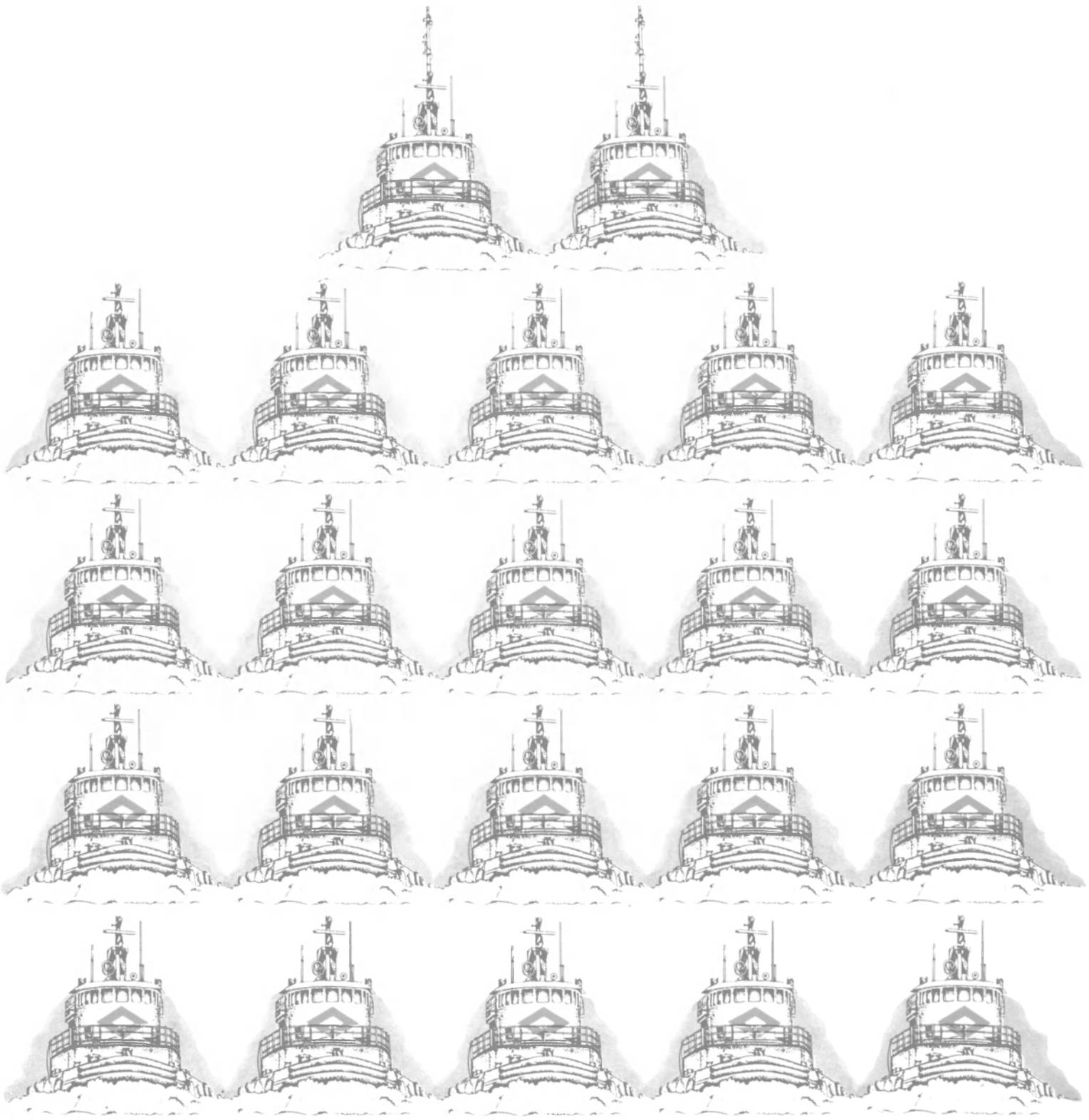
Kanalley Named Manager Of Technical Services For Alco Power

Cathy Kanalley

Cathy S. Kanalley has been promoted to the position of manager-technical services at Alco Power Inc. of Auburn, N.Y. The announcement was made by **Gary E. Huneycutt**, Alco's director of marketing and sales.

In her new position, Mrs. **Kanalley** will be responsible for corporate technical literature requirements as related to the Renewal Parts Department. In her 14 years with the company she has held positions in international sales and technical publications.

Alco is a subsidiary of Bombardier Inc., a diversified Canadian manufacturer of transportation, industrial, and recreational products.



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SHIPBUILDING, BOATBUILDING, DRILL RIG BUILDING & REPAIR COMPANIES:

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ARITIME EXPOSITION IN DECADES"

This will be the fourth year the prestigious society of Naval Architects and Marine Engineers is sponsoring a marine trade show in conjunction with their internationally renowned annual meeting and technical symposium in New York City.

Previous S.N.A.M.E. Expositions have been resounding successes. All exhibit space was completely booked at an extremely early date and attendance exceeded all expectations. This fourth annual combination technical symposium and exposition is also booked to capacity with far more exhibits than last year and attendance is certain to exceed that of 1984.

The November double issue of MARITIME REPORTER will contain details of the full technical program as well as all activities associated with the exhibition during this most important annual event.

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Maritime Reporter carried more pages of advertising than the No. 2 magazine.

SHIPLIFTING AND DRYDOCKING SYSTEMS

Better Equipment Increases Profitability

—A Review—

Most U.S. shipyards are in the process of increasing their efforts to expand repair and conversion work, both commercial and military. As many of these projects include drydocking, the efficiency of a shipyard's shiplift/transfer systems plays a vital role in the profitability of any contract.

The editors of MR/EN asked the leading designers, manufacturers, and users of these systems to tell us about their latest developments and experiences. The following review is based on replies that we had received at press time.

FOR MORE INFORMATION

If you wish to receive additional information on any of the products or installations described in this review, circle the appropriate reader service number(s) listed under each company's name, using the postage-paid card bound into the back of this issue.

AMIRIKIAN ENGINEERING

Circle 80 on Reader Service Card

Amirikian Engineering Company of Chevy Chase, Md., recently announced the development of a revolutionary drydock that features a new concept of stabilization for floating craft. Called "Stabilized Buoyancy Lift Dock and Shore Transfer System," the new floating dock, consisting of a compartmented pontoon and complemented with a stabilizer, can lift a ship out of water and raise it to the needed level for direct roll-on shore transfer.

The drydock, installed in a berth adjacent to a pier, bulkhead, or a corner of a slip, is operated by compressed air—without the aid of winches, cables, or chains, and needs no second flanking pier. Thus, the dock being free of obstructions of such adjuncts, drydocking access of a ship can be made from the side or an end; after elevated lift, the shore transfer is likewise accomplished sideways or endwise. Furthermore, no limitations are imposed on the dock's lifting capacity. It can raise and shore-deliver any floating craft—whether it be a small fishing vessel, an ocean liner, a supertanker, and even a giant aircraft carrier. The entire operation can be carried out through a programmed remote control.

The stabilizer consists of a specially devised structural framing that is fitted between the inboard face of the dock and the flanking pier or bulkhead. It serves the same stabilizing function as do the sidewalls in a conventional floating drydock; that is, to restore equilibrium after a disturbance due to an external force. However, in a floating drydock, restoration of equilibrium is obtained through jerky motions of pitch, roll, and yaw, while in the lift dock the stabilizer resists such rotational motions to occur, and at the same time provides guidance for free vertical movements under both tidal rise and fall, as well as in operational ascent and descent, thus keeping the deck of the dock in a horizontal plant at all stages of operation.

The stabilizer was conceived by Dr. **Arsham Amirikian,** president of Amirikian Engineering, who formerly served in the U.S. Naval Facilities Engineering Command as chief designing engineer and chief engineering consultant. Upon retirement in 1971, he established the firm to render private consulting services, specializing in drydocking facilities.

BARDEX HYDRANAUTICS

Circle 81 on Reader Service Card

Founded in 1963 as an engineering-oriented organization having the capability to develop and manufacture sophisticated hydro-mechanical systems, Bardex Hydranautics is headquartered in Goleta, Calif., with offices in Houston, London, and Singapore. The company designs and manufactures heavy-load moving equipment for offshore and shipyard-related activities, including systems for applications ranging in size to more than 50,000 tons.

Bardex systems are specified by the major designers, drillers, oil companies, and shipyards around the world. These systems meet the exacting standards of all certifying and classifying agencies, including the American Petroleum Institute, the U.S. Coast Guard., American Bureau of Shipping, Lloyd's Register of Shipping, and Bureau Veritas.

Bardex has supplied rig-skidding systems for 95 percent of the major offshore platforms in the world, and is said to be the only major shiplift manufacturer whose equipment has a flawless safety record. The company is also a supplier of main deck structure lifting systems for offshore drilling rigs, and pioneered highly flexible, low-cost hydraulic shipyard systems for transferring ships from the water to berths on shore.

Bardex Hydranautics products are to be found virtually wherever there is a requirement to move a heavy load, such as ship and drill rig building and repair, offshore oil and gas drilling and production, and heavy construction.

Where heavy loads, such as ships, must be lifted with precision and safety, a Bardex chain jack lifting system is employed. The key element in this lifting system is the hydraulic chain jack, which consists of a vertical jack that lifts its load by pulling one or more chains upward through two sets of locking pins in precise steps of one chain pitch. As in other Bardex Hydranautics systems, the number, size, and design of the assemblies vary with customer load requirements.

Chain jacks may be used individually, but are normally employed in sets of two or more, and can be controlled by one operator from a single control station. Other system components include the hydraulic power unit, chain, load equalizer-compensator assembly, and the interconnecting high-pressure hydraulic hoses.

The key element in a Bardex skidding system is the jacking assembly that the company calls a gripper jack. It consists of a double-acting hydraulic jacking cylinder (the jack) mounted to a patented hydraulic locking device (the gripper), which clamps the flange of the beam on which the load is resting and acts as a movable reaction point for the jack.

For rapid turnaround in high-use areas of a shipyard, BH provides wheeled transfer systems (bogie trains). Lifting and lowering of the ship to and from support blocking are performed with a self-contained hydraulic system on the bogie train. With this system the side transfer pit is eliminated, allowing free movement of vehicles and foot traffic.

The gripper jacks are normally used on skid beams, but transfer systems using roller beams are also available. These require less jacking force than skid beam systems, minimizing initial equipment costs.

Where moving heavy loads over relatively unprepared surfaces is required, a BH Translift "walking" system may be used. The basic Translift system consists of a center load support, connected outer load supports, and an onboard control console. If desired, remote control of all units in the system can be achieved by using a portable pendant console. Translift systems can rotate in a full 360-degree circle, and can "walk" a load using the simple principle of weight transferrence between the center load supports and the connected outer load supports.

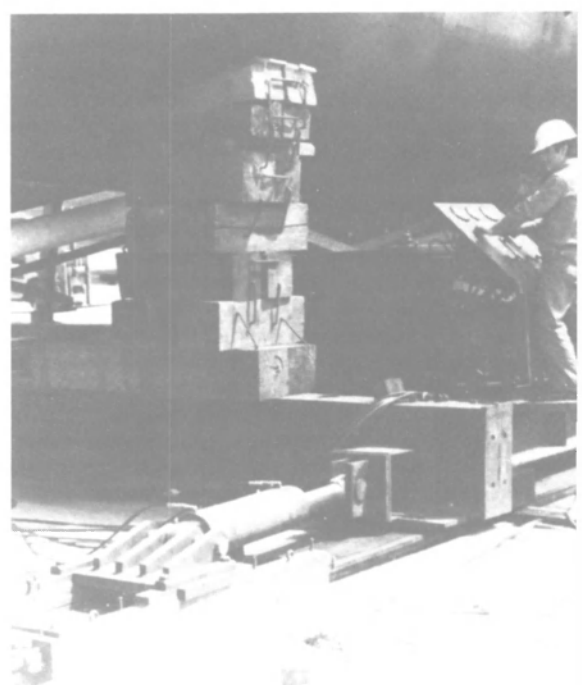
Some recent installations of BH equipment in the shipbuilding and repair industry include the following:

Hyundai Heavy Industries in Ulsan, South Korea is equipped with a shiplift system and a horizontal transfer system. The shiplift platform is approximately 400 by 66 feet and has a capacity of 4,100 metric tons.

The new $200-million shipbuilding and repair complex of PNOC Marine Corporation at Batangas Bay, Philippines, is equipped with a hydraulic shiplift system and hydraulic wheeled transfer system. The platform of the elevator measures 566 by 100 feet, said to be the largest hydraulic-actuated elevator in the world.

The floating drydock used at Daewoo's Okpo yard in Korea is equipped with a Bardex roller beam transfer system capable of moving ships or sections weighing up to 6,000 metric tons. The same hydraulic system is also used on fixed or portable beams located in the yard to move offshore structures and jackups as well as ships and sections.

Bardex Hydranautics hydraulic gripper jack.



BIW-PORTLAND

Circle 82 on Reader Service Card

Bath Iron Works opened its Portland, Maine, overhaul and repair facility in late 1983. Since then, four U.S. Navy ships have been accommodated in the huge floating drydock, the largest of its type on the East Coast.

With a certified lifting capacity of 81,000 tons, this drydock could accommodate 80 percent of the ships now operating throughout the world. The dock measures 844 feet in length, 256 in width, and has a clear docking width between wingwalls of 142 feet. Crane service is provided by two 25-ton wingwall units.

As originally designed during World War II, the drydock utilized independent machinery spaces within the hull of each of the nine dock sections. Each of these spaces contained the pumps, diesel generators, electrical switchgear, and controls required to operate that dock section.

The BIW overhaul of the electrical systems included three major objectives: the power distribution system needed to be converted to operate on commercial mains in lieu of the 18 installed generators; facilities had to be added to provide for the greatly increased shore power requirements of modern ships; and a centralized control and monitoring system was necessary to eliminate the need for nine machinery space operating crews.

Commercial power was brought aboard at 12,740 volts using two independent feeders. These supply a new 480-volt distribution switchboard via two new 2,500-kva transformers. Independent shore power for ships within the dock is distributed from the dock feeders via 2,000-kva transformers and a second new 480/450-volt switchboard. A 560-kw emergency generator was added to permit limited operation in the event commercial power is lost.

A new centralized control station was provided by construction of a control house above the inboard wingwall. The centralized control and monitoring features added include monitoring of tank levels, control of the ballast pumps, monitoring and limited control of the power distribution and lighting systems, and control of the tank, pump, and flooding valves.

Approximately 900 existing machinery control circuits are interfaced with the control system and multiplexed for transmission back to the central control station by a remote electronics panel installed in each of the machinery spaces. Automatic control and alarm features are provided by a central computer within the control console.

BETHLEHEM STEEL

Circle 83 on Reader Service Card

Bethlehem Steel Corporation's floating drydock at the new Sabine Yard in Port Arthur, Texas, consists of eight identical sections. They each measure 240-feet long, 101-feet wide, and 23½-feet deep. The eight sections, when fastened together, have a lifting capacity of 64,000 tons, making it one of the largest drydocks in the country.

Each drydock section is a 4,200-ton, all-welded steel structure consisting of a ship-shaped hull (pontoon) that supports two rectangular box-shaped wing (side) walls. The midship portion of the pontoon contains a non-floodable compartment, or buoyancy chamber. The greater part of the mechanical and electrical equipment required for operation of the dock section is located in the various compartments of this chamber.

During normal operation of the dock, access to the buoyancy chamber is gained from the wing walls through two watertight passageways extending through the pontoon, one passageway to each wing wall. The passageways continue upward through the wing walls in the form of circular stairways and terminate at the safety decks.

The remainder of the pontoon is subdivided by two longitudinal and two transverse bulkheads into eight ballast compartments, four on each side of the buoyancy chamber. Each ballast compartment can be flooded or pumped out through a lateral pipe that is connected to the flood-

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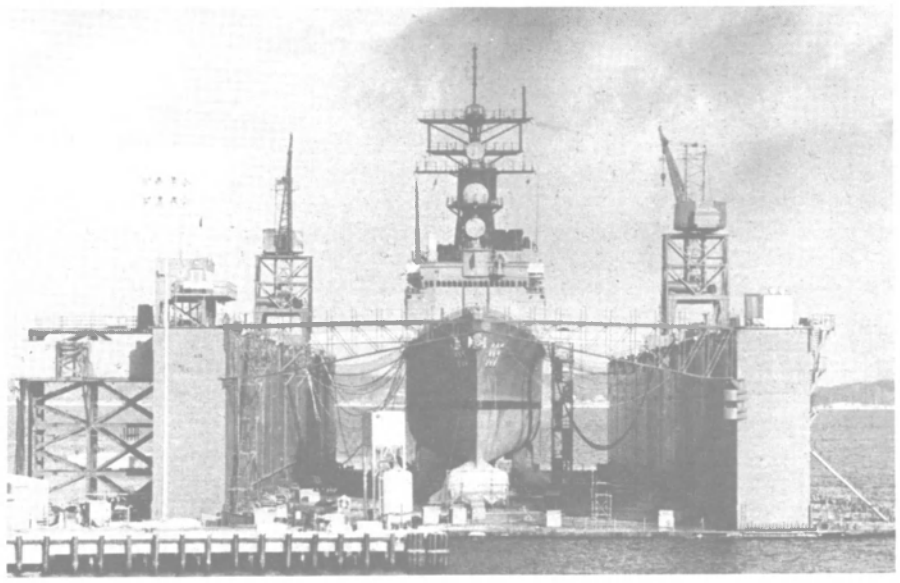

Bath Iron Works-Portland drydock

Shiplift/Drydock

(continued)

ing and pumping system of the pontoon.

The wing walls, which house more than 28,000 square feet of potential office and shop space, are 48-feet high, 18-feet wide, and 101-feet long. The distance between wing walls is 122 feet.

In the assembled dock—with three-foot spaces between sections—the wing walls of the individual pontoons are connected with welded plates. This creates two continuous box girders extending the full-length of the dock, while it also provides longitudinal moment strength.

To be devoted primarily to the repair and inspection of mobile offshore drilling units and production facilities, the drydock contains electrical generating equipment, utility capacity, and cranes, and is equipped with machine, carpenter, and electrical shops.

The sectional dock can be configured to provide a clear docking area of either 413 by 362 feet or 829 by 122 feet, depending on the size and shape of the incoming vessel. This unique flexibility will accommodate jackup rigs, semisubmersibles, submersibles, and drillships.

The U.S. Navy surplus drydock, built during World War II, was transported earlier this year from Pearl Harbor to Bethlehem's Beaumont Yard, where it was refurbished and modified.

CRANDALL DRY DOCK

Circle 84 on Reader Service Card

Crandall Dry Dock Engineers,

Crandall-designed 1200 ton railway dry dock.

Inc. of Dedham, Mass., has been involved for more than 50 years in design and construction of ship transfer systems, from railway drydock cradles and floating drydocks ranging from a few hundred tons to up to 50,000 tons. Most have used low-friction rollers on flat rail plates to minimize propulsion requirements, but some, like Ingalls Shipbuilding in Pascagoula, Miss., use the self-propelled Western Gear cars and pallets on heat-treated crane rails.

The floating drydock is the only dock capable of lifting very heavy ships up to yard elevation for transfer to several berths without need for cross-transfer due to the dock's own mobility. In general, Crandall has found the economics of vessel transfer to depend on the duration of storage on the berth. For new construction, as at Ingalls and Avondale, the transfer is vital so that the dock itself can remain unoccupied for short-duration ship repairs. Selectivity is very important when one drydock is to service many land berths. However, if the many berths are basically for winter storage where sequence of springtime launching is unimportant, then a more compact land utilization is more logical, as exists at Marine Industries in Sorel, Quebec.

A recently built 1,200-ton railway drydock at Zeebrugge, Belgium, with two 1,000-ton side transfer berths, has proven very effective and economical, with no land space wasted for a cross transfer. The very shore duration of vessel repairs, ranging from eight hours to about three days, is done mainly on the cradle of the drydock. Side transfer is used in Berth No. 1 for seven- to 30-day work, and in Berth No. 2 for all projects of over two or three weeks, including new construction or major conversions. The slipway and its transfer service the Zeebrugge fishing fleet of about 155 trawlers in a wet basin that permits 24-hour operation, with more than two hauls per day if necessary.

For stability reasons, smaller vessels that have an inclined keel as they float without cargo, must be docked on an inclined dock. Use of a curved track for the railway makes it possible for the cradle deck to be inclined to maintain vessel stability when grounding and yet be horizontal in the up position; the mobility of a floating drydock achieves the same result.

Two recently constructed transfer systems were built to serve two older marine railways where the vessel keel line remains on a declivity. The demand by a few yards to increase their repair capacity by use of transfer berths rather than new drydocks has been solved by using a series of horizontal side transfer ways arranged in a stepped fashion to suit the original incline of the railway cradle.

Modern practice in shipyard development starts with the main drydocking system designed such that in future years if business so demands transfer can later be added without disrupting the original dock. This is the case for shiplifts, railways, or floating drydocks.

Finally, it is interesting to note that even though the best situation for transfer from floating docks is where the tide range is small, Crandall has developed solutions even where water level changes range from 6 feet to 17 feet. Vessel transfer to and from drydocks is a concept not to be overlooked in new or even in existing shipyards.

MA.N.-GHH

Circle 91 on Reader Service Card

GHH is one of the oldest builders of drydocks, having started in 1876, and since 1956 it has built 88 docks at its facilities in Blexen, Germany, on the southern bank of the Weser River across from Bremerhaven. Forty-eight of these were delivered after Germany's shipyards were allowed to resume work in 1953, six of which were sold to the USA.

This year alone, M.A.N. delivered the 22,000-ton dock Mission Bay to Continental Maritime of San Francisco, and is soon to launch a 28,000-ton dock for the Middle East.

Noteworthy about the dock Mission Bay is that it complies with the damage stability requirements in accordance with Mil Std 1625; the

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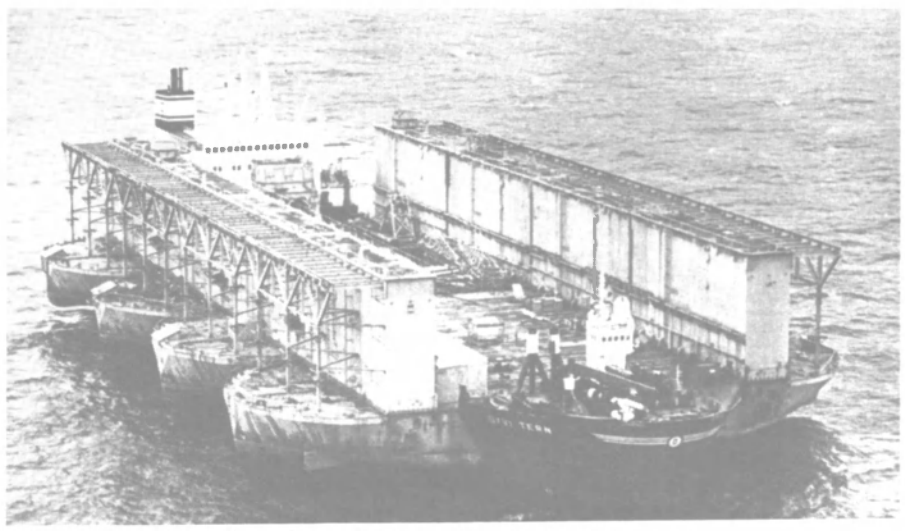

Four of drydock sections for Bethlehem Steel's new Sabine yard.

Shiplift/Drydock

(continued)

dock has been designed to accommodate both modern U.S. combat ships such as the DDG51, and also commercial vessels of the Panamax size; and it features M.A.N.'s unique remote controlled bilge block system that allows easy adaptation to the various different hull forms of modern Navy ships. (See MARITIME REPORTER issue of Mav 15, 1985, page 8.)

M.A.N.-GHH's facilities have immediate access to the open sea, and feature large fabrication shops to preassemble dock modules, as well as a slipway of over 1,200 feet in width to accommodate the construction and launching in one piece of docks of any kind or size. At the time of launching, docks are completely outfitted and ready for towage to final destination.

Besides customer-tailored design and building of docks by in-house specialists, M.A.N.-GHH offers additional services, such as consultation for anchorage and offsite preparation, towing to site at fixed prices, commissioning, personnel training for dock operation, and assistance in securing long-term financing.

The management of the Dockbuilding Division, including engineering and sales, is located at M.A.N.-GHH headquarters in Oberhausen-Sterkrade, Germany.

M.A.N.-GHH is represented in the U.S. by American M.A.N. Corporation in New York, with branch offices in Houston, San Francisco, and Seattle.

MARINE TRAVELIFT

Circle 92 on Reader Service Card

Located in Sturgeon Bay, Wisc., Marine Travel, Inc. is one of the world leaders in the design and manufacture of mobile boat hoists.

The latest addition to the company's complete line of hoists is the 100 BFM, called a "little" giant that can handle commercial fishing vessels, workboats, and pleasure craft. This wide versatility can result in more customers and improved shipyard utilization.

Outstanding design features of the 100 BFM include: "beam forward" design for more rigging and foredeck structure clearance; all slings power-adjustable; high-strength, low-alloy main frame construction; fast, two-speed hoisting and travel; low, enclosed operator's cab; full instrumentation; orbital steering with automatic realignment; stainless steel hydraulic tubing; accurate load weight indicator; radial tubeless tires; mechanical anti-two-block system; fully enclosed, easy-access engine and hydraulic compartment; and better boat handling with forward sling adjustment aft of the front beam.

NORSHIPCO

Circle 85 on Reader Service Card

Norfolk Shipbuilding and Drydock Corporation in Virginia has announced the arrival of the newest component in its ship repair facilities—a self-contained steel floating drydock that has been named Virginian. Built in the Netherlands, it has a lifting capacity of 20,000 long tons, an overall length of 669 feet, overall width of 126 feet, and width between wingwalls of 103 feet at the operating deck level.

The first half of the dock arrived at the shipyard in June this year and the second half during the first week of August, both towed across the Atlantic on oceangoing semisubmersible barges. The dock was scheduled to become operational by the end of August.

The new arrival will join the 950-foot-long, 160-foot-wide Norshipco Titan drydock, which has a lifting capacity of 54,250 long tons and gives the Norfolk shipyard one of the most significant privately owned drydock lifting capacities on the East Coast.

The Virginian will be divided by five watertight bulkheads into six compartments, each 98.4 feet long. Two watertight longitudinal bulkheads, each 23 feet from the center line, and one on the center line, will divide the dock into a total of 24 tanks. The most forward and most aft center tanks are both 118 feet long. Normal pumping time is approximately 140 minutes.

Half of Norshipco's new Virginian drydock.

PEARLSON ENGINEERING

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Pearlson Engineering Company, Inc. of Miami, Fla., designs Syncrolifts to meet the specific requirements of shipyard owners. Using state-of-the-art computer-aided design and drafting systems, Pearlson prepares detailed design drawings for the shiplift platform and transfer system components that enable the client to fabricate these items locally. The specialized lifting equipment and control system are furnished by Pearlson, along with the services of a commissioning engineer to assist in the commissioning and testing of the Syncrolift system.

Syncrolift systems offer pushbutton ease of operation, drydocking in a minimum amount of space, drydocking on an even keel at yard elevation with no obstructions to impede work area, continuous synchronization of all lifting points, and easy access to all components for lower maintenance costs.

In October this year Pearlson will begin erection of the world's largest-capacity Syncrolift at Vickers Shipbuilding and Engineering Ltd. in Barrow-in-Furness, U.K. The Vickers shiplift will incorporate a platform 161.8 by 21.7 meters and have a lifting capacity of 24,000 metric tons. This installation is part of the Submarine Facilities Project and will include the world's largest single-lever transfer system. Groups of self-powered transfer cars will be used to position individual hull sections during assembly as well as move the completed conventional and nuclear submarines from the construction hall to the Syncrolift platform for launching.

The Vickers installation will feature wire rope using a proprietary "brifil" material from British Ropes. In this process the spaces between individual wires are filled with a "plastic" material while the rope is formed. This results in what is commonly known as a "valley-filled" wire rope. Ropes manufactured in this way require only a small amount of surface lubrication and effectively eliminate the problem of internal corrosion. It is anticipated that these brifil ropes will have a useful life in excess of 10 years. Lloyd's Register of Shipping has approved testing of the wire rope assemblies at the site using

Inc. of Dedham, Mass., has been involved for more than 50 years in design and construction of ship transfer systems, from railway drydock cradles and floating drydocks ranging from a few hundred tons to up to 50,000 tons. Most have used low-friction rollers on flat rail plates to minimize propulsion requirements, but some, like Ingalls Shipbuilding in Pascagoula, Miss., use the self-propelled Western Gear cars and pallets on heat-treated crane rails.

The floating drydock is the only dock capable of lifting very heavy ships up to yard elevation for transfer to several berths without need for cross-transfer due to the dock's own mobility. In general, Crandall has found the economics of vessel transfer to depend on the duration of storage on the berth. For new construction, as at Ingalls and Avondale, the transfer is vital so that the dock itself can remain unoccupied for short-duration ship repairs. Selectivity is very important when one drydock is to service many land berths. However, if the many berths are basically for winter storage where sequence of springtime launching is unimportant, then a more compact land utilization is more logical, as exists at Marine Industries in Sorel, Quebec.

A recently built 1,200-ton railway drydock at Zeebrugge, Belgium, with two 1,000-ton side transfer berths, has proven very effective and economical, with no land space wasted for a cross transfer. The very shore duration of vessel repairs, ranging from eight hours to about three days, is done mainly on the cradle of the drydock. Side transfer is used in Berth No. 1 for seven- to 30-day work, and in Berth No. 2 for all projects of over two or three weeks, including new construction or major conversions. The slipway and its transfer service the Zeebrugge fishing fleet of about 155 trawlers in a wet basin that permits 24-hour operation, with more than two hauls per day if necessary.

For stability reasons, smaller vessels that have an inclined keel as they float without cargo, must be docked on an inclined dock. Use of a curved track for the railway makes it possible for the cradle deck to be inclined to maintain vessel stability when grounding and yet be horizontal in the up position; the mobility of a floating drydock achieves the same result.

Two recently constructed transfer systems were built to serve two older marine railways where the vessel keel line remains on a declivity. The demand by a few yards to increase their repair capacity by use of transfer berths rather than new drydocks has been solved by using a series of horizontal side transfer ways arranged in a stepped fashion to suit the original incline of the railway cradle.

Modern practice in shipyard development starts with the main drydocking system designed such that in future years if business so demands transfer can later be added without disrupting the original dock. This is the case for shiplifts, railways, or floating drydocks.

Finally, it is interesting to note that even though the best situation for transfer from floating docks is where the tide range is small, Crandall has developed solutions even where water level changes range from 6 feet to 17 feet. Vessel transfer to and from drydocks is a concept not to be overlooked in new or even in existing shipyards.

MA.N.-GHH

Circle 91 on Reader Service Card

GHH is one of the oldest builders of drydocks, having started in 1876, and since 1956 it has built 88 docks at its facilities in Blexen, Germany, on the southern bank of the Weser River across from Bremerhaven. Forty-eight of these were delivered after Germany's shipyards were allowed to resume work in 1953, six of which were sold to the USA.

This year alone, M.A.N. delivered the 22,000-ton dock Mission Bay to Continental Maritime of San Francisco, and is soon to launch a 28,000-ton dock for the Middle East.

Noteworthy about the dock Mission Bay is that it complies with the damage stability requirements in accordance with Mil Std 1625; the

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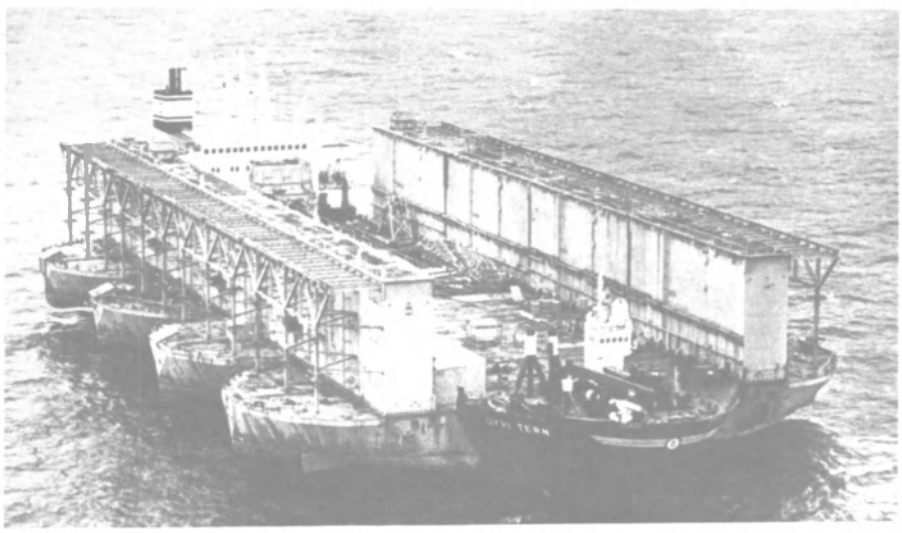

Four of drydock sections for Bethlehem Steel's new Sabine yard.

Shiplift/Drydock

(continued)

dock has been designed to accommodate both modern U.S. combat ships such as the DDG51, and also commercial vessels of the Panamax size; and it features M.A.N.'s unique remote controlled bilge block system that allows easy adaptation to the various different hull forms of modern Navy ships. (See MARITIME REPORTER issue of May 15, 1985, page 8.)

M.A.N.-GHH's facilities have immediate access to the open sea, and feature large fabrication shops to preassemble dock modules, as well as a slipway of over 1,200 feet in width to accommodate the construction and launching in one piece of docks of any kind or size. At the time of launching, docks are completely outfitted and ready for towage to final destination.

Besides customer-tailored design and building of docks by in-house specialists, M.A.N.-GHH offers additional services, such as consultation for anchorage and offsite preparation, towing to site at fixed prices, commissioning, personnel training for dock operation, and assistance in securing long-term financing.

The management of the Dockbuilding Division, including engineering and sales, is located at M.A.N.-GHH headquarters in Oberhausen-Sterkrade, Germany.

M.A.N.-GHH is represented in the U.S. by American M.A.N. Corporation in New York, with branch offices in Houston, San Francisco, and Seattle.

MARINE TRAVELIFT

Circle 92 on Reader Service Card

Located in Sturgeon Bay, Wisc., Marine Travel, Inc. is one of the world leaders in the design and manufacture of mobile boat hoists.

The latest addition to the company's complete line of hoists is the 100 BFM, called a "little" giant that can handle commercial fishing vessels, workboats, and pleasure craft. This wide versatility can result in more customers and improved shipyard utilization.

Outstanding design features of the 100 BFM include: "beam forward" design for more rigging and foredeck structure clearance; all slings power-adjustable; high-strength, low-alloy main frame construction; fast, two-speed hoisting and travel; low, enclosed operator's cab; full instrumentation; orbital steering with automatic realignment; stainless steel hydraulic tubing; accurate load weight indicator; radial tubeless tires; mechanical anti-two-block system; fully enclosed, easy-access engine and hydraulic compartment; and better boat handling with forward sling adjustment aft of the front beam.

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non-destructive testing equipment. It is no longer necessary to break-test wire rope to prove its condition.

During the first half of 1985, three Syncrolift projects were commissioned. An eight-hoist (137-ton capacity each) shiplift in Howth, Ireland, for the Office of Public Works is now operational. This facility is part of the Department of Fisheries plan to develop Howth as a major fishery harbor. The platform measures 36.5 by 12.2 meters and has a maximum lifting capacity of 875 metric tons.

At the port of Iskerderun in Turkey, the Syncrolift is part of the new Vessel Maintenance Facilities operated by Turkish State Railways. This installation incorporates eight 244-ton hoists, has a platform 40-meters long and 22-meters wide, and has a maximum lifting capacity of 1,440-metric tons.

In Japan, the second Syncrolift caisson lift has been completed for Penta Ocean Construction Company at Yunotsu. This lift incorporates eighteen 376-ton-capacity hoists, has a platform 30.1-meters long by 21-meters wide, and has a maximum design capacity of 200 tons per meter.

Recent orders include a Syncrolift of the Oman Navy. Hochtief Aktiengesellschaft of Essen, West Germany, has contracted for an 8,580-metric-ton maximum-lifting-capacity shiplift on behalf of the Sultanate of Oman. This facility will have a platform 106-meters long by 18.5-meters wide, and utilize forty 244-metric-ton capacity hoists.

Syncrolift continues to maintain its overwhelming market position with its proven design and easy-to-maintain, reliable components. Since the original invention in 1954 by **Raymond Pearlson,** Syncrolift has revolutionized the way modern shipyards are planned.

SENERMAR

Circle 87 on Reader Service Card

Senermar S.A. of Madrid and Bilabo, Spain, naval architects and shipyard designers, recently received a contract to design a new floating drydock that will be owned by the Peruvian Navy and operated by the Peruvian shipbuilder and repairer, Sima Peru. This dock, with a lifting capacity of 4,500 tons and capable of handling vessels of up to approximately 9,000 dwt, will be built at Sima Peru's Callao shipyard.

Sima Peru, which has three yards—at Callao, Iquitos, and Chimbote—employs about 1,000 workers on newbuilding and 2,100 on repairs, and can construct ships of up to 65,000 dwt including tankers, multi-purpose vessels, and warships. The company can repair vessels of up to 65,000 dwt including tankers, multi-purpose vessels, and warships. The company can repair vessels of up to 26,000 dwt at the Callao yard.

The Senermar contract involves design, technical assistance, the supply of all major material, and financing. The design of the Sima drydock will be developed by Senermar using its FORAN internationally accepted CAD/CAM system, which will produce architectural calculations, classification drawings, and construction design. During construction of the drydock at Callao, all technical assistance will be provided by Senermar, including the provision of on-site engineers.

Supply of materials will be handled by INDUNARES—the Spanish Association of Shipbuilding Auxiliary Industry—and will cover cranes, pumps, compressors, generating sets, steel, pipe, valves, etc.

This "total package" approach was also taken with the floating dock constructed recently at ASMAR of Chile's Talcahuano yard, which is owned and operated by Socibar, a joint venture of ASMAR and E.N. Bazan of Spain. Capable of handling vessels of up to 30,000 dwt, this dock was also designed by Senermar, including technical assistance for material specifications.

Having applied this "total package" approach to the construction of two floating drydocks, it seems likely that Senermar will use it again on future contracts.

SOUTHWEST MARINE

Circle 88 on Reader Service Card

The San Diego shipyard of Southwest Marine, Inc. (SWI) last year accepted delivery of the 22,000-ton-capacity drydock Pride of San Die-

(continued on page 22)

(continued)

go, ordered in late 1982 as part of the yard's modernization plan. The computer-operated, self-maneuvering land transfer drydock is a major unit in SMI's $35-million renovation of the San Diego yard. The modernized facilities exceed all U.S. Navy requirements, and allow the yard to effectively service all types of naval and commercial vessels.

Built by Kawasaki Heavy Industries in Japan, the Pride of San Diego dock has many innovative features. It is capable of transferring 10,000-ton ships (cruiser/destroyer types) from dock to shoreside platforms using a new transfer method. Another feature is its ability to transfer ships with its computerized control system, regardless of tide changes.

The Pride of San Diego is equipped with remote-controlled, articulated dock arms that, in most cases, will reduce the need for staging that is normally required. The dock is cathodically protected against corrosion, environmentally safe, and completely energy self-sufficient.

Part of SWI's modernization at San Diego is a new 700- by 60-foot pier that can serve ships with drafts of up to 35 feet. A new 65-ton gantry crane was installed to service ships at the pier and in the drydock.

Pearlson Syncrolift and Transfer System at Todd Pacific San Pedro yard.

TODD-SAN PEDRO

Circle 89 on Reader Service Card

A $47-million Syncrolift shiplift and transfer system, currently the largest and most technologically advanced facility of its kind in the world, was dedicated last year at the San Pedro, Calif., yard of Todd Pacific Shipyards Corporation's Los Angeles Division.

The Syncrolift is a product of Pearlson Engineering Company of Miami, the world leader in shiplift technology and the only firm in the world devoted exclusively to the design and manufacture of shiplift systems.

The San Pedro installation is designed specifically for construction and repair of naval surface combatants, but it is also suitable for commercial vessels. The system increased the Los Angeles Division's new construction capacity by 100 percent and its repair capability by 250 percent.

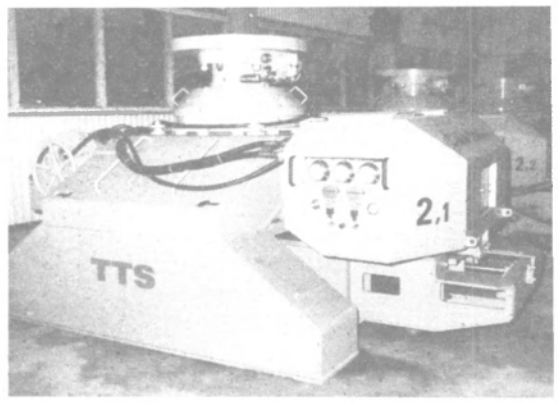
The Syncrolift permits the San Pedro yard to perform multiple drydockings with one lifting platform that hoists a ship from the water to land level, where it is towed onto a side transfer carriage and moved to any of five work areas. The platform, which can be used as a sixth work station during peak periods, is powered by one hundred and ten 15-hp electric motors. Lifting speed is approximately nine inches per minute; the designed maximum lifting time is 72 minutes.

The platform, which measures 655 by 106 feet, can handle ships with overall length of 780 feet and beam of 105 feet. Maximum lifting capacity, when docking directly on the platform without a cradle, is 22,000 long tons. Maximum draft over the cradle is 32 feet.

The new shiplift system will enable the Los Angeles Division to achieve productivity gains resulting from: multiple access to vessels undergoing overhaul and repair; better material handling and flow, including prepositioning; accelerated preoutfitting of modular units for new hulls under construction; use of the shiplift as a launching platform in lieu of, or supplementing, new construction in progress on the inclined ways; lessening of environmental constraints by working ships on land instead of at a wet berth; and mechanical/electrical utility conservation, including recycling of used blasting grit.

The design of the strategically placed mechanical manifolds, multiservice electrical stations, and crane services at the work bays provide full service to single- or double-ship berths. The demands for each bay were developed using peak loads and other requirements as stipulated for fully crewed Navy ships.

Every anticipated requirement of the ship repair and modular assembly options, including at the land-level berths, was given full consideration. Comparable services were designed for installation at the lifting platform to satisfy production requirements at that location.



TTS DWB walking beam units.

TTS

Circle 90 on Reader Service Card

Total Transportation Systems, Inc. (TTS) of Newport News, Va., recently delivered a dual "walking beam" transporter system to Marinette Marine Corporation in Marinette, Wisc. Said to be the first of its kind in the U.S., this system consists of eight 200-ton walking beam units, and has been designed to be expanded to handle 3,200 tons by attaching additional walking units.

The dual walking beam is an extremely compact hydraulic transporter system that has been used not only to move large ship sections, or even a complete ship, but will also fit or regulate the sections during the actual construction of the vessel. The system can operate on most rough-graded surfaces without any foundations or walkways. The precise movements of the hydraulics combined with the design of the walking unit make the dual walking beam a highly effective shipyard tool.

Kenmark Industries of Santa Barbara, Calif., a wholly owned subsidiary of TTS, recently designed and delivered a 200-ton, twin-lift hoist system to Marinette Marine, unique in that it has winches located on only one side of the vessel. This feature maximizes the flexibility of the shiplift by offering improved access to the vessel. It also allows easier transfer of the vessel on and off the shiplift platform from either the free side or from the end.

This configuration is of special interest to the shipyard owner who wishes to make the most of the valuable land surrounding the shiplift for construction or repair activities. In addition to the improved arrangement, the twin-lift hoist system design reduces both the initial capital and the maintenance cost of the shiplift.

Kenmark has just received a contract from Hyundai Heavy Industries in South Korea for a jacket loadout and launch system. With a capacity of 20,000 tons, this system will consist of two hydraulic power units and a number of jacking units of the gripper design. HHI intends to use the jacking system for the loadout of the San Miguel jacket now under construction at its Ulsan yard. This system can easily be expanded to handle larger jackets in the future.

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Circle 140 on Reader Service Card

EXPOSHIP Riomar 85

Rio de Janeiro, Brazil
October 14-19, 1985

Expoship Riomar, the only international maritime exhibition in Latin America and one of four fairs organized by Seatrade, will be held this year on October 14-19 in Rio de Janeiro, Brazil. With the 1985 event moving back to its original venue at the Museum of Modern Art, in the heart of Rio's business center and only a short distance from the city's international and domestic airports, a high attendance is anticipated.

Expoship Riomar is sponsored by the Government of the State of Rio de Janeiro, Secretariat of Industry, Commerce and Tourism, and is organized by Fieras e Conferencias Internacionais Ltda., a member company of the Seatrade Group. Co-sponsors are the National Superintendency of Merchant Marine, the Import and Export Agency of the Bank of Brasil, and ESABRAS—Associated Shipyards of Brasil/The Brazilian Oceangoing Shipowners Association. Over the years, Expoship Riomar and its associated conference have attracted exhibitors, visitors, and delegates from every area of the international maritime industry.

The scope of technological advances and the long list of products manufactured by Brazilian shipbuilding industries are displayed to a worldwide market, increasing Brazil's international reputation and placing this exhibition as a significant event in naval engineering and shipbuilding.

The associated Seatrade Riomar Conference will be held October 15-16 in the auditorium of the Brazilian Naval War College in Rio. At the opening of the conference, an introductory address will be made by Dr. **Affonso Camargo,** Minister of Transport of Brazil.

Chairman for the first day of the conference will be Ambassador **Manoel Pio Correa Jr.,** president of ESABRAS—Associated Shipyards of Brazil, and president of Ishikawajima do Brasil Estaleiros S/A—Ishibras. Speakers will include **Peter Landsberg,** president of Verolme Estaleiros Reunidos do Brasil S/A; and **Eliezer Batista da Silva,** president, Companhia Vale do Rio Doce.

The second day of the conference on October 16 will be chaired by **Hugo Sommerkamp Bernales,** president of Alamar, and president, Consorcio Naviero Peruano S/A.

Conference Agenda
Tuesday, October 15

Session One will be devoted to Commodity Exports. Massive new developments such as the Carajas iron ore project and the Cerrados scheme for opening up vast areas of virgin land to agriculture will transform the pattern of raw material exports from Brazil. This session will discuss these and other major shifts in South American commodities trading, and also look at their importance in terms of ports and sea transport.

The topic for Session Two will be Finance and Shipbuilding. Against the background of current economic realities and the worldwide surplus of capacity, what are the prospects for the ship construction industries of Ibero-America? What level of domestic demand can be anticipated and what prospects exist for exporting ships? What is the attitude of governments towards an industry that remains a major industrial employer?

Wednesday, October 16

Session One will discuss Trade in Manufactured Goods. The important traffic in manufactured goods ranging from automobiles to shoes, and the viewpoint of the major shippers in the Latin American liner trades will be reflected in this session. The implications of recent political developments such as the U.S. Shipping Act of 1984 for the South American liner trades will also be discussed.

Session Two will deal with Ibero-American Ports. The need to upgrade port facilities continuously in line with the demands of trade in South and Central America will be discussed, with emphasis on cargo-handling and infrastructural development.

For further information on Expoship Riomar 85 Exhibition and Conference, contact Seatrade Conferences & Exhibitions Ltd., 11/12 Bury Street, London EC3A 5AT, U.K.: telephone 01 623 7150, telex 896640 VPLO G.

EXPOSHIP RIOMAR 85 —V INTERNATIONAL MARITIME EXHIBITION

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Banco do Estado do Rio de Janeiro S/A—Banerj
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Esabras Estaleiros Associados do Brasil
Empresa Brasileira de Reparos Navais S/A—Renave
ECIC S/A Controles Elétricos
Fronape—Frota Nacional de Petroleiros
Fermasa Maquinas e Equipamentos S/A
Governo do Estado do Rio de Janeiro
GPG Serviços Mecanicos Navais Ltda.
Global Transporte Oceanico S/A
Geipot—Empresa Brasileira de Planejamentos de Transportes
Germanischer Lloyd do Brasil Ltda.
Hempel Tintas Marítimas Ltda.
Helistone Industria e Comercio de Helices S/A
Industrias Reunidas Caneco S/A
Ishikawajima do Brasil Estaleiros S/A—Ishibras
Intec Injeçao Tecnica Ltda.
Integral Transporte e Agencimento Marítimo Ltda.
Kauri Sigma S/A Tintas e Resinas
Kopperschmidt-Mueller Industrial Ltda.
Kamyr do Brasil Tecnica de Celulose Ltda.
Mecanica Pesada S/A
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Niver lines
Oriental Commercial and Shipping Company Ltd.
Petroleo Brasileiro S/A—Petrobras
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Port of Houston Authority
Siemens S/A
Schottel do Brasil Propulsões Marítimas Ltda.
Semco do Brasil S/A
Sunamam—Superintendencia Nacional da Marinha Mercante
Sperry S/A
Secretaria de Transportes Aquaviarios do Ministerio dos Transportes
Sabroe Atlas do Brasil Ltda.
Transroll Navegação S/A
Tintas International S/A
Vale do Rio Doce Navegaçao S/A—Docenave
Valvulas Schrader do Brasil S/A
Varig S/A
Verolme Estaleiros Reunidos do Brasil S/A
Vulkan do Brasil Industria e Comercio de Acoplamentos Ltda.

Newport News Awarded $4-Million Navy Contract For Engineering Services

Newport News Shipbuilding and Dry Dock Company, Newport News, Va., has been awarded a $3,990,924 cost-plus-fixed-fee Navy contract for engineering services related to attack class submarines. Work is expected to be completed by September 30, 1985. Contract funds would not have expired at the end of the current fiscal year. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-2056).

International Conference On The Global Ocean Set In Woods Hole

A conference titled "The Global Ocean—Its Chemistry and Resources," will be presented in Woods Hole, Mass., on September 23-27, by the International Union of Pure and Applied Chemistry through its CHEMRAWN program (an acronym for Chemical Resources Applied to World Needs). Cosponsors are the American Chemical Society, Scientific Committee on Oceanic Research, and Year of the Ocean.

Chairman of the program is Dr. **J. Robert Moore** of the University of Texas at Austin. Approximately 200 scientists from around the world are expected to attend.

For general information regarding registration fees, accommodations, program, etc., write CHEMRAWN IV Coordinating Office, Oceanography Program, The University of Michigan, 2455 Hayward Avenue, Ann Arbor, Mich. 48109-2143, or contact **Nancy Enright** (202) 872-4450, or **Lee Borah** (202) 872-4443.

Midland Ross Offers Free, 20-Page Brochure On Max-Gard® System

Midland-Ross Corporation, Russellstoll Division, Livingston, N.J., is offering a free, full-color, 20-page brochure on the Max-Gard® plug, receptacle, connector and interlock system from Russellstoll.

According to the publication, the Max-Gard system, which features a variety of unique safety attractions into one plug, receptacle and interlock system, was developed by Russelstoll in response to changing industry needs. The special features of the system are listed in the brochure as follows: gated dead-front construction prevents insertion of foreign objects; copper-free cast aluminum housings for strength and corrosion resistance; smaller diameter center earth (ground) pin in every device makes first and breaks last (the system is always grounded and can never be inadvertently plugged in phase to ground); single-rated factory polarization will not permit insertion of devices polarized to a different amperage, voltage, frequency or phase; acme threads prevent "freezing" of parts; optional provision for two additional control contacts provides electrical interlock capability or a control or metering circuit; up to four-wire five pole contact configurations satisfy virtually any electrical requirement; available in weathertight (flap cover) and watertight (screw cover) protection; 300 series stainless steel hardware; deep insulating chambers; standard "O" rings around contacts and interior to provide environmental separation and watertight security; plugs and connectors are available with adapters for rigid conduit or armored cable, and nonmetallic cable or flexible conduit; and in the near future, crimp terminals will be available.

The 20-page brochure uses a bevy of color photographs and charts to illustrate and instruct on the Max-Gard system. The publication gives a series of uses for the versatile system in such businesses as: shipyards, hospitals, railroads and cosmetics.

For a free copy of this full-color brochure from Midland-Ross,

Circle 59 on Reader Service Card

In addition, Midland-Ross if offering a 188-page catalog on Russellstoll Marine Electrical Equipment. For a copy,

Circle 60 on Reader Service Card

Wilson Walton Receives Two Contracts For Emergency Service

Wilson Walton International of Stockton-on-Tees, Cleveland (UK), recently received two contracts to provide rapid emergency service to two ship operators.

The first contract, for a Norwegian customer, involved the replacement of a scrubber base tank, part of the ship's inert gas system, which has suffered damage through over heating.

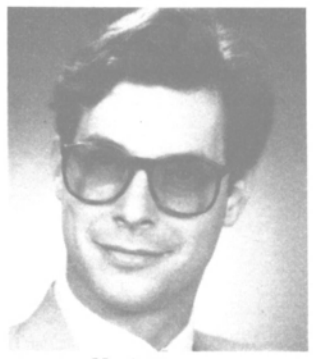
Since the ship's inert gas system had been designed, built and installed by Wilson Walton, the company built a replacement base tank and rubber-lined it in just three weeks.

The second contract, for a U.S. customer, was to design, fabricate and ship two pressure vacuum breakers for two vessels in port in Italy. The contract also required the supply of complete installation drawings. The total contract took only 10 days to finish the one-ton units. Each pressure vacuum breaker had a 12,000 m^3hr. capacity and was approximately 7½-feet high and 4.3 feet in diameter.

For further information on Wilson Walton International and their products,

Circle 40 on Reader Service Card

Herzog Promoted To VP/General Manager Of Hiller's New Office



Mark Herzog

L.D. Greenwood, president of Hiller Systems, Mobile, Ala., recently announced the appointment of **Mark E. Herzog** as vice president/general manager of the company's new East Coast office. Mr. **Herzog** has spent the last eight years working for major fire protection equipment manufacturers, and most recently was employed by Walter Kidde.

For over 60 years the Hiller group of companies have been leaders in marine fire protection and safety systems, employing system design, fabrication, installation, and commissioning. Hiller also has an excellent reputation in the marine decking and flooring industry, both in the commercial and military sectors.

Sale Of Imperial Survival Suits Approaches 100,000 —Literature Available

Sales of cold-water survival suits by Imperial Manufacturing Company of Bremerton, Wash., approach 100,000 this year, according to production manager **Jim Skelly**. A big boost in sales for the company, which has been producing survival suits for 15 years, came last summer when new U.S. Coast Guard requirements became effective. Interest of the marine community in improving protection against drowning and hypothermia—death from loss of body heat—continues to increase both in the U.S. and abroad.

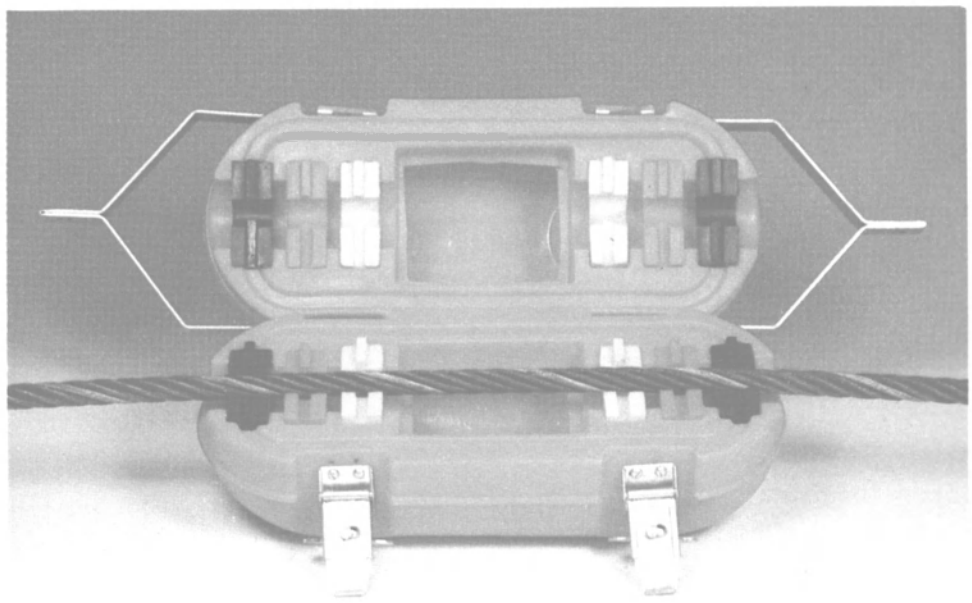
In a four-month period last summer, Imperial sold 8,500 survival suits, nearly its total sales volume in some years. According to Mr. **Skelly,** Imperial supplies 75 percent of the U.S. market for survival suits, with the remaining production split among a handful of companies.

Imperial has worked with various governing bodies, including the Coast Guard and Underwriters Laboratory, in testing and developing safe standards, and is said to be the only U.S. manufacturer of survival suits to pass the Norwegian Maritime Directorate standards, the most stringent in the world. More than 300 individuals have reported incidents where their lives were saved through the use of Imperial survival suits.

For details and free literature on these suits,

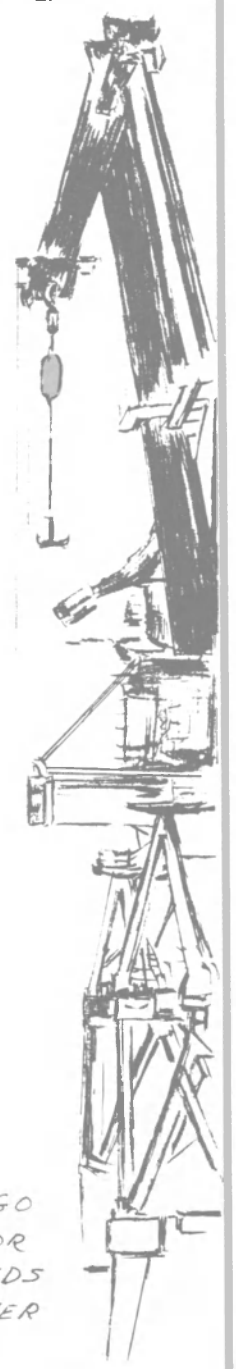
Circle 68 on Reader Service Card

CABLE $AVER

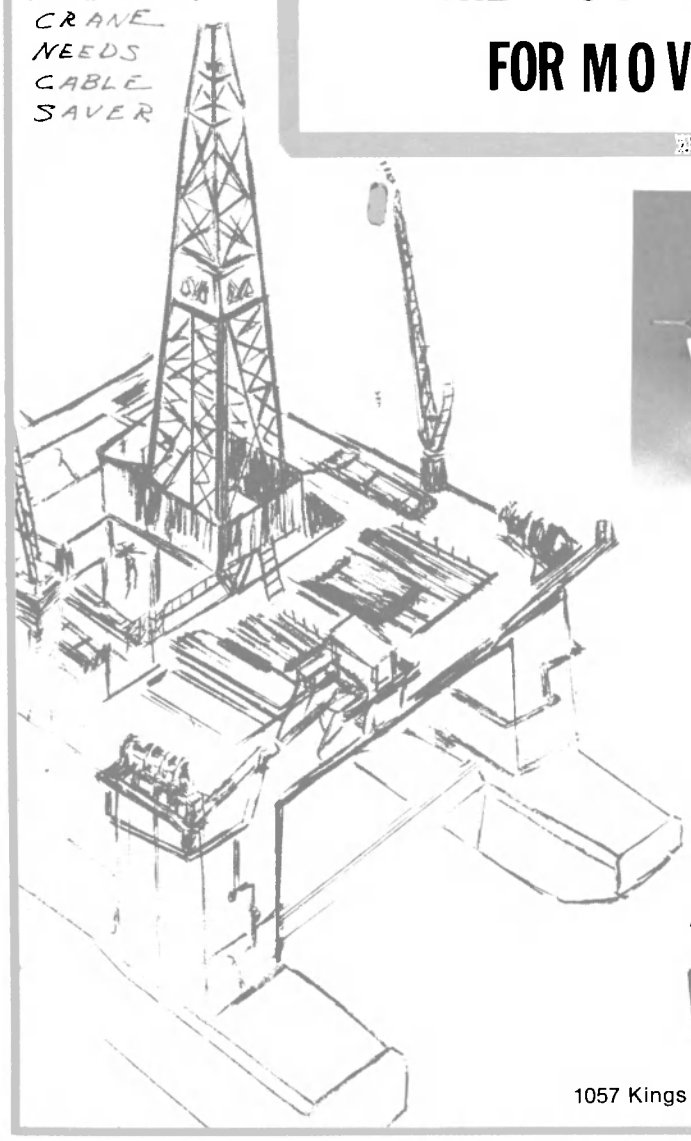


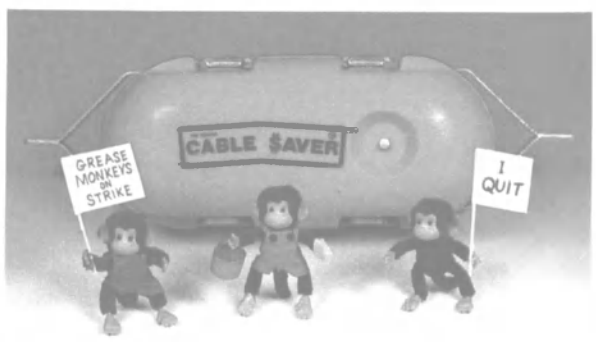
MODEL # 3
12 HALF SEALS 75 – 25 DUROMETER

THE AUTOMATIC LUBRICATOR FOR MOVING STEEL CABLE



EVERY DRILL RIG MAIN PLUS AUXILLARY CRANE NEEDS CABLE SAVER





EACH CARGO AND ERECTOR CRANE NEEDS CABLE SAVER

EVERY OCEAN TUG WITH TOWING WINCH NEEDS CABLE SAVER

ATLANTIS SERVICES, INC.

CABLE $AVER

1057 Kings Avenue, Jacksonville, FL 32207, **(904)** 396-8606

Circle 170 on Reader Service Card

Laursen Selected As New Managing Director Of Hemple Holding

Knud Laursen

The new corporate managing director of J.C. Hempel Holding A/S, the parent company for all foreign and associate companies of the Hempel Group, is to be **Knud Laursen**. He joined the Hempel Group, a worldwide supplier of marine and industrial coatings, on September 1 this year, and take full responsibility as managing director of the company effective January 1, 1986.

Mr. **Laursen** succeeds the present managing director, **Chr Mjelva**, who will retire at the end of 1985 after 17 years of service with the Hempel Group.

Prior to joining Hempel, Mr. **Laursen** was director of Superfos A/S, with responsibility for Superfos Chemical Industry A/S, the company's chemical division, which also includes Superfos Kemi A/S, Dansk Ammoniak A/S, Aerosols International Schadinavia A/S, and Superfos Chemicals A/S. He had previously worked for EAC Data and Mobil Oil, and has broad international experience.

Owen And Richards Named Managers At Honeywell's Marine Systems Division

As part of an ongoing effort to strengthen its responsiveness to the offshore industry, Honeywell's Marine Systems Division has announced two new appointments.

John D. Owen has been named systems business manager. He joined the offshore industry in 1970 and has held a variety of program management and engineering positions. The systems business area includes engineering services and offshore control and monitoring systems. This area has supported such innovative offshore programs as Exxon's Lena guyed tower installation.

Caroline Z. Richards has been appointed acoustics business manager. She has been involved with acoustic product marketing at Honeywell since 1975. Products in the acoustics business area include the HydroStar subsea tracking and relocation system, the new RigStar rig positioning and riser angle monitoring system, and a new line of acoustic beacons.

The two new managers will share the marketing responsibilities previously handled by **L. Charles Meeks**.

Daewoo's Exports Climbed To Nearly $1.26 Billion During First Half of '85

Daewoo Corporation's exports rose to nearly $1.26 billion during the first half of this year, a 14.4-percent increase over exports during the same period of 1984, the company has announced. The Korean company's leading exports were ships and offshore structures, steel and steel products, textiles, electrical and electronics products, and chemicals.

Daewoo's exports of ships and offshore structures, including four big containerships delivered to United States Lines, increased some 23 percent to about $425 million during the period.

Barber Lines Names Northwest Managers

Two maritime veterans have been appointed district managers for the Seattle and Portland offices of Barber Steamship Lines, Inc., it was announced by **Frank M. Cangemi,** executive vice president.

Ms. **Holly Land,** who began her shipping career at General Steam-

ship in 1947, will serve as district manager at Portland, and **Lloyd Westby,** for more than two decades associated with Overseas Shipping in Portland and Dodwell of Washington, will head the Seattle operation.

The Pacific Northwest offices were established several months ago in accord with Barber's long-range growth plans, Mr. **Cangemi** said.

Hollming Opens Louisiana Office For Marketing Aquamaster Product Line —Literature Available

Hollming, Ltd., the Finnish shipbuilding and engineering group, has opened offices in Louisiana. The objective is to promote and conduct marketing of the Aquamaster Azimuth propulsion units and support sales and service activities in the U.S. and Canada. The office is managed by **Teuvo Ronkainen.**

The aquamaster product line consists of azimuth propulsion units (Z-drives) from 150 hp to 4,000 hp.

The Aquamaster propulsion system includes Aquapilot steering control permitting flexible control arrangement with several steering places. Also, Micropilot, so-called "joy stick" control, is available integrating all the thrust elements of a control vessel to the single steering lever. Both Aquapilot and Micropilot are based on microprocessor technology.

Aquamaster units are in operation under arctic and tropical conditions and almost 800 Aquamaster propulsion units have been delivered worldwide for vessels ranging from tugs, barges, offshore vessels, coastal cargoships, ferries, a 1,600-ton lifting capacity crane vessel and a drill ship with interfacing for dynamic positioning.

For further information and free literature from Hollming,

Circle 51 on Reader Service Card

Research Analysis Awarded $16-Million Navy Contract For Technical Support

Research Analysis and Management Corporation of Rockville, Md., has been awarded a $16,280,171 cost-plus-fixed-fee Navy contract for technical support for the NAVSEA's fleet modernization program. Work is expected to be completed in September 1987. Contract funds would not have expired at the end of the current fiscal year. Eighty bids were solicited and five offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-D-4563).

Two New Instruments To Measure Current/Voltage Introduced By Amprobe —Literature Available

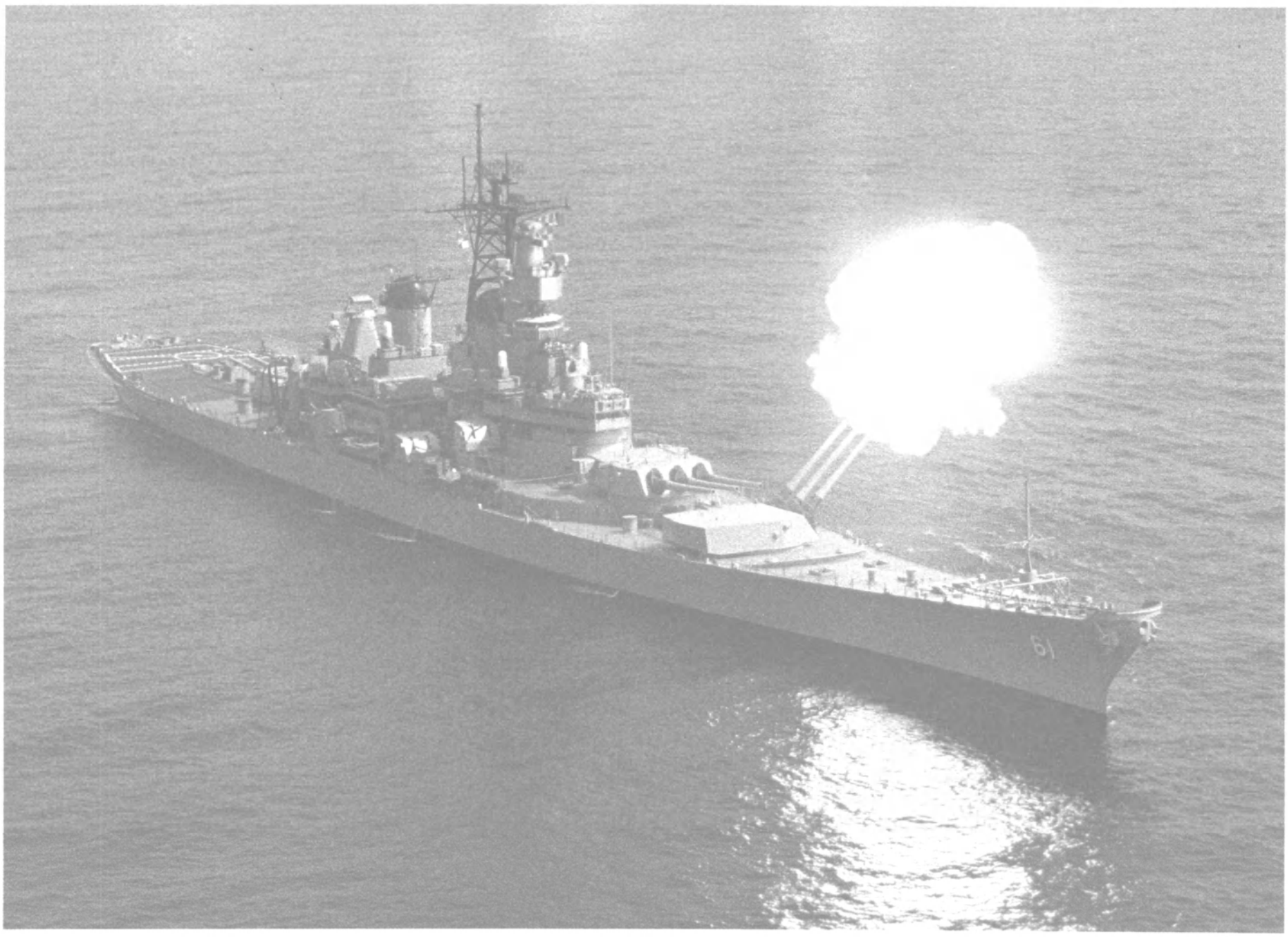
The new digital clamp-on instruments capable of measuring both DC and AC current and voltage have been introduced by Amprobe Instruments division of Core Industries, Inc. of Lynbrook, N.Y.

Model ACDC1000 measures AC or DC currents and voltages on two ranges up to 999 amperes, or volts in either a "continuous" mode or a "peak" mode for measuring and locking in surges such as motor starting currents. In the continuous mode it can monitor fluctuating variables. It also has an ohmmeter function for measuring resistances up to 1,999 on two ranges. In the peak mode, the ACDC 1000 is peak-sensing, RMS-reading. The AC frequency response is 40 to 400 Hz; the response time in the peak mode is 0.08 seconds.

The second unit, model ACDC1001, offers AC and DC current and voltage measuring capability in a continuous mode. Both are autoranging within the selected function. A unique circuit design permits the new units to measure a wide variety of DC inputs from continuous to chopped DC as found in SCR circuits (30 to 300 Hz with duty cycle of 20 to 90 percent). When measuring AC in the continuous mode, both instruments are average-sensing, RMS-reading.

For additional information on these instruments,

Circle 45 on Reader Service Card



U.S. NAVY SHIP PROCUREMENT
— An Update —

by James McCaul, President
International Maritime Associates

This article is an excerpt from the first quarterly update to International Maritime Associates' report on U.S. Navy Ship Procurement. It is divided into five sections:

- legislative action
- program developments
- industry activity
- projected market
- revised Navy points of contact

Information is current as of 1 August, except as noted.

1. LEGISLATIVE ACTION

House/Senate conferees in late July reached a compromise on the FY 1986 defense authorization bill. The compromise provides defense spending authority of $302.5 billion. This compares with the administration request for $322.2 billion.

The Senate adopted the conferees' compromise on 30 July. House Democrat leaders put off a decision until September. An appropriations bill is still required to actually fund the program.

Shipbuilding and Conversion

The authorization bill provides $10.0 billion for shipbuilding and conversion in FY 1986. This compares with the Administration request for $11.4 billion. Data showing House, Senate and Conference actions are provided in Exhibit 1.

Very little change in the program is imposed by the authorization bill. The House agreed in conference to accept the Senate reduction of two mine countermeasure ships (MCM). Four MCM's had been requested in the budget. Congress deferred approval of the lead torpedo range tender proposed for next year. The Senate agreed in conference with the House to add $25 million for strategic sealift. Other changes involve minor funding reductions in specific programs, a general overall program funding cut of $100 million, and transfer of funding from prior years.

Weapons

DOD proposed to spend $5.6 billion next year for missiles, torpedoes and other Navy weapon systems. As shown in Exhibit 2 Congress cut several programs by a small percentage—but generally left the procurement plan intact. Additional funding was authorized for Sidewinder and Sidearm missiles. The Senate added $60 million for 150 MK-60 Captor mines—and the House agreed in conference. DOD had not requested funding for Captor mine purchases. As a result of these additions authorized spending for Navy weapons slightly exceeds the DOD budget request.

Other Navy Procurement

A budget of $6.6 billion was proposed for Navy electronics and support equipment. House/Senate conferees agreed to authorize $6.0 billion. As shown in Exhibit 3 some minor changes were made. The House added $12 million to buy

eight AN/BLD-1 microwave intercept receivers. Navy had not planned to buy these units until FY 1988. The Senate added $13 million for communications equipment and civil engineering support equipment for the 9th battalion. Navy had not requested this funding. An additional $35 million was authorized the House to purchase 150,000 low-cost sonobuoys and $12 million was added for seashed procurement.

Research and Development

DOD proposed an $11.3 billion budget for research, development, test and evaluation programs. Congress authorized $10.1 billion for these programs. A comparison of the budget request and Congressional action is shown in Exhibit 4.

Congress refused to authorize the full budget request in 76 RDT&E programs. It added or increased spending authorization for 14 programs.

Several Navy missile programs cut by the House were partially reinstated by the conferees. The House had refused to authorize development of the advanced surface-to-air missile (ASAM), the rolling airframe missile (RAM) and the advanced medium range air-to-air missile (AMRAMM). Each of these programs was authorized by conference agreement, but at a lower figure than requested by DOD.

2. PROGRAM DEVELOPMENTS

Detail design work has begun on DDG 51, the first T-5 tanker was delivered, and MSC has issued an RFP for contract operation of range instrumentation ships.

DDG 51 Engineering Work Begins At Bath

Bath received a $322 million contract on 2 April to build the lead Aegis destroyer. Fabrication is to begin in May 1987. Delivery is scheduled in September 1989. Contract milestones for the DDG 51 are shown in Exhibit 5.

First T-5 Tanker Delivered

Tampa delivered Paul Buck, first of five T-5 tankers to Ocean Product Tankers (who has a charter with MSC) in early April. The remaining four ships are due for delivery over the next ten months:

Darnell	15 August 1985
Cobb	11 November 1985
Mathieson	10 February 1986
Gianella	12 May 1986

Extensive subcontracting was employed to build the ships and major start-up problems were encountered. Avondale built the bow and midbody sections. Alabama Drydock built the deckhouses. Stern modules were built at a Florida facility owned by Westinghouse. Bond restrictions prevented Tampa from using its existing graving dock for new construction. Tampa is understood to have invested $25 million in new facilities to assemble the ships. Yard top management has changed several times since the program began.

MSC Solicits Bids To Operate Two Range Instrumentation Ships

The Military Sealift Command has issued a request for proposal to operate the instrumentation ships Observation Island and Redstone for three years. This solicitation is part of a cost comparison study (called an A-76 study) being made under guidelines specified by the Office of Management and Budget. Prices obtained from prospective contractors will be compared to government operation costs. If found more cost-effective the ships will be switched to contract operation.

Interested firms should contact **Frances Gapp** at (301) 427-5694.

(continued on page 32)

Navy

Exhibit 1 FY 1986 Shipbuilding Program
(dollars in millions)

	Budget Request		House Authorization		Senate Authorization		Conference Agreement	
	Qty	$	Qty	$	Qty	$	Qty	$
Trident	1	1,531.8	1	1,531.8	1	1,431.8	1	1,481.8
SSN-688	4	2,708.4	4	2,708.4	4	2,698.4	4	2,698.4
BB-React	AP	53.5	AP	53.5	AP	53.5	AP	53.5
CV-SLEP	AP	133.4	AP	133.4	AP	133.4	AP	133.4
CG-47	3	2,766.2	3	2,766.2	3	2,766.2	3	2,766.2
DDG-51	AP	164.3	AP	164.3	AP	164.3	AP	164.3
LSD-41	2	414.4	2	414.4	2	414.4	2	414.4
LHD-1	1	1,507.2	1	1,314.2	1	1,314.2	1	1,314.2
MCM	4	334.1	4	334.1	2	167.1	2	167.1
MSH	4	184.5	4	184.5	4	184.5	4	184.5
TAO	2	328.5	2	328.5	2	328.5	2	328.5
TAGOS	2	115.1	2	115.1	2	115.1	2	115.1
AG (conv)	1	68.9	1	68.9	1	68.9	1	68.9
TACS (conv)	3	82.5	3	82.5	3	82.5	3	82.5
TAVB (conv)	1	26.9	1	26.9	1	26.9	1	26.9
MTSD	AP	26.5	AP	26.5	AP	26.5	AP	26.5
LCAC	12	307.0	12	307.0	12	307.0	12	307.0
Landing craft	3	34.4	3	34.4	3	34.4	3	34.4
Service craft[2]	13	79.5	12	37.7	12	37.7	12	37.7
Strategic sealift	—	203.4	—	228.4	—	203.4	—	228.4
Outfitting	—	228.5	—	228.5	—	228.5	—	228.5
Past delivery	—	112.6	—	112.6	—	112.6	—	112.6
General reduction/ transfer	—	N.A.	—	(1,709.4)	—	(973.6)	—	(973.6)
Total Budget		**11,411.6**		**9,492.4**		**9,926.2**		**10,001.2**
No. of Ships:								
Major New Ships	23		23		21		21	
Air Cushion LCAC's	12		12		12		12	
Service/Conv. Landing Craft	16		15		15		15	
Conversions	5		5		5		5	

Notes: 1. AP = advanced procurement
2. Request was for two open lighters (YC), two floating cranes (YD), two covered lighters (YFN), six patrol craft (YP) and one torpedo range tender (YFRT); Congress deferred approval of the torpedo range tender (YFRT).

Source: House and Senate Reports.

Exhibit 2 FY 1986 Weapons Procurement
(dollars in millions)

	Budget Request		House Authorization		Senate Authorization		Conference Agreement	
	Qty	$	Qty	$	Qty	$	Qty	$
Missiles								
Trident	N.A.	685.3	N.A.	675.3	N.A.	645.3	N.A.	645.3
Tomahawk	249	734.8	249	734.8	249	724.8	249	724.8
Sparrow	1,872	368.7	1,872	359.2	1,872	368.7	1,872	359.2
Sidewinder	1,220	93.8	1,850	125.8	1,220	93.8	1,850	125.8
Phoenix	265	381.9	265	368.4	265	381.9	265	368.4
Harpoon	395	314.9	395	314.9	395	314.9	395	314.9
Harm	904	258.0	904	258.0	904	258.0	904	258.0
SM-I MR	—	35.9	—	26.4	—	35.9	—	35.9
SM-2 MR	846	509.7	846	509.7	846	509.7	846	509.7
SM-2 ER	470	312.2	470	312.2	470	312.2	470	312.2
RAM	117	44.7	117	44.7	117	44.7	117	44.7
Sidearm	168	20.5	885	80.0	168	20.5	885	80.0
Hellfire	1,304	55.1	1,304	55.1	1,304	55.1	1,304	55.1
Laser Maverick	1,500	194.3	1,500	194.3	1,500	194.3	1,500	194.3
II R Maverick	195	27.8	195	27.8	195	27.8	195	27.8
Other	—	378.1	—	421.1	—	329.3	—	374.3
Subtotal		**4,415.7**		**4,507.7**		**4,316.9**		**4,430.4**
Torpedoes/Mines								
MK-48 ADCAP	123	417.4	123	417.4	123	417.4	123	417.4
MK-46	500	129.1	500	129.1	500	129.1	500	129.1
MK-60 Captor	—	—	—	—	150	59.6	150	59.6
Other	—	251.5	—	251.5	—	247.5	—	251.5
Subtotal		**798.0**		**798.0**		**853.6**		**857.6**
Guns								
MK-15 CIWS	39	150.1	39	150.1	39	150.1	39	150.1
Other	—	97.3	—	97.3	—	79.9	—	97.3
Subtotal		**247.4**		**247.4**		**230.0**		**247.4**
Spares	—	166.6	—	166.6	—	116.6		166.6
General reduction/ transfer		—		(316.6)		(47.0)		(47.0)
Total Budget		**5,627.9**		**5,403.3**		**5,470.2**		**5,655.1**

Notes: 1. Includes some funding for Poseidon missiles.
Source: House and Senate Reports.

(continued)

The solicitation number is N00033-85-R-4003. Closing date is 30 October 1985.

3. INDUSTRIAL ACTIVITY

The U.S. shipbuilding business continues to be driven by Navy work. Competition for available projects is intense.

NASSCO Backlog Down, Prospects Limited

As of 30 June, NASSCO's backlog was $547 million, down from $610 million one year ago. Management reports that "prospects for significant additions of new work in the near and midterm appear to be limited."

GD To Close Quincy

In late July, GD announced plans to close the Quincy shipyard in 1986. The yard employs 4,200 people. Quincy is completing the five ship T-AKX contract it won from MSC in 1982. The final blow appeared to be losing two recent Navy contracts (T-AO and T-AGS).

GD to Cut Employment At Electric Boat

GD said 700 to 900 jobs (out of 26,000) will be eliminated at the Electric Boat division. Trident and attack submarines are built at this facility. GD management attributed the job reduction to cancellation of submarine contracts in 1981.

Tacoma Skirting Chapter XI

At the annual stockholders meeting in July, the new co-chairman of Tacoma Boatbuilding said he "hopes financial and managerial reorganizations underway will enable the concern to avoid filing under Chapter XI of the Federal Bankruptcy Code." Tacoma had a first quarter loss of $4 million on revenue of $26.3 million. Former Rear Admiral **E.T. Westfall** has been named president of the company, with a $350,000 per year employment contract for five years. The firm is building 12 T-AGOS ships for Navy, seven of which are still under construction.

Ogden to Sell Avondale

Ogden in July announced plans to spin off Avondale. A new company will be formed called Avondale Corporation. Ogden will sell the shipyard and industrial products businesses to an employee stock ownership plan for $375 million in cash and preferred stock. $270 million will be raised by sale of common stock to the ESOP. The remaining $105 million will be raised from convertible preferred stock held by Ogden.

Todd Said On Verge Of Acquisition

Todd is actively trying to diversi-

Exhibit 3 FY 1986 Navy Other Procurement
(in millions of dollars)

	Budget Request	House Authorization	Senate Authorization	Conference Agreement
Ship support equipment	923.0	908.0	935.0	935.0
Comm. and elect. equip.	2,154.0	2,085.8	2,111.7	2,134.5
Aviation support	1,184.0	1,187.2	1,124.0	1,206.8
Ordnance support	1,396.5	1,326.5	1,396.5	1,396.5
Civil eng. support	221.6	221.6	232.6	232.6
Supply support	62.5	62.5	62.5	62.5
Personnel & command support	379.8	376.6	389.9	389.9
Spares & repair parts	279.8	269.8	279.8	279.8
Noncentrally managed items	—	170.8	—	125.3
General reduction/transfer		(617.3)	(1,252.6)	(772.0)
Total Budget	**6,601.2**	**5,991.5**	**5,279.4**	**6,040.8**

Source: House and Senate Reports.

Exhibit 4 FY 1986 Research, Development, Test and Evaluation Budget
(in millions of dollars)

	Budget Request	House Authorization	Senate Authorization	Conference Agreement
Technology base	853.2	847.9	833.7	840.8
Advanced tech. div.	239.4	202.3	209.7	214.8
Strategic programs	2,482.0	2,294.1	2,458.0	2,430.5
Tactical programs	6,161.0	5,241.1	5,777.9	5,447.9
Intelligence & commun.	704.0	558.1	646.0	595.3
Defensewide support mission	824.7	795.8	736.8	763.5
General reduction/additions/ transfer	—	(301.7)	(193.7)	(186.4)
Total	**11,264.3**	**9,637.6**	**10,468.6**	**10,106.4**

Source: House and Senate Reports.

Exhibit 5 DDG-51 Contract Milestones

MILESTONE EVENTS	DATE
Start Fabrication Complete layout, cutting, and shaping of first 100 tons of hull structure.	05-10-87
Lay Keel Erection of the first assembled unit on the building ways or equivalent.	12-14-87
Load Main Machinery Propulsion machinery in position, but not aligned, and structure required for its installation complete.	02-28-88
Complete Hull Assembly/ Integration All units and superstructure erected and assembled on building ways or equivalent.	07-17-88
Launch/Float-Off Ship launched from building ways and moored at pier.	08-21-88*
Start Combat System Test Completion of Contractor support system tests which will support uninterrupted testing for Navy stage 3-7 testing.	12-18-88
Start Dock Trials Commence operational dockside checkout of main propulsion and auxiliary system in preparation for builder's trials.	06-04-89
Compartment Completion Inspection Rept. 100 percent of Compartment Completion Inspection Reports submitted.	07-02-89
Inclining Accomplished in accordance with the Ship Specifications Section 097.	06-11-89
Complete Trial ALPHA Shipbuilder operates ship at sea for preliminary demonstration of machinery and for limited combat system demonstrations.	06-18-89
Complete Trial BRAVO (Builder's Trials) Shipbuilder operates ship at sea, verifies operability of ship subsystem equipments and components as prerequisite to acceptance trials. Phase one will constitute firing all ship's armament, including missiles. Phase two will be a Mock INSURV trial.	07-09-89
Allowance Shortage Lists (a) Submit 60 days prior to Trial CHARLIE	06-04-89
(b) Submit at start of Trial CHARLIE	07-30-89
(c) Submit at ship delivery	09-24-89
Complete Trial CHARLIE (Acceptance Trials) Completion verifies operability and performance of ship subsystems and components and signifies readiness for delivery to Navy.	08-06-89
Delivery of Ship Satisfactory fulfillment of contract requirements and preliminary acceptance by Navy.	09-24-89
Complete Guaranty Period Satisfactory fulfillment of contract requirements and final acceptance by Navy.	06-24-90

*Note: IThe launch date is subject to suitability of tide conditions and a maximum variation of ± 3 weeks from the date shown above.

Source: Contract No. N00024-85-C-2144

fy its business base. At the annual stockholders meeting on 17 July, Todd management indicated progress in acquiring a second core business. The chairman said Todd is now making a financial and business investigation of a specific company with volume of about $100 million.

Bath Employees On Strike

A major, potentially lengthy work stoppage brought yard production to a halt at Bath Iron Works at the end of June. The issues involve a proposed wage freeze and reduction in benefits. The strike will delay launching of the CG-51 and impact other new construction and overhaul work in the yard. It is not impacting the DDG 51 at this time, as work is still in the engineering phase.

(continued on page 34)

(CONTINUES)

Marine Transport Awarded Oceanographic Ship Operating Contract

MTL received a $79.6 million fixed-price contract with cost reimbursables to operate 12 MSC oceanographic ships. The contract extends over a three-year period. MTL was one of four bidders for this contract.

Avondale Awarded Three Additional T-AO's

In June the yard received a $321 million fixed-price incentive contract to build up to three T-AO 187 fleet oilers. Avondale had already received contracts for four ships in this class. Four shipyards competed for this contract.

Pennship Awarded Two T-AO's

In early May Navy awarded a $222.5 million fixed-price-incentive contract to Pennship for two T-AO 187 fleet oilers. The firm is now the second source for this class of ship. Five firms competed for this contract.

Bethlehem-Sparrows Point Awarded Two T-AGS

Navy in late June awarded a $132.8 million fixed-price contract to Bethlehem Steel to build two T-AGS oceanographic survey ships. It was one of three bidders for the contract. Without this work it was hard to see how the yard could survive. According to industry sources, Bethlehem Steel's offer was 17-25 percent lower than competing bids.

Halter Marine Awarded Six Ship T-AGOS Contract

In April Halter received an $85.5 million fixed-price contract to build six ocean surveillance ships. The first 12 ships in this class were contracted to Tacoma Boatbuilding. Thirteen firms competed for this contract.

4. PROJECTED MARKET

The shipbuilding program will continue to throw off business opportunities for many types of companies.

New DOD Industry Forecasts

Exhibit 8 of the Complete August Update shows projected demand to be directly or indirectly generated in specific industry sectors by the Navy shipbuilding program. These numbers are based on the FY 1986 budget request and accompanying five year shipbuilding plan. They update data shown on pp. 63-64 in the IMA May report.

Use of These Data

Readers should treat these projections with caution. Their accuracy depends on the assumptions used in the I/O modeling technique. It is recommended that a copy of "Defense Purchases: An Introduction to DEIMS" be obtained and studied. This booklet describes the methodology used to make these forecasts. It can be obtained from the DOD Office of Industrial Base Assessment, 5203 Leesburg Pike, Falls Church, Virginia 22401.

5. REVISED NAVY POINTS OF CONTACT

Two changes have been made in the business-end of the Navy organization and some new names appear among the key contacts.

Naval Material Command Eliminated

For years the Naval Material Command has been regarded an unnecessary organization layer. In April the issue was resolved by its elimination.

Many of the Material Command functions were absorbed into a new organization—the Office of Naval Acquisition Support. Each of the five systems commanders now report directly to the Chief of Naval Operations for progam execution, and to the Secretary of Navy for policy.

NAVELEX Renamed

The Naval Electronic Systems Command was renamed the Space and Naval Warfare Command.

New NAVSEA and NAVELEX Commanders

VAdm. **Rowden** was named commander of NAVSEA. He had commanded the MSC. VAdm. **Clark** was selected to head the Space and Naval Warfare Command. He had headed the Strategic Systems Program Office.

International Maritime Associates, Inc. (IMA) specializes in strategic market planning. The firm's services include market research, acquisition studies, competitive analyses, and assistance in long term product/market positioning. Among its clients are more than 80 organizations in 18 countries.

As one of its services IMA regularly publishes special market surveys. Each survey deals with a subject of wide interest.

For further information on IMA's services and market surveys,

Circle 93 on Reader Service Card

Thermal Reduction Offers New Brochure On Metal Products Line

The Thermal Reduction Company, Riverside, N.J., is offering a newly revised brochure on their complete line of metal products. The products offered by the company include: marine corrosion protection; copper; brass; lead; zinc; tin/ tin-lead/ solder; alloys; cadmium/ nickel; antimony; aluminium; and magnesium.

According to the brochure, Thermal Reduction is one of the world's largest manufacturers and suppliers of marine corrosion protection. The company reportedly has a reputation for quality and on-time delivery.

The brochure, which is in its third revision, is broken in to two main sections. The first section contains text on the company's marine corrosion protection products and the second section is devoted to mill and foundry products.

For a free copy of the Thermal Reduction Company's brochure,

Circle 54 on Reader Service Card

ADS Workshop Scheduled For October 2-3 In Chicago

"Getting Your Next Customer—and Keeping the Ones You Have" is the subject of a special workshop to be presented October 2-3 by the Association of Diesel Specialists, announced ADS president **Harold Klebanoff,** LaBan Equipment Corp., Valley Stream, N.Y. The workshop will be held at the Ramada Hotel O'Hare, Chicago, Ill.

"Marketing and sales planning is more important than ever in the diesel fuel injection service business," said Mr. **Klebanoff.** "Our industry is long past the point where a diesel shop can simply open for business and expect the customers to start flowing in," he said.

The workshop will provide ADS members with information which they can take back to their shops and put into practice, according to Mr. **Klebanoff.** The subject areas to be covered include: "What is marketing, and where does it fit into your business?," "Setting realistic goals, and tying them into company objectives," "Ways to make your company's individual characteristics work to your advantage," "The roles of top management and sales management, and how they are different," and "What does your customer think of you? Does it matter?"

Designed for business owners, general managers and sales managers, the workshop is presented by the Association of Diesel Specialists in cooperation with the Fromm Institute, Kansas City, Mo. as a special service to ADS members.

For more information on the workshop, contact **Louis A. Zuanich** at ADS headquarters, 9140 Ward Parkway, Kansas City, Mo. 64114, (816) 444-3500.

Three Major Beth Steel Programs Highlight New Offerings To The Offshore Industry

Bethlehem Steel Corporation officials recently provided an update on three major programs in which the company's marine construction group is involved:

• A 64,000-ton-capacitv sectional drydock that will be installed at the firm's new 100-acre repair yard on the Sabine-Neches Ship Channel in Port Arthur, Texas.

• A new generation mat-supported offshore jackup rig, named The Bethlehem 600, that can drill in 600-foot water depths.

• A tension leg platform (TLP) design incorporating highly advanced offshore oil production technology.

David H. Klinges, vice president of marine construction at Bethlehem, noted that modification work at the company's Beaumont, Texas, yard is nearing completion for the 64,000-ton-capacity drydock, one of the nation's largest, and that the initial construction phase is well underway for the new Sabine Yard where the drydock will be moored. Work required by Bethlehem to prepare the site at the Sabine Yard included dredging some two million cubic yards of material from Pleasure Island in Port Arthur, erection of an office facility, rerouting of two miles of Texas Highway 82, developing a parking area and construction of an electrical power substation.

The eight-section, ex-U.S. Navy drydock (built during World War II) was transported from Pearl Harbor, Hawaii, to the Gulf aboard the heavy-lift vessels Dyvi Tern and Dyvi Tial, each carrying four sections. The sections were then brought by tugboat to Bethlehem's Beaumont yard for modification and reactivation. Following completion of the work, the drydock sections will be towed downriver to the Sabine Yard where they will be joined in a configuration to meet customer requirements. The drydock is now owned by the Port of Port Arthur, with whom Bethlehem has an operating agreement.

During the 40 years the drydock was idle it was kept in a state of preserved lay-up. A dehumidifying system kept all interior space moisture-free to prevent the formation of rust, and all machinery was coated with a protective compound. Cathodic protection was provided for the hull of the drydock sections below water and paint was applied to the above-water portions of the units.

For rigs, the eight sections can be arranged in two side-by-side batteries of four sections each. This provides a clear docking area of 413 by 362 feet. To accommodate drillships, as many as eight sections can be lined up in tandem for a clear docking area of 829 by 122 feet.

The new drydock will have enough lifting power and size capacity to service any mobile offshore unit working in the Gulf, including jackups (mat-supported or independent-leg), semisubmersibles, submersibles and drillships. If needed, the Beaumont Yard's 500-ton-capacity derrick barge can be placed into service at the Sabine Yard as a supplement to the smaller cranes that are part of the drydock units.

In addition to electrical generating equipment, utility capacity, and cranes, the dock is equipped with machine, carpenter and electrical shops, and has more than 28,000 square feet of potential office and shop space in the wing walls.

Mr. **Klinges** said the new Sabine Yard will have greater flexibility than any other rig repair facility in the Gulf area. Since it is located only eight nautical miles upstream from the anchorage at Sabine Pass and there are no bridges to restrict marine traffic, it will provide easy access from and to the Gulf of Mexico.

Employment at the new yard could grow to approximately 750 in the initial development phase, according to Mr. **Klinges,** with additional employment opportunities as phases two and three are implemented.

The Bethlehem 600

Since introduction of The Bethlehem 600 last year, a number of modifications and refinements have been made in response to customer requirements expressed during Bethlehem's presentations to representatives of oil companies and drilling contractors.

The cantilever mat jackup, the world's largest unit of this type, is designed for work in hostile environments and for long periods in remote areas where resupply may be difficult. It has been estimated that The Bethlehem 600 will be able to work in more than one million square miles of prospective oil producing regions throughout the world, with water depths ranging from 250 to 600 feet (an area nearly double that of the Gulf of Mexico, spread out along the coastlines of the world).

TLP Program

Bethlehem entered the TLP (tension leg platform) market with the signing of a licensing agreement with Fluor Engineers, Inc. that assigns Bethlehem exclusive rights on TLPs designed by Fluor for installation on the Gulf and East Coasts of North and South America and the Caribbean. In commenting on the agreement, Mr. **Klinges** said: "Our objective is to work together to design, fabricate, outfit and install a TLP in the Gulf of Mexico."

Assisting Mr. **Klinges** at the news update were **Sherman C. Perry,** general manager of Bethlehem's Beaumont, Texas, yard; **Richard E. Blackinton,** general manager, operations and facilities; **Frank Richardson,** manager of the new Sabine Yard under construction on Pleasure Island, Port Arthur, Texas.

Mr. **Klinges** concluded that despite current depressed conditions in the industry, "We're confident that we are in a good position to service our customers with the facilities and the technological know-how that they require. As business improves we will be able to build to satisfy the special requirments of the oil patch."

For free literature on Bethlehem Steel's new programs,

Circle 14 on Reader Service Card

Wood Joins Nicor Marine As Manager Of New Sales Office In Lafayette, La.

Al Wood has joined Nicor Marine Inc. as manager of the company's newly opened LaFayette, La., sales office.

Mr. **Wood** was employed as sales representative for two major offshore service companies from 1980-85. He is a member of the International Association of Drilling Contractors and American Petroleum Institute.

LiCausi Establishes New Boiler Consultant Firm

A.C. LiCausi, Inc., a marine and industrial boiler consultant firm serving the maritime and industrial boiler user, has been formed in New Orleans, La., by **A.C. LiCausi**, president of the firm.

A 1951 graduate of Stevens Institute of Technology, Mr. **LiCausi** was Foster Wheeler Boiler Corporation's manager-marine sales, Gulf Coast and Southwest regions, as well as product manager, marine marketing and sales for all Foster Wheeler Boiler Corporation's marine activities.

Mr. **LiCausi's** experience and responsibilities have spanned the field of marine and naval auxiliary, waste heat, and main propulsion boilers, from proposal preparation to guarantee claims settlement, including design, erection, service, sea trials, problem analysis and contract negotiation. He has conducted business with shipowners, shipbuilders, and naval architects throughout the U.S. in addition to Navsea, MarAd, SupShips, USCG, MSC, and ABS on both the local and national level.

His services are offered to these areas as well as to the maritime legal community.

Other experience includes coal-fired fluidized bed boilers, municipal solid waste disposal, commercial incineration, and cogeneration.

Mr. **LiCausi** is a member of the Propeller Club, Port of New Orleans, The Society of Naval Architects and Marine Engineers, and the American Society of Naval Engineers. He is a past chariman of the Pascagoula Section of ASNE, has authored technical papers, holds several marine boiler patents and has been a guest speaker at marine society meetings across the country.

Mr. **LiCausi's** office is located at 5366 Tullis Drive, New Orleans, La. 70114 (P.O. Box 1741, Gretna, La. 70053). The telephone number is (504) 393-0093.

Secretary Dole Appoints W.A. Creelman Deputy Maritime Administrator

Secretary of Transportation **Elizabeth Hanford Dole** recently announced her intent to appoint **William A. Creelman** as Deputy Maritime Administrator for Inland Waterways and the Great Lakes.

Mr. **Creelman,** now a private consultant, retired this past spring as president of National Marine Service, Inc., St. Louis, Mo., one of the largest carriers of bulk liquids on the inland waterways.

"Mr. **Creelman** will bring to this position a wealth of maritime experience, especially in waterways transportation," Secretary **Dole** said. "He will be a strong addition to my management team in the Maritime Administration."

Marine Data Systems Symposium Issues Final Call For Papers

The Gulf Coast Section of the Marine Technology Society, sponsor of the Marine Data Systems International Symposium to be held in New Orleans April 30-May 2, 1986, invites abstracts of papers to be considered for presentation at that meeting.

Deadline for submission of abstracts is October 15, 1985. For further information contact **Ray Canada**, National Data Buoy Center, Building 1100, NSTL, Miss. 39529; (601) 688-2806.

LaChance Elected Vice President Of Phillips Cartner & Company

John A. Cartner, chairman of Phillips Cartner & Company, Inc. of Alexandria, Va., an engineering, naval architecture, and consulting firm, has announced the appointment of **Robert W. LaChance** as a vice president of the firm. He will assume responsibility military logistics and transportation activities.

Prior to joining Phillips Cartner, Mr. **LaChance** served as a principal engineer in the Logistics Support Laboratory of the U.S. Army's Belvoir Research and Development Center. In that position he served as the Army's technical authority on containers, flatracks, and refrigerated intermodal equipment. Prior to that, he was engineering manager for Line Fast Corporation, where he supervised the design of ISO and intermodal containers, securing systems, and material-handling equipment.

PROPULSION UPDATE

Detroit Diesel Allison Announces Significant Engineering Advancements To Its Series 149 Engines

Detroit Diesel Allison (DDA) Division of General Motors has announced significant engineering advancements to its Series 149 engines (now designated "Silver 149s") used extensively in mining, construction, industrial and marine applications.

One technological advancement credited with a 6 to 10 percent improvement in fuel economy is DDA's air induction system. The primary feature of this system is a blower bypass relief valve located in a special chamber between the intercooler and the blower. It operates as follows:

1. At suitable engine speed and load, the bypass valve allows air pressure on the inlet and outlet sides of the blower to equalize. This virtually eliminates the pumping load of the blower.
2. The blower continues to turn since it is driven by the gear train of the engine. However, with the pumping load removed, the blower is in a free wheeling state.
3. In this state, the blower requires minimal horsepower to operate. This savings in friction horsepower translates directly into increased fuel efficiency.

Newly-designed and re-engineered components are featured on the Silver 149s, representing state-of-the-art diesel technology.

Tube-and-Shell Oil Cooler

Available on 8V- and 16V-149TI engines, the tube-and-shell oil cooler increases engine life through decreased oil temperature, improved oil filtration and better oil flow. For each 10 degree F reduction in oil sump temperature, related componentry life is increased by approximately 50 percent. Oil filtration is improved by the addition of two more oil filters which should extend the oil and filter change intervals.

Other advantages of the new tube-and-shell cooler include increased oil flow by up to 17 percent; increased oil gallery pressure; reduced oil system restriction; and cleanable tube bundle.

Crankcase Monitor

This device senses higher-than-normal crankcase pressure resulting from piston blow-by, seal leakage or other detectable malfunctions. The crankcase monitor signals a warning to the operator so that he can shut down the engine immediately and prevent extensive engine damage.

Cylinder Kit Components

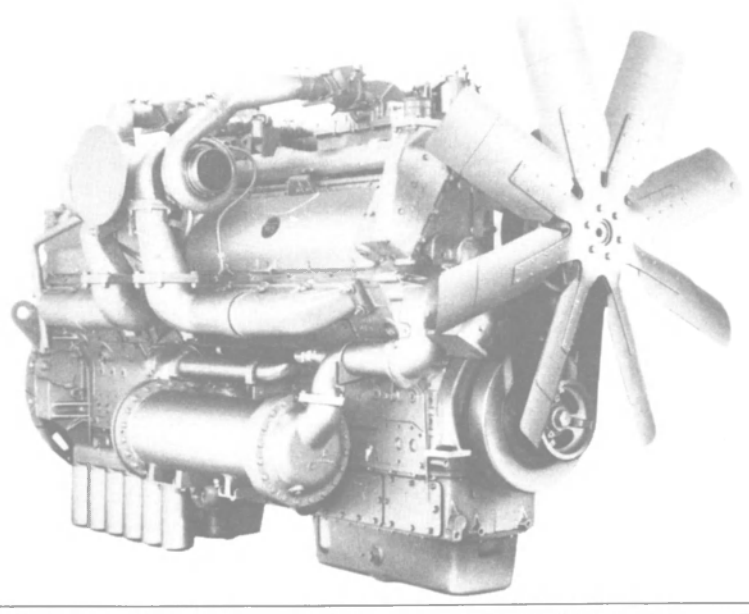
All Silver 149s use DDA's crosshead piston which features a separate crown and skirt that work independently of each other. The crown absorbs combustion forces while the skirt absorbs thrust loads. To increase the reliability of the rod-to-pin joint, the piston incorporates a new, one-piece, solid piston pin for greater durability and longer life. The new oil control ring pack can reduce oil consumption by up to 70 percent. Ring life-to-overhaul of the engine is increased significantly by maintaining uniformity of oil film across the face of the rings.

In addition to these improvements, DDA's Silver 149s provide benefits to the user in increased productivity, excellent performance at high altitudes and upgrading of the engine through a planned retrofit program.

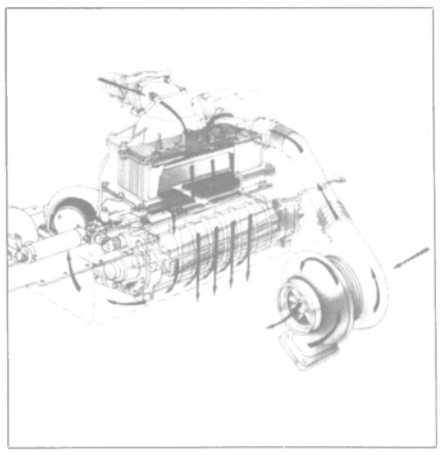
Outstanding performance at high altitudes is available from Detroit Diesel Silver 149s because turbocharging and intercooling in the engines have a tendency to minimize the effect of less dense air. The turbocharger forces more air into the air induction system, and the intercooler cools it to make it more dense. The 16V-149TI model shows no horsepower loss up to 10,000 feet and no adjustments to the fuel system are necessary.

For further literature containing full information,

Circle 15 on Reader Service Card



Detroit Diesel Allison's Series 149 engines—now designated "Silver 149s"—feature newly designed and re-engineered components representing state-of-the-art diesel technology.



The air induction system of Detroit Diesel Allison's Silver 149 turbocharged and turbocharged intercooled engines represents a major breakthrough in air flow technology.

Free 12-Page Brochure On Marine Control System Offered By Forney

The Forney Engineering Company, Carrollton, Texas, is offering a free, full-color brochure on their new AFS-1000 control system.

The three-hole binder publication offers several color photographs of the AFS-1000 and its components, along with clear, concise explanatory text.

According to the brochure, the AFS-1000 control system has gained wide acceptance in power, process and industrial control applications. The brochure states that some of the typical applications of the AFS-1000 are: burner control and mill interlock systems; boiler safety systems; interlocking logic system for plant control applications; bulk materials handling applied to coal, ash and limestone conveying systems; diesel engine control and monitoring; plantwide SCADA systems; FGDS control and monitoring; water treatment control; and emergency shutdown systems.

The booklet is broken in to 10 comprehensive sections which include: an introduction; applications; engineering; customer service and training; systems architecture; operator interface; software features; and optional equipment.

An added feature of the brochure is a complete list of Forney Engineering representatives, subsidiaries and joint ventures located in the U.S. and around the globe.

To obtain a free copy of the Forney Engineering Company brochure on their AFS-1000 control system,

Circle 50 on Reader Service Card

Gould Gets $16.9-Million Navy Contract For Towed Arrays For Submarines

Gould Defense Systems Inc. of Glen Burnie, Md., has been awarded a $16,900,000 firm-fixed-price Navy contract for 45 TB-16A/BQ towed arrays for SSN and SSBN submarines. Work is expected to be completed by October 1, 1987. Contract funds would not have expired at the end of the current fiscal year. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-6161).

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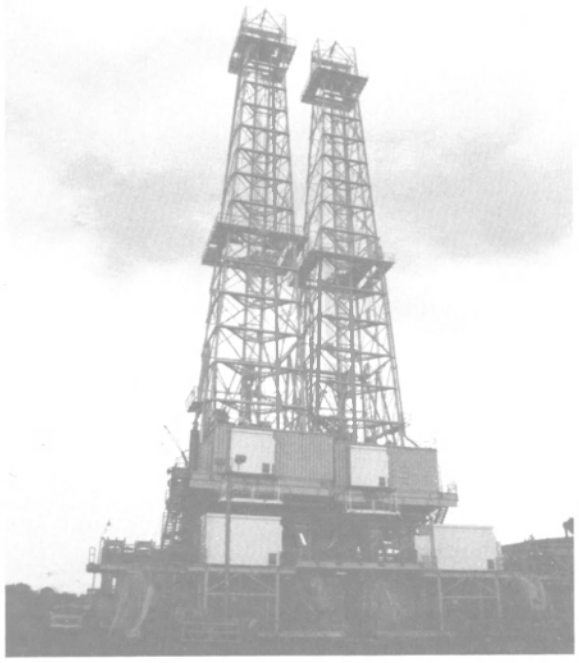
McDermott Completes Twin Drilling Rig Ordered By Helmerich & Payne International



McDermott Shipyards recently completed a specialized, twin-packaged drilling rig (shown above) for Helmerich & Payne International Drilling Company, for contract use on Texaco's Harvest "A" platform in the Santa Maria Basin, Calif. The rig was disassembled at McDermott's New Iberia, La., yard and shipped to the West Coast by rail.

The ability to disassemble the rig in packages small enough to ship by rail represents an advantage for the owner and adds a flexibility lacking in typical modular rig packages.

McDermott project engineer **Bob Wilson** explains: "As the rigs can be broken down into smaller components than conventional modules, they can be shipped by rail or truck. The smaller packages can be handled without the heavy equipment modules require; the ordinary lifting equipment available on platforms can handle these packages. On the other hand, if using heavy-lift equipment is desirable, these packages can be consolidated to make full use of the lift capacity available.

"These factors cut down on the expenses of specialized handling equipment and reliance on the availability of specialized equipment. We believe that these advantages will prove to be of increasing value to Helmerich & Payne."

The complete rig can be assembled with approximately 50 lifts using platform-mounted material-handling cranes to lift packages of 40 tons or less, and in approximately 10 lifts, depending upon completeness of package assembly, using a derrick barge to lift packages up to 500 tons.

The twin-rig unit was designed by McDermott's Hudson Engineering subsidiary's Lafayette, La., office The complete structure, which weighs approximately 1,000 tons, is designed to meet criteria for the Zone 4 seismic area and 100-year storm, as defined by API RP2A. Subassemblies are equipped with individual lifting eyes, and are bolted together using more than 3,000 bolts made of steel meeting these seismic and storm requirements.

Meyer Werft Shipyard Converts Containership Into Livestock Carrier

At the Papenburg, West Germany, shipyard of Meyer Werft the containership Ville D'Orient was converted into a combined sheep/cow carrier and recently delivered on schedule to the Turkish-Libyan Joint Maritime Transport Company of Istanbul, which will lease the ship from the principals, Islamic Development Bank of Jeddah, Saudi Arabia. For the owners, this conversion is the first step into the livestock carrying trade. The delivery ceremony took place in the presence of numerous guests from Saudi Arabia, Turkey, and Libya on board the vessel.

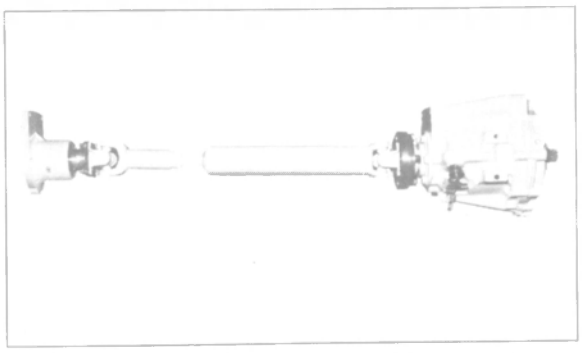
Renamed the Benwalid, the vessel has an overall length of 378.3 feet and beam of 51 feet, and was converted for worldwide trade and in compliance with the Australian Department of Trade regulations. She is capable of loading 21,300 sheep (at 110 pounds each) in 12 tiers, or 2,100 cows (at 992 pounds each) in six tiers below deck and on deck.

The ship was fitted with exchangeable aluminum deck pallets for sheep, for which Meyer Werft holds a patent. These pallets enable the ship to be re-equipped for the carriage of cows within one day. All steel decks are provided with special non-skid covering.

All the systems for the transport of cattle were developed by the shipyard itself, and improved and optimized on the basis of many years of experience. Major installations include the fodder supply system, fodder and drinking vessels of aluminum, dung removal systems, and the ventilation system. All the cow and sheep ports of the pens were made of seawater- and ammonia-resistant aluminum. For all other equipment installed, galvanized material was used.

To provide for the extra personnel required for the transport of livestock, the living quarters were expanded to accommodate 40 instead of 24 crew members. The ship was also equipped with two suitably sized new lifeboats.

Marine Drive Systems Announces New Shaft Systems —Literature Available



Marine Drive Systems of Edison, N.J., a worldwide supplier of sterndrives without engines for more than two decades, announces the availability of marine shaft systems compatible with its Stern Powr 100 Series and similar propulsion equipment.

Although shaft systems are available in many forms and sizes, a typical Stern Powr drive shaft assembly (photo) consists of a direct-drive hydraulic marine reverse gear for engine bell housing mounting, a suitable flange adapter, and 1350 size shaft elements cut to specified length and balanced. The sterndrive adapter housing interfaces with the intermediate housing of a conventional 100 Series drive after its reverse gear assembly is removed. Most shaft systems include two universal joints and a convenient slip-joint.

Use of shaft drive installations is increasingly popular in larger pleasure craft and in commercial applications. It generally improves vessel attitude by providing better balance, especially where engine weight is significant relative to total vessel displacement. It also allows for a much cleaner and open area inside the transcom, which simplifies maintenance and service and provides space for other purposes.

For more information,

Circle 33 on Reader Service Card

New X-FLO Turbo Compressor Represents Major Advance In Impeller Technology —Literature Available

Ingersoll-Rand Company, Charlotte, N.C., recently introduced the new X-FLO compressor that is said to represent a major advancement in impeller technology.

X-FLO's impeller design makes high-speed rotation possible, without the bending stress usually associated with conventional centrifugal compressors. Due to the impeller's 45 exit angles, air flows in a smooth curving direction with decreased loss.

Because the impeller is 30-40 percent smaller in diameter than typical centrifugal impellers, X-FLO is easier to install and more economical to operate and maintain. The X-FLO Air/Gas configuration's performance specifications include 2,000-175,000 cfm, Adiabatic heads to 31,000 feet, and pressures to 22 psi.

The standard construction material is cast iron, and a variety of seals are available for different gas applications. The X-FLO Air/Gas can be ordered in a variety of alternative materials, with cast steel or cast stainless steel volutes, cast steel gear case, and stainless steel or titanium impellers.

X-FLO has few moving parts, providing maintenance-free operation for extended periods of time and substantial energy savings. All models feature stainless steel inlet guide vanes as standard and utilize an easy access horizontally split gearcase for inspection or repair. Bearings are journal type throughout and can be either 3-lobe or tilting pad, depending on the application. Gearing is AGMA Class 12 or better.

Oil is provided by a shaft-driven main oil pump with an electric prelube pump. The shaft-driven lube pump runs at bull gear speed, providing continuous lubrication during operation. The main oil pump continues to provide lubrication in the event of power failures and coast-downs. The X-FLO can also comply with API requirements for chemical and refinery applications.

Industries and applications particularly suited for the X-FLO include utility, chemical/petrochemical and refining, large municipal wastewater treatment plants, food processing, mineral processing, pharmaceuticals, and pulp and paper industries.

For further information on the new X-FLO compressor from Intersoll-Rand,

Circle 26 on Reader Service Card

Ingersoll Rand's new X-FLO air/gas turbo compressor.

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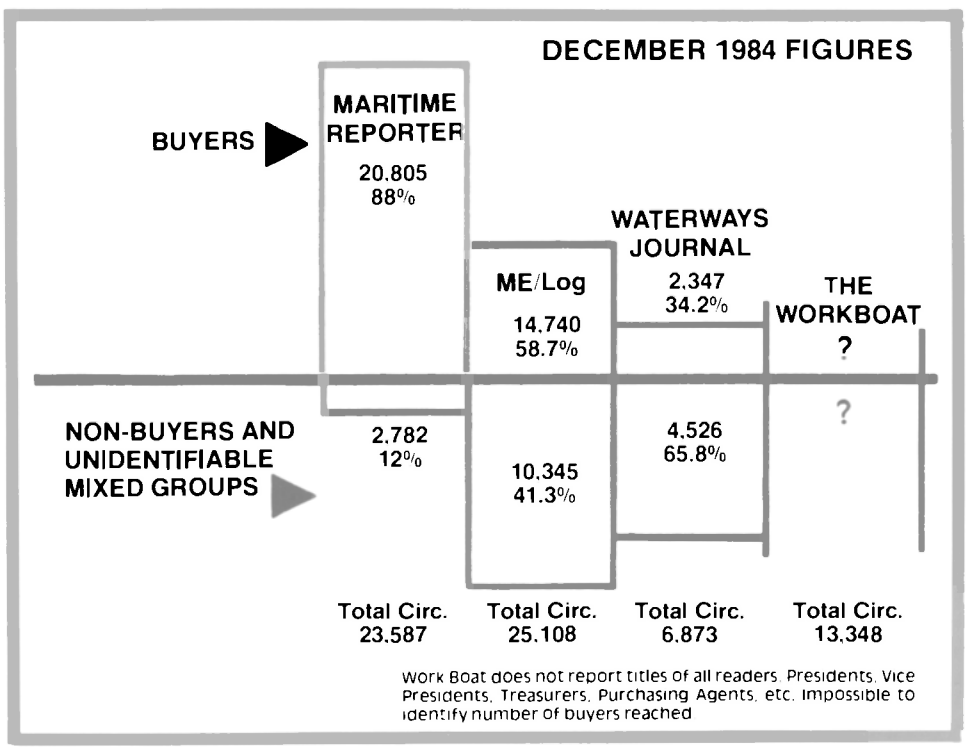

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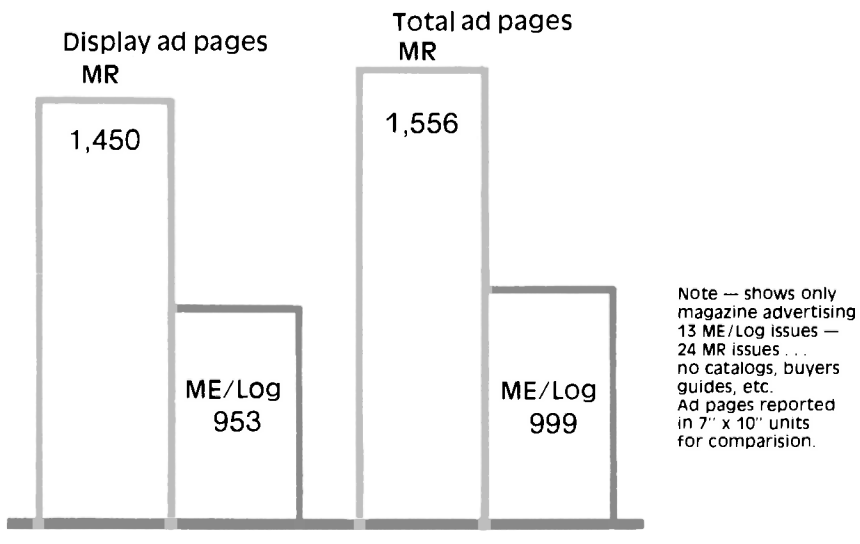

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Avondale's Harvey Division Finishes Major Refurbishing Of Offshore Tug

The Harvey Quick Repair Division of Avondale Shipyards, Inc. in Harvey, La., recently completed an extensive overhaul and re-engining of the 121-foot oceangoing tug Harvey Trojan (photo). Originally delivered by Halter Marine in 1974 as the Abdon Martin, the vessel is now owned by Harvey Gulf International. Prior to the refurbishing, the tug had been in lay-up for approximately two years. She is the 13th vessel in the Harvey Gulf fleet.

A major part of the conversion was the replacement of the two original engines with twin Stork-Werkspoor 6SW280 diesels driving four-bladed, stainless steel propellers in Kort nozzles via Reintjes WV3400 reduction gears with a ratio of 5.053:1. The gears were supplied by Karl Senner, Inc. of New Orleans when the tug was built. The overhauled engine controls were supplied by WABCO, and the steering system by Sperrv/Vickers.

The entire hull and all decks were blasted and painted, inside and out, the stern roller was overhauled, and the bow fenders were replaced. For heavy-duty towing jobs in the Gulf or worldwide, the tug is fitted with an Intercon 225, double-drum towing winch will a bollard pull of 280,000 pounds. Other deck equipment includes an HBL anchor windlass, Carlisle & Finch searchlights, and Kahlenberg air horn. Fuel oil capacity is 120,000 gallons and potable water 15,000 gallons.

In addition to the new main engines, the Trojan has two 100-kw generators driven by Detroit Diesel 8V-71 engines. These units were supplied by George Engine Company of Harvey.

The entire electronics array was replaced with new equipment. This includes two Anritsu ARM112A radars, Furuno LC-80 and Texas Instrument TI900 Loran C, Magnavox satellite navigation system, Simrad depth sounder, Sperry gyrocompass and autopilot, Ritchie magnetic compass, two Stephens SEA112 SSB radios, and two Sailor RT144 VHF radios. All electronics were supplied and installed by Bibbons & Rice of Morgan City, La.

For free literature and additional information on Avondale's Harvey Quick Repair Division facilities and services,

Circle 19 on Reader Service Card

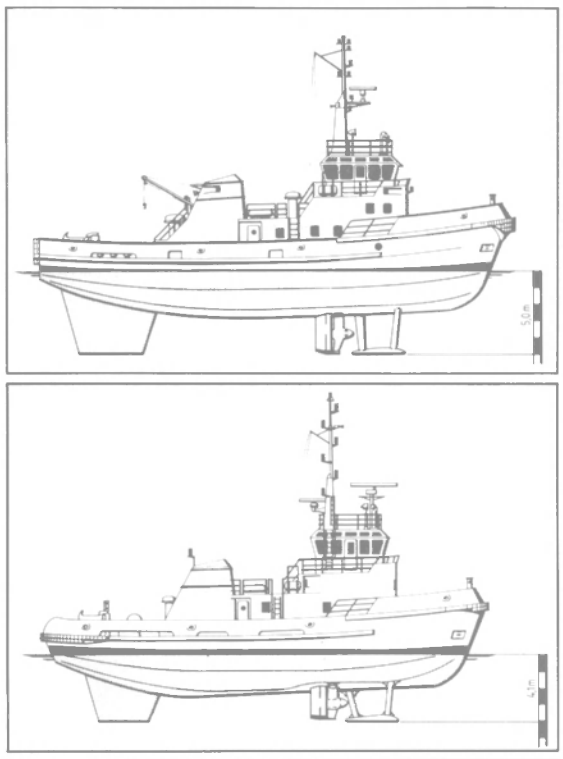
Harvey Trojan
Major Suppliers

Main engines (2)	Stork-Werkspoor
Reduction gears (2)	Reintjes
Engine controls	WABCO
Steering system	Sperry/Vickers
Generator engines (2)	Detroit Diesel
SatNav	Magnavox
Radars (2)	Anritsu
Loran	Furuno
Loran	Texas Instruments
Gyrocompass & autopilot	Sperry
Depth sounder	Simrad
Magnetic compass	Ritchie
SSB radios (2)	Stephens
VHF radios (2)	Sailor
Towing winch	Intercon
Anchor windlass	HBL
Searchlights	Carlisle & Finch
Horn	Kahlenberg

Orders And Deliveries Of Twin-Screw Schottel-Tugs Continue Worldwide

Eleven more twin-screw Schottel-tugs have been ordered and/or delivered to various owners in different countries during the past few months. All of these tractor tugs will be equipped with a twin installation of the versatile Schottel Rudderpropellers for combined propulsion and steering.

The tractor tugs Piet Aucamp and Bart Crove were built by Dorbyl Marine Ltd. of Durban, South Africa, for South African Transport Services of Johannesburg. These 106.6-foot vessels are powered by twin MaK 6M332 diesels, each rated 1,224 bhp at 900 rpm.



Twin-screw Schottel Tugs with Rudderpropellers mounted forward—forward recessed into the hull—and at the stern of the vessel.

Two units for Taiwan are owned by Taichung Harbour Board and built by Taiwan Machinery Manufacturing Corporation. Their propulsion machinery comprises two Stork-Werkspoor SWD 8FHD240 diesels, each with an output of 1,700 bhp at 1,000 rpm.

Two Schottel-tugs for Turkey were built by Marmara Transport A.S. of Istanbul for Turkish Petroleum Corporation of Izmir. They are propelled by two MaK 6M282 engines, each rated 1,360 bhp at 1,000 rpm. Yokohama Yacht Company in Japan built two tugs for Arabian Gulf Mechanical Services and Control Company of Safat/Kuwait. These 92-foot vessels are powered by twin Yanmar T260ST diesels, each with an output of 1,250 bhp at 750 rmp.

Red Funnel Group of Southampton, U.K., ordered two tractor tugs from McTay Marine Limited of Merseyside. With a length of 91 feet, they are powered by twin Stork-Werkspoor 6FHD240 engines.

The stern-driven Schottel-tug Ferdinand Verbiest was built by Scheepswerf Jonker & Stans NV in the Netherlands for Scheldt Towage Company of Antwerp, Belgium. This 101-foot vessel is powered by two Deutz S/BV 6M628 diesels, each rated 1,360 bhp at 1,000 rpm.

As mentioned earlier, all of these tugs are equipped with two Schottel Rudderpropellers as combined propulsion and steering units. These units can be mounted either forward or at the stern of the vessel, depending on the operational area and the permissible draft.

In the case of forward installation, the units can also be recessed into the hull to reduce draft. In deep-water operational areas, the forward-drive Schottel-tugs have proved their excellent ability over many years. The vessels are extremely stable in the water due to the forward mounting of the Rudderpropeller with its protection plate, and are easily maneuvered even in heavy seas. The combination of the forward-mounted propellers with the towing hook near the stern produces very positive stability, eliminating the danger of capsizing.

For further information on Schottel-tugs and Rudderpropellers.,

Circle 25 on Reader Service Card

Meco's "Targa" Technology Boosts Water Maker Efficiency —Literature Available

A new generation of vapor compression water makers, equipped with a patented feedwater treatment system called Targa that is said to cut operating costs by up to 30 percent, has been introduced by Mechanical Equipment Company, Inc. (MECO) of New Orleans.

The new Targa technology involves mixing a portion of the vent gases with boiling salt water that has been treated with an alkaline scale inhibitor. This allows vapor compression units, which have traditionally operated economically, to operate even more efficiently and reliably for extended periods without significant scale buildup.

By comparison, a standard vapor compression unit not equipped with the Targa system and operating at 100 percent capacity would require cleaning and descaling an average of every 25 operating hours. A Targa-equipped unit will go an average 500 hours between cleanings.

Targa-equipped units from MECO are already being used with great success on offshore and onshore petroleum industry rigs and platforms, in power plants and water utilities, on island resorts and remote construction sites, and in new U.S. Navy and Coast Guard vessels.

For further information and free literature on the Targa system,

Circle 27 on Reader Service Card

New Method Of Inspection Used By Pacific Marine Is Cost-Effective —Literature Available

Trained inspection divers from Pacific Marine Services, Terminal Island, Calif., recently performed an internal tank inspection for the American Bureau of Shipping Close-up Survey for Special Survey #3 for Hull using a helmet-mounted video camera and lighting. The new method of inspection, which took place on the M/V Overseas Boston in Long Beach Harbor, Long Beach, Calif., allowed a single diver to perform video and gauging operations simultaneously.

Using purpose-built video and ultrasonic equipment which both recorded and transmitted data to topside personnel, an ABS surveyor was able to witness and approve the inspection. Documentation was done by video taping to record both wall thickness gaugings and close-up visual survey. Data was also recorded by a topside inspection engineer, and tank drawings were used to track the diver through the tanks and record locations of gaugings.

This innovative method of inspection is said to be very cost-effective because the ship's schedule is not interrupted and tank scaffolding or floating during the shipyard period is avoided.

For free literature on Pacific Marine Services inspection services,

Circle 24 on Reader Service Card

FOR MORE INFORMATION
ON
EQUIPMENT AND SERVICES ADVERTISED IN THIS ISSUE

CIRCLE THE APPROPRIATE NUMBER ON READER SERVICE CARD OPPOSITE

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MHI Develops Energy-Saving Marine Super Turbo Generating System

Mitsubishi Heavy Industries, Ltd. (MHI) recently started marketing a power generating system for vessels "Mitsubishi Super Turbo Generating System" designed to meet all power demands on board during navigation by effectively using exhaust gases and heat from a main diesel engine.

Owing to the adoption of the high-performance "MET-SC" turbocharger which has the same efficiency as the conventional one while using less exhaust gas, it became possible to utilize the surplus exhaust gas to run the radial type gas turbine directly for power generation. Along with power generated by using the exhaust gas economizer waste heat recovery system, the new system can produce more power.

The new system can generate 40 to 60 per cent more power and can cut ships' fuel costs by 2 to 3 per cent when compared to the "Hot-Water Flash Power Generating Plant" which has been so far the most efficient waste heat recovery system at MHI.

Thanks to its increased generating capacity, the Mitsubishi Super Turbo Generating System can supply all electricity demands on board for normal navigation without a diesel engine driven electric generator or an auxiliary boiler backup even when the main engine is running at 55 to 60 per cent of maximum capacity. When surplus electricity is generated, the new system can use its shaft generator as an electric motor to return that surplus electricity to the main shaft as propulsive force. Moreover, the Mitsubishi Super Turbo Generating System requires no restricted space in the engine room, facilitating installation.

MHI developed the D-MAP MARK II, an energy-saving power generating system that recovers the engine's waste heat in steam form, in 1981 and the marine hot-water flash generating plant with 50 to 70 per cent higher generating capacity in 1983.

The latest system is based on these generating systems which have been mounted on numerous vessels. The Mitsubishi Super Turbo Generating System will be mounted on a 258,000-deadweight-ton tanker to be built by MHI for Tokyo Tanker Co., Ltd. MHI expects the epochal new generating system to be used by various ships requiring energy saving.

For further information,

Circle 28 on Reader Service Card

Report Shows Amerlock 400 To Be Cost-Effective Maintenance And Repair Coating

A recently published report, "High Solid Systems for Industrial Maintenance and Repair: Technical and Economic Analysis," adds support as to why Amerlock 400 has so quickly established itself as one of the world's leading M&R coatings. Amerlock 400 has achieved a remarkable record of acceptance in virtually every industrial environment since its introduction in 1983.

According to the manufacturer, 75 percent of the companies who have tried it order it again. In sharp contrast to conventional coatings systems which require rigorous surface preparation and multicoats for short-term protection, Amerlock 400 can be applied to minimally prepared surfaces, including intact old paint and tightly adhering rust in one easy-to-apply coating.

Amerlock 400 is a self-priming topcoat which provides extended-term protection and is available in a broad spectrum of Rapid Response Colors. A simple tint of a premanufactured base provides as few or as many gallons as needed.

According to Dr. **Raymond Foscante**, technical director of the Ameron Protective Coatings Division, "Years of Ameron research and development have culminated in the Amerlock concept whereby the advantages of epoxy resin chemistry have been realized in a coating composition which facilitates one-coat, high-build applications."

To obtain a full-color brochure and the report reprint, "High Solids Systems for Industrial Maintenance and Repair: Technical and Economic Analysis,"

Circle 30 on Reader Service Card

Markey Delivers Two Towing Winches for Halter-Built Otto Candies Offshore Tugs

Markey Machinery Company, Inc. of Seattle, designer and manufacturer of custom marine deck equipment, recently delivered two Type TDSDS-36 towing winches for two 140-foot, triple-screw tugs built by Halter Marine of New Orleans for Otto Candies, Inc. of Des Allemandes, La.

Designed for towing and anchor-handling service in deepwater oil exploration applications, each winch has a new weight (less diesel engine) of 110,700 pounds, and a line capacity of 2,880 feet of 2¼-inch wire rope per drum.

This versatile TDSDS-36 winch has two rope drums and one warping gypsy driven by a Detroit 8V-92 diesel engine through a torque converter. The unit also has hydraulic standby drive, automatic spooling, and an Eaton water-cooled retarder for control of anchor lowering.

For more information and free literature on the Markey product lines,

Circle 32 on Reader Service Card

National Fluid's Multiple Intake Selector Allows Unattended, Automatic Pumping —Literature Available

National Fluid Separators, Inc., St. Louis, Mo., have introduced the multiple intake selector (photo) which allows unattended, automatic pumping of several compartments or sumps. Designed as companion product for the Bilgemaster Oily/Water Separator, it is now available for use with other automatic separator systems.

The multiple intake selector allows assignment of a priority to one compartment, such as the engine room, insuring that the priority compartment is clear at all times, before pumping other compartments requiring attention.

For additional information and literature,

Circle 29 on Reader Service Card

BUYERS DIRECTORY

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 20 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) 477-6700.**

AIR COMPRESSORS
Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
Squire-Cogswell Company, 3411 Commercial Ave., Northbrook, IL 60062

AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
Flakt AB, Box 8862, S-40272, Gothenburg, Sweden
Stal Refrigeration AB, Butangsgatan 16, S 601 87 Norrkoping, Sweden
Carrier Transicold Division, Carrier Corp., P. O. Box 4805, Syracuse, NY 13221

ANCHORS AND CHAIN
Baldt Incorporated, P.O. Box 350, Chester, PA 19016
G.J. Wortelboer Jr. B.V., Eemhavenstraat 4, P.O. Box 5003, 3008 AA Rotterdam, Netherlands

ANODES—Cathodic Protection
American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
Engelhard Industries Division, 2655 U.S. Route 22, Union, NJ 07083
Federal Harco, P.O. Box 40310, Houston, TX 77240
Wilson, Walton International, Inc., 66 Hudson St., Hoboken, NJ 07030

BALLASTS
Genstar Stone Products Co., Executive Plaza IV Hunt Valley, MD 21031

BASKET STRAINERS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

BEARINGS—Rubber, Metallic, Non-Metallic
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, OH 44309
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470
Thomson-Gordon Limited, 3225 Mainway, Burlington, Ontario, Canada L7M 1A6
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186

BLASTING—Cleaning—Equipment
Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223-9989
Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England
E.I. DuPont De Nemours & Co., Inc., Starblast Division, Room X39186, Wilmington, DE 19898
Inventive Machine Corp., P.O. Box 369, Bolivar, OH 44612
Key Houston Division of Jacksonville Shipyards, 13911 Atlantic Blvd., Jacksonville, FL 32225

BOILERS
Combustion Engineering, Inc., 1000 Prospect Hill Road, Windsor, CT 06095
Industrial Engineering & Equipment Co., 425 Hanley Industrial Ct., St. Louis, MO 63144
Boiler Tube Company of America, P.O. Drawer 517, Lyman, SC 29365
Murray Tube Works, P.O. Drawer 517, Lyman, SC 29365
Senior Green Economizers, P.O. Drawer 517, Lyman, SC 29365

BOILER CLEANING
Asea Stal, 50 Chestnut Ridge Rd., Montvail N.J. 07645

BROKERS
Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, LA 70153
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Mowbray's Tug & Barge, 21 West St., New York, NY 10006
Western Maritime, 701 B Street, San Diego, CA 92101

BRONZES—COMMEMORATIVE
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

BUNKERING SERVICE
Belcher Company, Inc., 8700 West Flagler, P.O. Box 525500, Miami, FL 33152
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
National Marine Service Inc. (Transport Div.), 1750 Brentwood Blvd., St. Louis, MO 63144

CARGO HANDLING EQUIPMENT
MacGregor-Navire International, Box 8991, S-402 74 Goteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016

CASTINGS/FORGINGS
NKS Industria Pesada, Grupo Industrial, Reforma 404, 140 Piso, Mexico, D.F. 06600 U.S. REP.—Lexington Transport (New York) Inc., 551 Fifth Ave., Room 910, New York N.Y. 10017

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

CLOSURES—Marine
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

COMPUTERIZED INFORMATION SYSTEMS
Marine Management Systems, Inc., 102 Hamilton Ave., Stamford, CT 06902
Maritime Data Network, Ltd., 102 Hamilton Ave., Stamford, CT 06902
Military Contract Information Service, Inc. Dist. by Maritime Reporter/Engineering News, 118 East 25 St. N.Y. N.Y. 10010
TIMSCO, 622 Azalea Rd., Mobile, AL 36609
Veson Systems, 29 Broadway, Suite 1002, New York, NY 10006

CONDENSERS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

CONTROL SYSTEMS—Monitoring
American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
ASEA, Inc., 4 New King St., White Plains, NY 10604
Barringer Research, 304 Carlingview Dr., Rexdale, Ontario, Canada M9W 5G2
Biospherics Inc., 4928 Wyaconda Rd., Rockville, MD 20852
Cooper Energy Services, Mount Vernon, OH 43050
Ergon, Inc., P.O. Drawer 1639, Jackson, MS 39205
Failsafe Motor/Generator Protector, Marine Safe Electronics Ltd., 101 Jardin Dr., Unit 24/25, Concord, Ontario, Canada L4K 1B6
Indikon Corp., 26 New St., Cambridge, MA 02138
Kongsberg North America Inc., 400 Oser Ave., Hauppauge, NY 11738
Leslie Co., 401 Jefferson Rd., Parsippany, NJ 07054
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
Marine Safe Electronics, 37 Staffern Drive, Concord, Ontario, Canada, L4K 2X2
Pandel Instruments Inc., 2100 N. Hwy. 360, Grand Praire, TX 75050
Propulsion Systems, Inc., 21213 76 Ave., Kent, WA 98032
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Thomas Products Ltd., Flow Switch Div., 987 West St., Southington, CT 06489 1023
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062
Valmet Automation A.S., P.O. Box 130, N-3430, Spikkestad, Norway

COUPLINGS
CamLock Flange Sales Corp./Marine Moisture Control Co., 60 Inip Dr., Inwood, N.Y 11696

CRANE BUMPERS
Kastalon Inc., 4101 West 123rd St., Alsip, IL 60658

CRANES—HOISTS—DERRICKS—WHIRLEYS
Allied Marine Crane, P.O. Box 23026, Portland, OR 97233
Appleton Marine, P.O. Box 2339, Appleton, WI 54913
ASEA Hagglunds Inc., P.O. Box 7949, The Woodlands TX 77380
HIAB Cranes & Loaders Inc., 258 Quigley Boulevard, New Castle, DE 19720
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
J.D. Neuhaus, Hebezeuge, D5810, Witten Heven, West Germany
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202

DECK MACHINERY—Cargo Handling Equipment
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, WA 98134
Schoellhorn Albrecht, Div. of St. Louis Ship, 3460 So. Broadway, St. Louis, MO 63118

DECKING—GRATING
Alligned Fiber Composites, Highway 52, South Chatfield, MN 55923
International Grating, 7625 Parkhurst, Houston, TX 77028
Selby, Battersby & Company, 5220 Whiby Ave., Philadelphia, PA 19143

DIESEL ACCESSORIES—CYLINDER LINERS
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
General Thermodynamics Corporation, 210 South Meadow Rood, P.O. Box 1105, Plymouth, MA 02360
Haynes Corporation, P.O. Box 179, Jackson, MI 49204
Illman Jones, 1111 Green Island Rd., American Canyon, CA 94589
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Transamerica Delaval Engine & Comp. Div., 550 85th, Oakland, CA

DIESEL ENGINE—Spare Parts & Repair
Alban Engine Power, Inc., 6455 Washington Blvd., Baltimore, MD 21227
Alco Power Inc., 100 Orchard St., Auburn, N.Y. 13021
Caterpiller Tractor Co. 100 N.E. Adams Street, Peoria, IL 61629-2325
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Cummins Engine Co., Inc., Mail Code 40642, Box 3005 Columbus, IN 47202-3005
Granges Repair Service GMBH, Gutenbergring, 64 D-2000 Hamburg-Norderstedt TX:0215553
Schoonmaker Service Parts Co., Inc., P.O. Box 757, Foot of Spring St., Sausalito, CA 94966
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166
Transamerica Delaval Engine & Comp. Div., 550 85th, Oakland, CA
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647

ELECTRICAL EQUIPMENT
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Newmar, P.O. Box 1306, Newport Beach, CA 92663
Sigmaform Corporation, P.O. Box 515, Richboro, PA 18954
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Ward Leonard Electric Co., 31 South St., Mt. Vernon, NY 10550
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

ELECTRONIC SYSTEMS
Marine Electric RPD, Inc., 666 Pacific St., Brooklyn, NY 11217 TX: 125327

EMULSIFICATION SYSTEMS
Cleanodan A/S, N. American Agents, American United Marine Corp., 5 Broadway, Route 1, Saugus, MA 01906
S/S Research & Development Inc., 1050 State St., Perth Amboy, NJ 08862
Todd Marine Systems, 61 Taylor Reed Place, Stamford, CT 06906

ENGINE TEST EQUIPMENT
General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Road, Plymouth, MA 02360

EQUIPMENT—Marine
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94083
ASEA Hagglunds Inc., P.O. Box 7949, The Woodlands TX 77380
Band-It Division, Houdaille Industries, Inc., P.O. Box 16307, Denver, CO 80216
Beaver Tool Co., 1525 SE 29th St., Box 94717, Oklahoma City, OK 73143
Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Thomas Coudon Associates, 6655 Amberton Dr., Baltimore, MD 21227
Fitz-Wright Suits Ltd., 17919 Roan Pl., Surrey, B.C., Canada V3S 5K1
Genstar Stone Products Co., Executive Plaza IV, Hunt Valley, MD 21031
Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, NY 10550
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302
Raytheon Service Co., 100 Roesler Rd., Suite 103, Glen Burnie, MD
Republic-Lagun Machine Tool Co., 1000 E. Carson St., Carson, CA 90749
Viking Life Saving Equipment, 3305 N.W. 37th Street, Miami, FL 33142
Waterman Supply Co., Inc., 2815 E. Anaheim Street, P.O. Box 596, Wilmington, CA 90748

EVAPORATORS
Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Aqua-Chem Inc., P.O. Box 421, Milwaukee, WI 53201
Atlas-Danmark Marine & Offshore, Baltorpvej 154, KD-2750 Bllerup, Copenhagen DENMARK
Meco (Mechanical Equipment Co., Inc.), 861 Carondelet Street, New Orleans, LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

FANS—VENTILATORS—BLOWERS
American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
Hartzell Fan Company, 901 Downing Street, Piqua, OH 45356
Joy Manufacturing Company, 338 So. Broadway, New Philadelphia, OH 44663
Jon M. Liss Associates, Inc., 411 Borel Ave., P. O. Box 5554, San Mateo, CA 94402

FASTENERS
Hardware Specialty Co., Ships Division, 48-75 36th St., Long Island City, NY 11101
Sales Systems Limited,7006, 700 Florida Ave., Portsmouth, VA 23707

FENDERING SYSTEMS—Dock & Vessel
InterTrade Industries, 15301 Transistor Lane, Huntington Beach, CA 92649
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Seaward International, Inc., 6269 Leesburg Ave., Falls Church, VA 22044

FILTERS
Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307

FINANCING—Leasing
Gulf Western Leasing Corp., 1500 City West Blvd., Suite 300, Houston, TX 77047
JMJ Marine Investors, P.O. Box 51509, New Orleans, LA 70151

FIRE PROTECTION, DETECTION & ALARM SYSTEMS
Walter Kidde, Walter Kidde Dr., Wake Forest, NC 27586

FUEL OIL/ADDITIVES—Analysis & Combustion Testing
Ferrous Corporation, 910 108th N.E., P.O. Box 1764, Bellevue, WA 98009
Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
McTigue Industries Inc., 1615 9th Ave., Bohemia, NY 11716

FURNITURE
Bailey Carpenter & Insulation Co., 74 Sullivan Street, Brooklyn, NY 11231
Comfort-Mate, Inc., 7988 NW 56th Street, Miami, FL 33166

GALLEY EQUIPMENT
Insinger Machine Co., 6245 State Rd., Philadelphia, PA 19135

GANGWAYS
Rampmaster Inc., 9825 Osceola Blvd., Vero Beach, FL 32960

HATCH & DECK COVERS—Chain Pipe
CamLock Flange Sales Corp./Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
MacGregor-Navire Internatinal, Box 8991, S-402 74 Goteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

GAUGES
Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062

HEAT EXCHANGERS
Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Industrial Engineering & Equipment Co., 425 Hanley Industrial Ct., St. Louis, MO 63144
Meco (Mechanical Equipment Co., Inc.), 861 Carondelet Street, New Orleans, LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

HOLD LINERS
Himont U.S.A., Inc., 1313 N. Market St., Wilmington, DE 19894

HULL CLEANING
Aurand 1270 Ellis Street, Cincinnati, OH 45223
Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223-9989
Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England
Petroferm Marine, Route 2, Box 280, Amelia Island, FL 32034
Phosmarine Equipment, 21 Bd. de Paris, 13002, Marseille, France
Seaward Marine Services, Inc., 6269 Leesburg Pike, Falls Church, VA 22044
Seaward International, 5409 Beamon Rd., Norfolk, VA 23513 TX: 710-881-1182
Taylor Diving & Salvage Co. Inc., 701 Engineers Rd., Belle Chasse, LA 70037

HYDRAULICS
Aeroquip Corp., 1130 Maynard Road, Jackson, MI 49202
Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA. 93116
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Del Gavio Marine Hydraulics Inc., 207 W. Central Ave., Maywood, NJ 07607
Hydra-Dynamics, Inc., 2141 Greenwood Ave., Wilmette, IL 60091
Washington Chain & Supply, Inc., P.O. Box 3646, Seattle, WA 98124

INERT GAS—Generators—Systems
Maritime Protection A/S, N. American Agents, American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906

INSULATION—Cloth, Fiberglass
Bailey, Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
Duracote Corp., 350 North Diamond St., Ravenna, Ohio 44266
Superior Energies, Inc. P.O. Drawer 386, Groves, TX 72619

INSURANCE
Adams & Porter, 510 Bering Dr., Houston, TX 77057-1408
Adams & Porter, 1 World Trade Center, Suite 8433, New York, NY 10048
Wm. Keith Hargrove, Inc., 1300 Post Oak Blvd., Suite 2050, Houston, TX 77056
United States P&I Agency, Inc., 80 Maiden Lane, New York, NY 10038

JOINER—Watertight Doors—Paneling
Advanced Structures Corp., 235 W. Industry Ct., Deer Park, NY 11729
Astech, 3030 S. Red Hill Ave., Santa Ana, CA 92711
Bailey Distributors, Inc., 74 Sullivan St., Brooklyn, NY 11231
Masonite Commercial Division, Dover, OH 44622
Megadoor Inc., 441 Lexington Ave., Suite 903, New York, NY 10017
Walz & Krenzer, Inc., 400 Trabold Road, Rochester, NY 14624

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

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Perko Inc., P.O. Box 6400D, Miami, FL 33164
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209

LINE BLINDS
Stacey/Fetterolf Corp., P.O. Box 103, Skippack, PA 19474

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
A-C Brake Co., 308 E. College St., Louisville, KY
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202
Jered Brown Brothers Inc., 1300 Coolidge, P.O. Box 2006, Troy, MI 48007
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
Rosan, Inc., 2901 West Coast Hwy., Newport Beach, CA 92663

METALS
Bayou Steel Corp., P.O. Box 5000, Laplace, LA 70068

MINING
Rocky Mountain Energy, 10 Longspeake Dr., Box 2000, Broomfield, CO 80020

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

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
ACB Industries, 3400 Camp Street Suite 100, New Orleans, LA 70130
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Highway (Suite 1300), Arlington, VA 22202
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Hydromath Inc., Box 2450, Danby-Pawlet Road, Pawlet, VT 05761
American Systems Engineering Corp., P.O. Box 4265, Virginia Beach, VA 23454
Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, MD 20015
Art Anderson Associates, 148 First St., Bremerton, WA 98310
B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C. Canada V6S 2L2
Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
C.A.C.I., Inc., 1815 No. Fort Myer Dr., Arlington, VA 22209
C.D.I. Marine Co., 5520 Los Santos Way, Suite 600, Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829
Phillips Cartner & Co., Inc., 203 So. Union St., Alexandria, VA 22314
Century Engineering, inc., 32 West Rd., Towson, MD 21204
Childs Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, MA 02026
Crane Consultants Inc., 15301 1st Ave., So. Seattle, WA 98148
C.R. Cushing, 18 Vesey St., New York, NY 10007
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, Inc., 1725 Jefferson Davis Highway, Suite 700, Arlington, VA 22202
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
Capt. R.J. Fearson & Associates, P.O. Box 983, Tampa, FL 33601
Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, NY 11050
Gibbs & Cox, Inc., 119 West 31st Street, New York, NY 10001
John W. Gilbert Associates, Inc., 66 Long Wharf, Boston, MA 02110
The Glosten Associates, Inc., 610 Colman Bldg., 811 First Ave., Seattle, WA 98104
Phillip Gresser Associates, Ltd., 3250 South Ocean Blvd., Palm Beach, FL 33480
Morris Guralnick Associates, Inc., 620 Folsom Street, Suite 300, San Francisco, CA 94107
Hamilton Cornell Associates, Box 188, Snug Harbor Station, Duxbury, MA 02331
J.J. Henry Co., Inc., 40 Exchange Place, New York, NY 10005
Hi-Test Laboratories, Inc., P.O. Box 226, Buckingham C.H., VA 23921
HydroComp, Inc., 10 Cutts Road, P.O. Box 865, Durham, NH 03824
Intramarine, Inc., P.O. Box 53043, Jacksonville, FL 32201
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Jantzen Engineering Co., 6655-H Amberton Drive, Baltimore, MD 21227
James S. Krogen & Co., Inc., 3333 Rice St., Miami, FL 33133
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
John J. McMullen Associates, Inc., 1 World Trade Center, New York, NY 10048
McLear & Harris, Inc., 28 West 44 Street, New York, NY 10036
Fendall Marbury, 1933 Lincoln Drive, Annapolis, MD 21401
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, OH 44114
Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, NY 11746
Marine Technical Associates, Inc., 95 River Rd., Hoboken, NJ 07030
Maritime Design, Inc., 2955 Hartley Rd., Jacksonville, FL 32217
George E. Meese, 194 Acton Rd., Annapolis, MD 21403
R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003
NKF Engineering Assoc., Inc., 8150 Leesburg Pile, Vienna, VA 22202
Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
Nickum & Spaulding Associates, Inc., 2701 First Ave., Seattle, WA 98121
Northern Marine, P.O. Box 1169, Traverse City, MI 49685
Ocean-Oil Internatinal Engineering Corporation, 3019 Mercedes Blvd., New Orleans, LA 70114
PRC Guralnick, 5252 Balboa Ave., San Diego, CA 92117
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, FL 33156
S.L. Petchul, Inc., 1380 S.W. 57th Avenue, Fort Lauderdale, FL 33317
Q.E.D. Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St., San Francisco, CA 94105
Sargent & Herkes Inc., 611 Gravier St., New Orleans, LA 70130
Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, FL 33316
SEACOR Systems Engineering Associates Corp., 19 Perina Blvd., Cherry Hill, NJ 08003 (Publications Division at Cherry Hill location)
STV/Sanders & Thomas, Inc., 1745 Jefferson Davis Hwy., Arlington, VA 22202
Seaworthy Systems, Inc., 28 Main St., Essex Ct. 06426; 17 Battery Place, N.Y. N.Y. 10004, P.O. Box 205, Solomons, MD 20688
Seaworthy Electrical Systems, 17 Battery Pl. N.Y. N.Y. 10004
George G. Sharp, Inc., 100 Church St., New York, NY 10007
Simmons Associates, P.O. Box 760, Sarasota, FL 33578
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
J.F. Stroschein Assaciates, 666 Old Country Rd., Garden City, NY 11530
Richard R. Taubler, Inc., 610 Carriage La., Dover, DE 19901
Thomas Coudon Associates, 6655 Amberton Drive, Baltimore, MD 21227
Timsco, 622 Azalea Road, Mobile, AL 36609
Tracor Hydronautics, Inc., 7210 Pindell School Rd., Laurel, MD 20707
Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744

NAVIGATION & COMMUNICATIONS EQUIPMENT
Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080
British Telecom International, The Holborn Centre, 120 Holborn, London EC1N 2TE
CMC Communications Inc., 5479 Jetport Industrial Blvd., Tampa, FL 33614
COMSAT World Systems, 950 L'Enfant Plaza, S.W., Suite 6151 Washington, DC 20024
A/S Elektrisk Bureau, P.O. Box 98, N-1360 Nesbru, Norway
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
General Electric Company, Mobile Communications Division, Lynchburg, VA 24502
Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610
Henschel Corp., 9 Hoyt Drive, Newburyport, MA 01950
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
ITT Mackay, 441 U.S. Highway #1, Elizabeth, NJ 07202
Japan Radio Co., Ltd., Akasaka Twin Tower, 17-22, Akasaka 2-chome, Minato-ku, Tokyo 107, Japan U.S. Rep: 405 Park Ave., New York, NY 10022
Kongsberg North America Inc., 400 Oser Ave., Hauppauge, NY 11738
Kongsberg Vopenfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway
Krupp Atlas-Elektronik, 1453 Pinewood St., Rahway, NJ 07065
Micrologic, 20801 Dearborn, Chatsworth, CA 91311
Nav-Com, Inc., 9 Brandywine Drive, Deer Park, NY 11729
Navigation Sciences Inc., 6900 Wisconsin Ave., Bethesda, MD 20815 TX: 705999
Perko Inc. (Lights), P.O. Box 6400D, Miami, FL 33164
Racal Marine Inc., 1 Commerce Blvd., Palm Coast, FL 32037-0029
Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033
Raytheon Marine Co., 676 Island Pond Road, Manchester, NH 03103
Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061
Robertson Autopilot, 400 Oser Ave., Happauge, NY 11738
S.P. Radio A/S, DK 9200 Aalorg, Denmark
Sperry Corporation, Great Neck, NY 11020
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Telesystems, 2700 Prosperity Ave., Fairfax, VA 22031 USA
Texas Instruments, Inc., P.O. Box 405, 3438, Lewisville, TX 75067
Tracor Instruments Austin Inc., 6500 Tracor Lane, Austin, TX 78725

OILS—Marine—Additives
Exxon Company, U.S.A., Room 2323 AH, P.O. Box 2180, Houston, TX 77701
Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001
Gulf Oil, New York District Sales Office (Domestic), 433 Hackensack Avenue, Hackensack, NJ 07601
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
Mobil Oil Corp., 150 East 42 Street, New York, NY 10017
Texaco, Inc. (International Marine), 135 East 42nd St., New York, NY 10017

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Biospherics, Inc., 4928 Wyaconda Rd., Rockville, MD 20852
Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223
Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England
Centrica, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307
Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
Hyde Products, Inc., 810 Sharon Dr., Westlake, OH 44148
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
NALCO Chemical, Co., 2901 Butterfield Road, Oak Brook, IL 60521
Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062
Peck Purifier Sales Co., 3724 Cook Blvd., Chesapeake, VA 23323

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American Abrasive Metals, 460 Coit Street, Irvington, NJ 07111
Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754
Dampney Company, Inc., 85 Paris St., Everett, MA 02149
Devoe Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207
Drew Ameroid Marine, One Drew Chemical Plaza, Boonton, NJ 07005
E.I. DuPont De Nemours & Co., Inc. Nemours Bldg., Rm. N-2504-2, Wilmington, DE 19898
DuPont Co. MPS , Room X40750, Wilmington, DE 19898
Esgard, Box 2698, Lafayette, LA 70502
Farboil Company, 8200 Fischer Rd., Baltimore, MD 21222
Hempel Marine Paints, Inc., Foot of Currie Ave., Wallington, NJ 07057; 6868 NorthLoop East, Suite 304, Houston, TX 77028; P.O. Box 10265, New Orleans, LA 70181
International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083
Jaegle Paint Company, Inc., 1012 Darby Road, Havertown, PA 19083
Jotun Marine Coatings Inc., 175 Penrod Court N&O, Glen Burnie, MD 21061
Magnus Maritec International Inc., 150 Roosevelt Pl., P.O. Box 150, Palisades Park, NJ 07650
Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203
Selby Battersby & Co., 5220 Whitby Ave., Philadelphia, PA 19143

PIPE-HOSE—Cargo Transfer Clamps, Couplings, Coatings
Amermarine International, P.O. Box 9205, Dundalk, MD 21222
Deutsch Metal Components, 14800 S. Figueroa St., Gardena, CA 90248
Hydro-Craft Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063
Knights Piping Inc., 5309 Industrial Road, Pascagoula, MS 39567
Tioga Pipe Supply Co. Inc., 2450 Wheatsheaf La., P.O. Box 5997, Philadelphia, PA 19137

PLASTICS—Marine Applications
Hubeva Marine Plastic, Inc., 390 Hamilton Ave., Brooklyn, NY 11231
Norton Chemplast, 309-150 Dey Rd. Wayne NJ 07470

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Amarillo Gear Co., P.O. Box 1789, Amarillo, Texas 79105
Armco Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
Bergen Diesel Inc., 2110-10 Service Rd., Kenner, LA 70062
Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Caterpillar Engine Division, 100 N.E. Adams, Peoria, IL 61629
Colt Industries Inc. (Fairbanks Morse Engine Div.), 701 Lawton Avenue, Beloit, WI 53511
Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520
Combustion Engineering, Inc., Windsor, CT 06095
Coolidge-Stone Vickers, Inc., 56 Squirrel Rd., Auburn Hills, MI 48057
Daihatsu Diesel (USA) Inc., 180 Adams Ave., Hauppauge, NY 11788
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505
George Engine Company, Inc., Lafayette, LA
General Motors, Electro-Motive Division, LaGrange, IL 60525
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231
Isotta Fraschini S.p.A., c/o Italian Aerospace Industries (U.S.A.), Inc., 1235 Jefferson Davis Hwy., Suite 500, Arlington, VA 22202
KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada
Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323
M.A.N.-B&W Diesel, 2 Ostervej, DK-4960 Holeby, Denmark
MTU of North America, One E. Putnam Ave., Greenwich, CT 06830; 10450 Corporate Dr., Sugarland, TX 77478; 2945 Railroad Ave., Morgan City, LA 70203; 180 Nickerson St., Seattle, WA 98109; 1730 Lynn St., Arlington, VA 22209
MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
Mitsubishi Kakoki Kaisha LTD, Mita Kokusai Bldg. 4-28 Mita 1-chome, Minato-ku Tokyo 108 Japan
National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA 70037
North American Marine Jet P.O Box 1232 Benton, AR 72015
Omnithruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
Penske GM Power, Inc., 600 Parsippany Road, Parsippany, NJ 07054
Inland Water Propulsion Systems, Inc., 580 Walnut St., Cincinnati, OH 45201
Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032
SACM (Societe Alsacienne De Constructions Mechaniques De Mulhouse) 1, Rue De La Fonderie, Boite Postale 1210, 68054 Mulhouse Cedex, France
Schottel of America, Inc., 8375 N.W. 56 St., Miami, FL 33166
Skinner Engine, Co., P.O. Box 1149, Erie PA 16512
Stewart & Stevenson Services, Inc., P.O. Box 1637, Houston, TX 77251-1637
Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland
Tech Development Inc., 6800 Poe Ave., P.O. Box 14557, Dayton, OH 45414
Transamerica DeLaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621
Transamerica Delaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, NJ 08650
Ulstein Maritime Ltd., 6307 Laurel St., Burnaby, B.C. Canada V5B 3B3
Ulstein Trading Ltd. A/S, N-6-65, Ulsteinvik, Norway
J.M. Voith GmbH Dept. WErung, Postfach 1940 7920 Heidenheim/Brenz, West Germany
Voith Schneider America, 159 Great Neck Rd., Ste. 200, Great Neck, NY 11021
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
WABCO Fluid Power, an American-Standard Company, 1953 Mercer Rd., Lexington, KY 40505
Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072
Waukesha Engine Division, Waukesha, WI 53187

PUMPS—Repairs—Drives
Allweiler Pump Inc., 5410 Newport Dr., Rolling Meadows, IL 60008 TX: 270-0444
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
Ingersoll—Rand Pump Group, Dept. B—346, Washington, N.J. 07882
Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101
Meco (Mechanical Equipment Co., Inc.), 861 Carondelet Street, New Orleans, LA 70130
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
Sims Pump Valve Co., Inc., 1314 Park Ave., Hoboken, NJ 07030
Transamerica Delaval, Pyramid Pump Div., P.O. Box 447, Monroe, NC 28110
Vita Motivator Company, 200 West 20th St., New York, NY 10011
Warren Pumps Division, Bridges Avenue, Warren, MA 01083
Wilden Pump & Engineering Co., 22060 Van Buren St., P.O. Box 845, Colton, CA 92324

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Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
United Technologies Carrier Transicold Div., Carrier Corp., P.O. Box 4805, Syracuse, NY 13221

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A L. Don Co., Foot of Dock St., Matawan, NJ 07747
Allied Fibers, 1411 Broadway, New York, NY 10018
American Mfg. Co., Inc., Willow Avenue, Honesdale, PA 18431
Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008
DuPont Co., KEVLAR Aramid Fiber, Room G-15465, Wilmington, DE 19898
Tubbs Cordage Company, P.O. Box 709, Orange, CA 92666
Tubbs Cordage Co., P.O. Box 7986, San Francisco, CA 94120-7986
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Golar Metal A/S, P.O. Box 70, 4901 Tvedestrand, Norway
Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
Marine Moisture Control Co., Inc., 60 Inip Dr., Inwood, L.I., NY 11696
Marland Environmental Systems, P.O. Box 501, Great Falls, VA 22066

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McCausey Lumber Co., 7751 Lyndon, Detroit, MI 48238
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Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

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Crane Packing Company, 435 Regina Dr., Clarksberg, MD 20734
EG&G Sealol Engineered Prod. Div. Marine Products Group, Warwick, RI 02888
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SHIPBREAKING—Salvage
Fred Devine Diving & Salvage, Inc., 6211 N. Ensign, Swan Island, Portland OR 97217
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

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Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA 93116
Cockatoo Dockyard Pty. Ltd., P.O. Box 1139, North Sydney, NSW 2060, Australia TX: 72086
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Total Transportation System Inc., 813 Forest Dr., Newport News, VA 23606
Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 248, N 5201, Os, Norway

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Armco Steel Corp., 703 Curtis St., Middletown, OH 45042
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United States Steel Corp., Christy Park Plant, 2214 Walnut St., McKeesport,

PA 15132
Welded Beam Company, P.O. Box 280, Perry, OH 44081

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Asmar Shipyards Co., Astilleros y Maestranzs de la Armada, Prat 856, Piso 14, Casilla 150-V, Valpariso, Chile, S.A.
Astilleros Unidos De Veracruz, S.A. San Juan Ulua S/N, Apdo. Postal 647 Veracruz, Ver Mexico
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
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Blount Marine Corp., P.O. Box 368, Warren, RI 02885
Boston Whaler Commercial Div., 1149 Hingham St., Rockland MA 02370
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Koch Ellis Barge & Ship Service, P.O. Box 9130, Westwego, LA 70094
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Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, WA 98134
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Moran Shipping Agencies, 602 Sawyer, Suite 200, Houston, TX 77077
Moss Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552
National Marine Service (Shipyard Division), P.O. Box 38, Hartford, IL 62048
National Steel & Shipbuilding Corp., San Diego, CA 92112
Nautilus Surveys Inc., 10822 Sageleaf Lane, Houston, TX 77089
Neorion Shipyards Syros Ltd., Syros, Greece–U.S.A. Agents: Keppel Marine Agencies Inc., 26 Broadway, New York, NY 10004, 6420 Richmond Ave., Houston, TX 77057
Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607
Nichols Brothers Boat Builders Inc., P.O. Box 580, 5400 S. Cameron Rd., Freeland, WA 98249
Pennsylvania Shipbuilding, P.O. Box 442, Chester, PA 19016
Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22
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Drew Chemical Corporation, One Drew Chemical Plaza, Boonton, NJ 07005
Everpure, Inc., 660 N. Blackhawk Dr., Westmont, IL 60559
Marine Moisture Control, 60 Inip Dr., Inwood, NY 11696
Marland Environmental Systems, P.O. Box 501, Great Falls, VA 22066
MECO (Mechanical Equipment Company, Inc.), 861 Carondelet St., New Orleans, LA 70130
Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

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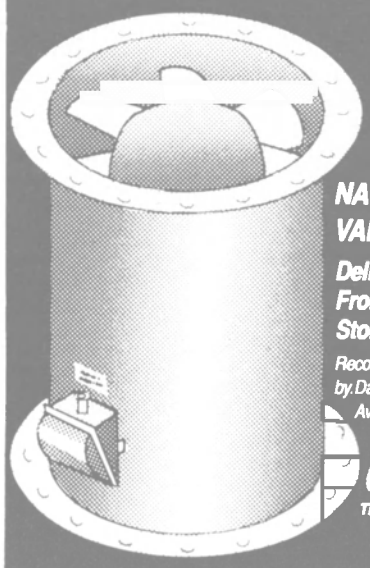

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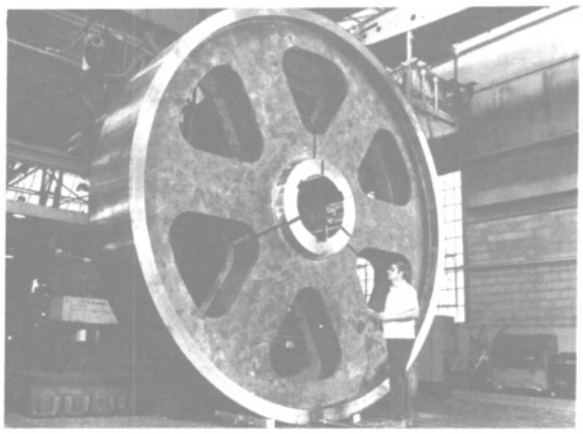
Falk 16-Foot Bull Gear Transmits 12,000 Horsepower —Free Brochure Available



The 65,000-pound main drive gear shown above was designed and fabricated by The Falk Corporation of Milwaukee for a Midwest steel mill. It carries a nominal load of 12,000 hp at 65 rpm, and features cast/weld construction to meet severity of service.

The huge gear, with mating drive shaft, was fabricated, machined, and assembled wholly within Falk's facilities. Weighing more than 25 average-size automobiles, the 100,000-pound assembly was completed and delivered in 17 weeks to meet an urgent need.

For further information and free literature on Falk's product line,

Circle 34 on Reader Service Card

Inventive Machine Introduces Improved Blast/Vacuum Units —Free Literature Available

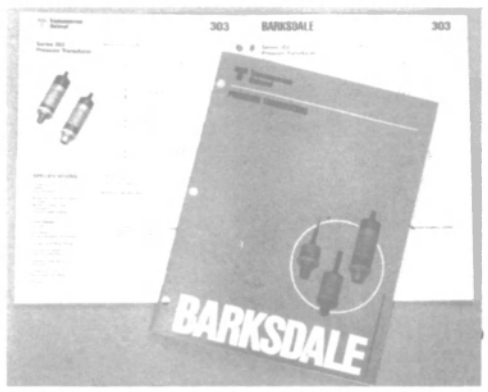
Inventive Machine Corporation's Blast n'Vac pneumatic blasting and recovery system that allows abrasive blasting and vacuum recovery simultaneously now offers three improved packages to meet production needs—BNVP-3, -4, and -5. The working weight of hand held components has been reduced by 50 percent as a result of new urethane hoses and aluminum workheads (photo), providing greater ease of use and flexibility.

The Blast n'Vac system is designed for blasting in sensitive areas that are usually considered too costly, too much trouble, or too hazardous to work in, such as inside tanks, offshore rigs and ships, bridges over waterways, and in high-traffic areas. Due to immediate retrieval of abrasive residue at the blast point, this system eliminates hazardous dust clouds, contamination, and clean-up after blasting. Blast production rates vary according to nozzle size, type of surface to be blasted, coating to be removed, or degree of blast required, but normal in-service rates can range from 60 to 240 square feet per hour.

For more information and free literature on the improved Blast n'Vac system,

Circle 31 on Reader Service Card

Barksdale Controls Presents Line of Pressure Transducers —New Free Brochure Available



A new 24-page catalog from Barksdale Controls Division presents the company's diverse line of semiconductor strain-gauge pressure transducers. Standard models are available with milli-gauge volt, voltage, milliampere and frequency outputs, with gauge pressures from 0-50 to 0-10,000 psig and absolute ranges from 0-50 to 0-300 psia. Other standard design features include full-scale accuracy of $\pm .5\%$ including nonlinearity, hysteresis and repeatability, and thermal effects and sensitivity to a predictable $\pm .02\%/°F$ over a compensated temperature range of +30°F to +130°F. Pressure ports are either $\frac{1}{4}$-18NPT or $\frac{7}{16}$-20UNF.

Individual product presentations include complete performance specifications, materials of construction, all available modifications and options, and ordering information. A tutorial compares strain-gauge pressure transducers with other types. A glossary of transducer terminology and a discussion of transducer applications are also included.

In addition to pressure transducers, Barksdale Controls Division, Transamerica Delaval Inc., is a manufacturer of electromechanical and solid-state temperature controls, pressure/vacuum switches, Shear-Seal® brand directional control valves, high-pressure regulator valves, microprocessor-controlled selector valves, and the industry's only solid-state pressure switch.

For further literature containing full information,

Circle 38 on Reader Service Card

Envirovac Inc. Appoints Environmental Systems Manufacturer's Representative To U.S. Marine Industry

Frank J. Eubank, executive vice president and general manager of Envirovac Inc. of Rockford, Ill., recently announced the appointment of Environmental Systems Inc. (ESI) of Arnold, Md., as a manufacturer's representative to assist in the sale of vacuum sewage systems to the U.S. marine industry (government and commercial).

The principals of ESI have been involved with marine vacuum sewage systems for many years. **G. Sam Sharkins**, president, has spent the last eight years working for ERC and EVAK Vacuum Sewage Systems along with the U.S. Navy Research Lab, in the manufacturing and development of vacuum sewage systems. **Milton Rapuk Jr.** was a civilian engineer at the Navy Research Lab with over 13 years' experience and was instrumental in developing the fire main powered eductor sewage system.

For further literature containing full information,

Circle 69 on Reader Service Card

Limitorque Introduces New Worm Gear Operators For Valve Or Mechanism Control —Technical Literature Available

A new "T" Series worm gear operator for manual and motorized control of any valve or mechanism requiring 90-degree rotation is now available from Limitorque Corporation in Lynchburg, Va.

The new operators are available in two series: a commercial series for general industry applications utilizing ductile iron worm gears; and an AWWA series meeting AWWA C504-80 specifications and incorporating bronze worm gears.

All components in both series feature rugged, high-strength cast iron enclosures; self-locking worm gears with minimum gear backlash; fully O-ringed sealed construction; and external mechanical stops to provide plus or minus travel adjustability. The units are built for outdoor service, are weatherproof, and are permanently lubricated. A wide selection of spur gear attachments and optional accessories, to meet virtually any operating requirement, are also available.

Limitorque is a leading international manufacturer of valve actuators and control systems, with manufacturing facilities, stocking distributors, and sales/service centers nationwide and internationally.

For further literature or free technical literature,

Circle 36 on Reader Service Card

M.A.N.-B&W Diesel Modernizing Concept Reduces Fuel Bill By Approximately 22 Percent

The first conversion using the modernizing concept for a B&W 2-stroke impulse turbocharged diesel engine was performed earlier this year at the Nippon Kokan K.K. in Japan. The conversion was performed on the ore carrier Sensho Maru owned by Showa Line. The conversion package was delivered by Mitsui Engineering & Shipbuilding Co.

The 191,000-dwt Sensho Maru, which was built by Nippon Kokan K.K. in 1976, was propelled by a 10K90GF, which developed maximum power of 34,100 bhp at 114 rpm. According to the owner, as a result of the conversion of the main engine into a 10K90/70MC, the maximum power will now be 19,300 bhp at 94.5 rpm. During the conversion, the propeller was also replaced by one with a larger diameter.

The conversion reduces the ship's service speed from 15.6 to 13 knots. However, as a result of the conversion, the owner will reduce his fuel bill by approximately 22 percent, while maintaining the same ship speed.

For further information concerning the modernizing concept,

Circle 70 on Reader Service Card

ELECTRONICS UPDATE

Electronic Mail Techniques Save Thousands Of Dollars In Message Costs, According To NAV-COM Report

A study recently completed by NAV-COM Incorporated gives conclusive proof of the cost-benefits of using electronic mail for teletype message traffic ship and shore. A typical commercial ship can save $7,000-$11,000 per year in satellite calling charges, according to the NAV-COM analysis, while ships with a high volume of message traffic, such as passenger vessels or offshore oil rigs, can save upwards of $30,000 per year.

These results can be achieved through the use of advanced electronic mail techniques, which convert text digitally into data for transmission at higher speeds via satellite voice channels instead of slower-speed telex channels.

According to company president **Gerald A. Gutman**, NAV-COM has developed an electronic mail facility as a central feature of the BUSISHIP marine management information system. NAV-COM has devised specialized software to give maximum cost effectiveness in using satellite communications for electronic mail by minimizing call connection time.

"Most office-type electronic mail terminals are designed to function with terrestrial telephone networks, in which connection time is not a critical cost factor," said Mr. **Gutman.** "When using the INMARSAT network, however, with calling charges running as high as $10 per minute for telephone service, the length of the call becomes of critical importance." For that reason, NAV-COM's BUSISHIP system uses specialized proprietary software to eliminate wasted time in the transmission. Mr. **Gutman** added that BUSISHIP is the only electronic mail system designed specifically for operation with the INMARSAT satellite network.

Electronic mail messages can be sent between ship and shore in a fraction of the time needed for telex. While telex is transmitted at 50 bits per second, electronic mail is sent at speeds of 1,200-2,400 bits per second—24 to 48 times faster. Since satellite calls are charged by the minute (or fraction of a minute), faster transmission speeds means lower call charges. Although per-minute rates for telex calls are lower than those for telephone service, the difference is more than offset by the faster speed of transmission. Cost savings will accrue even for short telex messages, and especially for longer ones.

NAV-COM's study compared daily and annual costs of telex and electronic mail for various vessel types. The analysis was based on the average daily telex message traffic for each category, as taken from INMARSAT reports. Comparisons were run for three different coast earth stations (U.S., U.K. and Norway) and for different baud rates (1,200 and 2,400 bits per second) for electronic mail transmission. Thus, it was found that a "typical" tanker, for instance, transmits eight minutes of telex per day. This translates into $35.20 per day in telex costs, or $12,848 per year (using the U.S. coast earth stations). At 1,200 bps, the same amount of traffic would cost only $1,825 per year, for an annual savings of $11,023. Similarly, a typical bulker with an average of six minutes per day of telex traffic could save $7,811 per year using electronic mail.

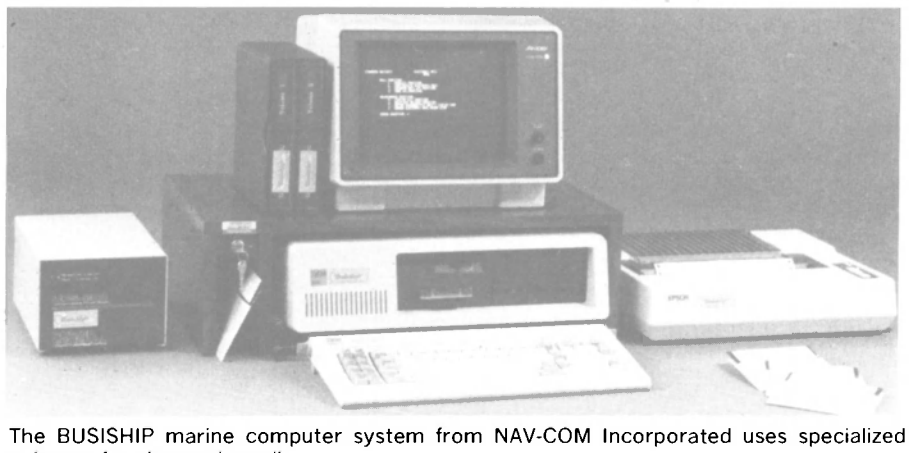
"Our analysis shows that a typical BUSISHIP system will pay for itself in as little as 468 days in message-cost savings alone," said Mr. **Gutman.** "Substantial additional savings can also be achieved through improved operating efficiencies resulting from computerizing such functions as on-board spares inventory and vessel accounting/administration."

"The NAV-COM electronic mail cost-benefit analysis can be applied to any vessel," said Mr. **Gutman.** "All we need to know is the average telex traffic per day, either in minutes or in pages, and we can tell a shipowner exactly how much can be saved."

BUSISHIP is a marine management information system built around the IBM PC/XT and PC/AT personal computers. It includes a total package of "ruggedized" hardware and specialized software for shipboard applications. The system has been structured so as to encourage standardized reporting procedures among all ships in a fleet, giving improved efficiency in exchanging vital management information between ship and shore.

For further information,

Circle 18 on Reader Service Card



The BUSISHIP marine computer system from NAV-COM Incorporated uses specialized software for electronic mail.

A New 12-Inch Radar From Krupp Atlas Elektronik

A new 12-inch AC/TM rasterscan radar designed for either stand-alone or integrated installation aboard all types of small civil, naval and fishing vessels, the Atlas 5600, has been introduced by Krupp Atlas Elektronik.

Combining continuous radar presentation and dedicated data display functions on a single 44-cm high-resolution screen, the system offers one or more viewers uninterrupted true daylight viewing of a quality superior to a conventional TV picture. Data areas indicated include status of selected operational mode and adjustments, marker positions, own ship's data, target data, alarms and failure diagnosis together with other key functions selectable via an integral membrane keyboard and associated menu control; marker positioning is by roller ball.

The system also incorporates a new centered TM display mode that eliminates disadvantages of true motion presentation by maintaining own ship's position fixed on PPI while indicating moving targets with their true trails. Adjustable lengths of target trails may be additionally generated for rapid orientation to given traffic situations.

Other main functions include manual acquisition of up to 10 targets and semiautomatic plotting with target data readout, including CPA and TCPA. An EMB-positioned navigation line and a trail maneuver facility for rapid prediction and assessment of surrounding traffic conditions are among other features, which also include comprehensive self-check procedures in addition to flexible interacing arrangements for other navigational sensors and processing systems.

The new Atlas 5600 AC/TM rasterscan radar designed for all classes of small ships, including fishing vessels.

Designed to comply with, or exceed IMO, USCG, DoT, DHI and other leading performance specifications, the 5600 operates over a series of nine ranges extending from 0.3 to 72 nm. Available with either X or S-band transceiver/slotted array antennae, units can be interswitched for cross-connection and master/slave operation.

The development of the 12-inch 5600 follows the recent introduction of the Atlas 7600-86—series of radars, which are said to be the first of their type to offer continuous true daylight viewing on a 16-inch screen. With FCC, DoT and DHI type-approval among others, nearly 200 of these systems have already been sold worldwide.

For further literature containing full information,

Circle 16 on Reader Service Card

Uniden To Introduce Six New Marine Radio Models At IMTEC Show In Chicago —Literature Available

Uniden Corporation of America, Marine Communications Division, Indianapolis, Ind., will feature its 90-channel, remote control marine radio, the MC 900, as well as five other new units, at the IMTEC Show in Chicago, September 27-30 this year.

"Because of its two-piece design and compactness, the MC 900 is extraordinarily easy to use," says **George Rabatin,** Uniden's national sales manager of marine products. "The control head is compact enough to fit virtually anywhere it is needed, and the power unit can be stowed in any location up to 18 feet away," he states.

The MC 900's channel coverage includes all U.S., international, and weather channels. It has full 90-channel scanning capability and features automatic monitoring of Channel 16 for safety information. The fully programmable unit is touch-controlled through a flat, water-resistant keypad and its power is switchable from one to 25 watts.

The five other new radio units that Uniden is unveiling at the show are the MC 990, MC 790, MC 690, MC 500, and MC 310.

Two other new products on display will be the Uniden MC 500 video fish-finder and the MC 310 digital speed unit that is compatible with the company's MC 300 digital depth unit.

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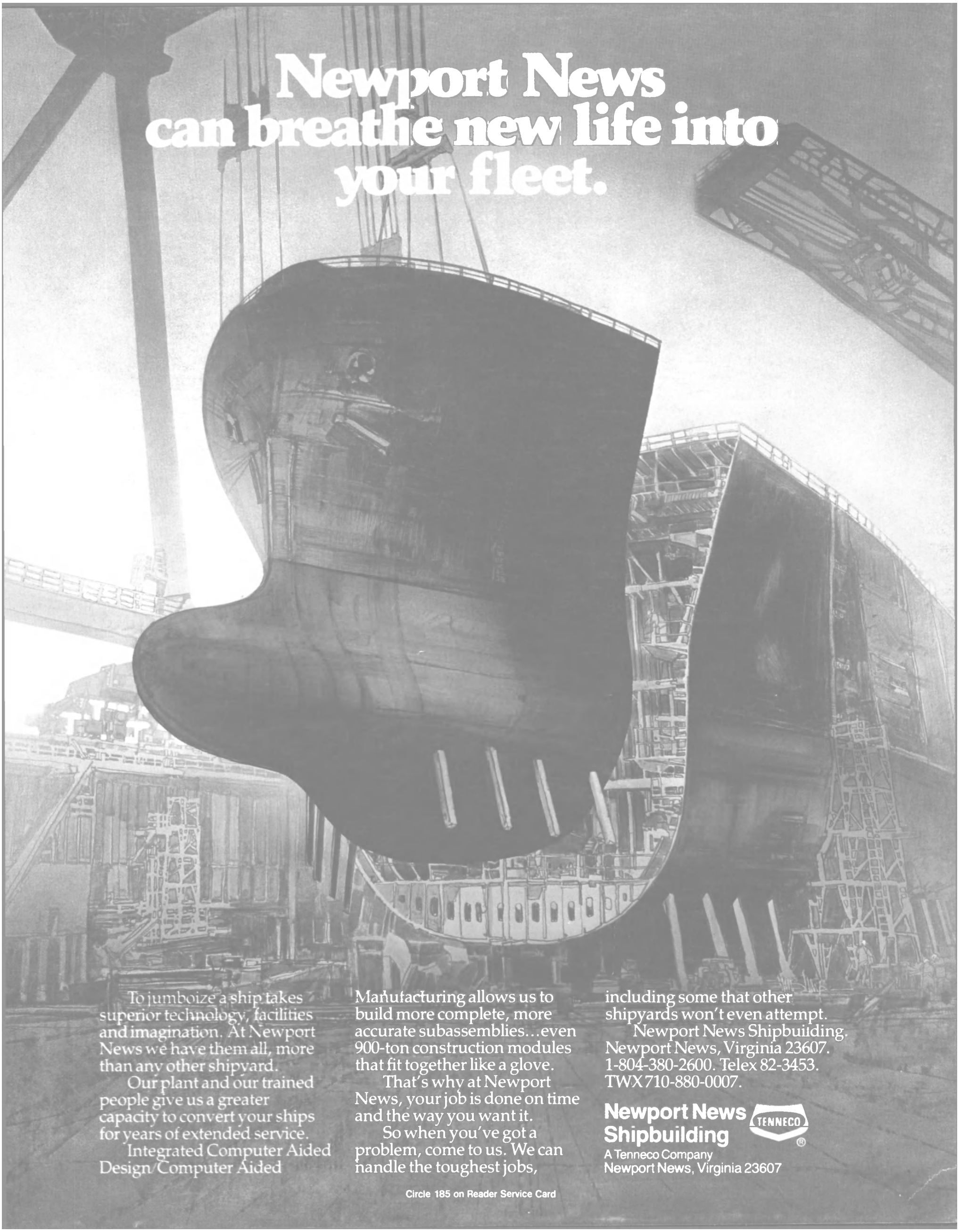

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