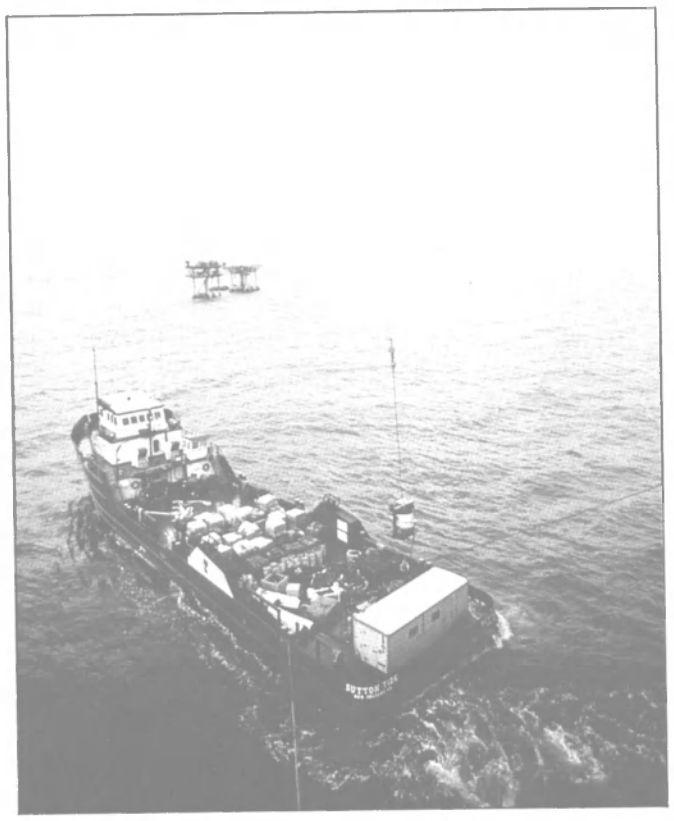
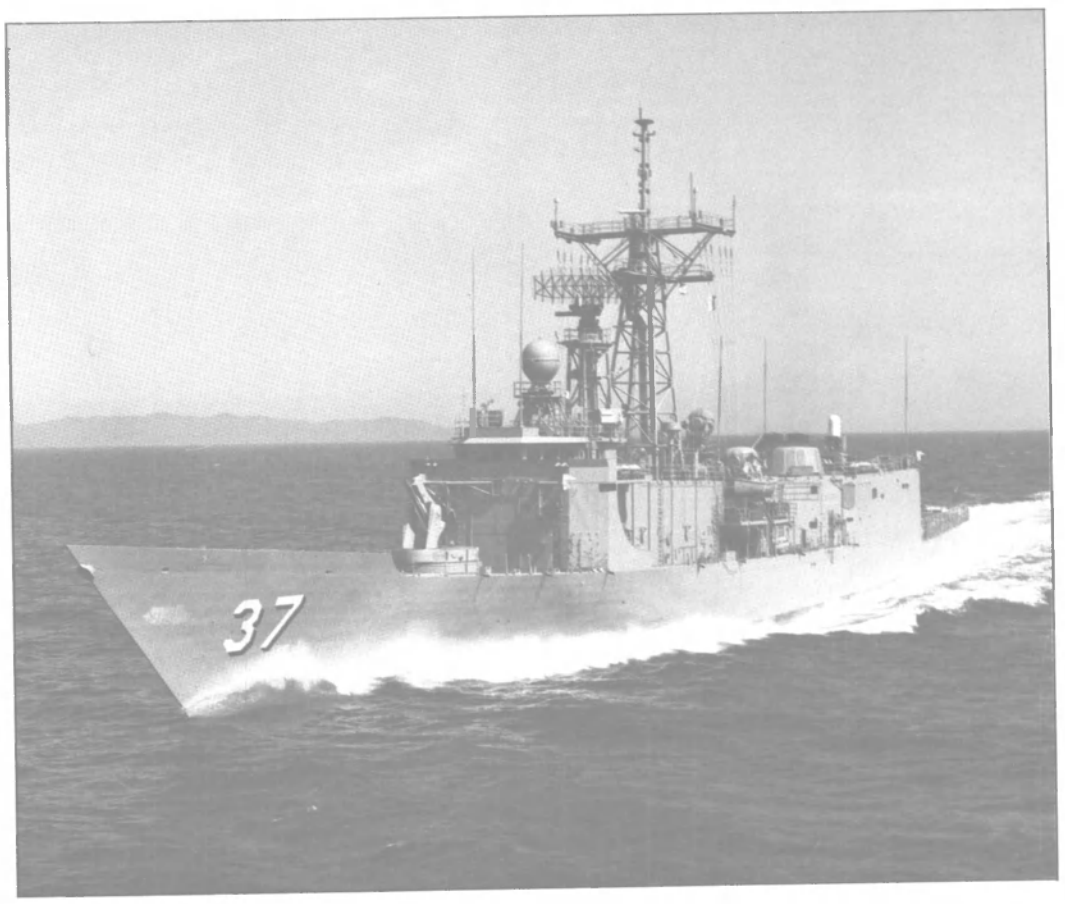
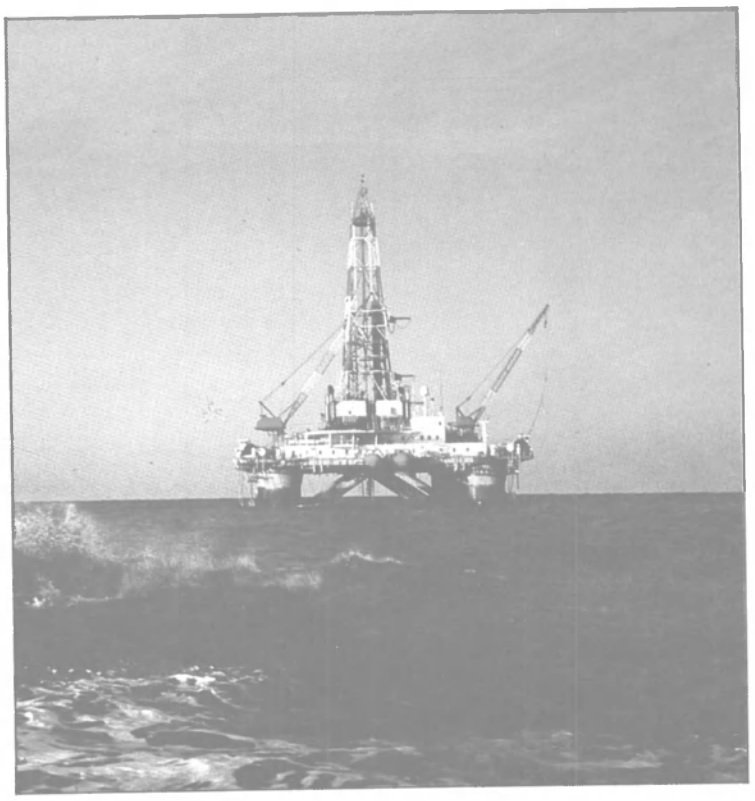
MARITIME REPORTER
AND ENGINEERING NEWS





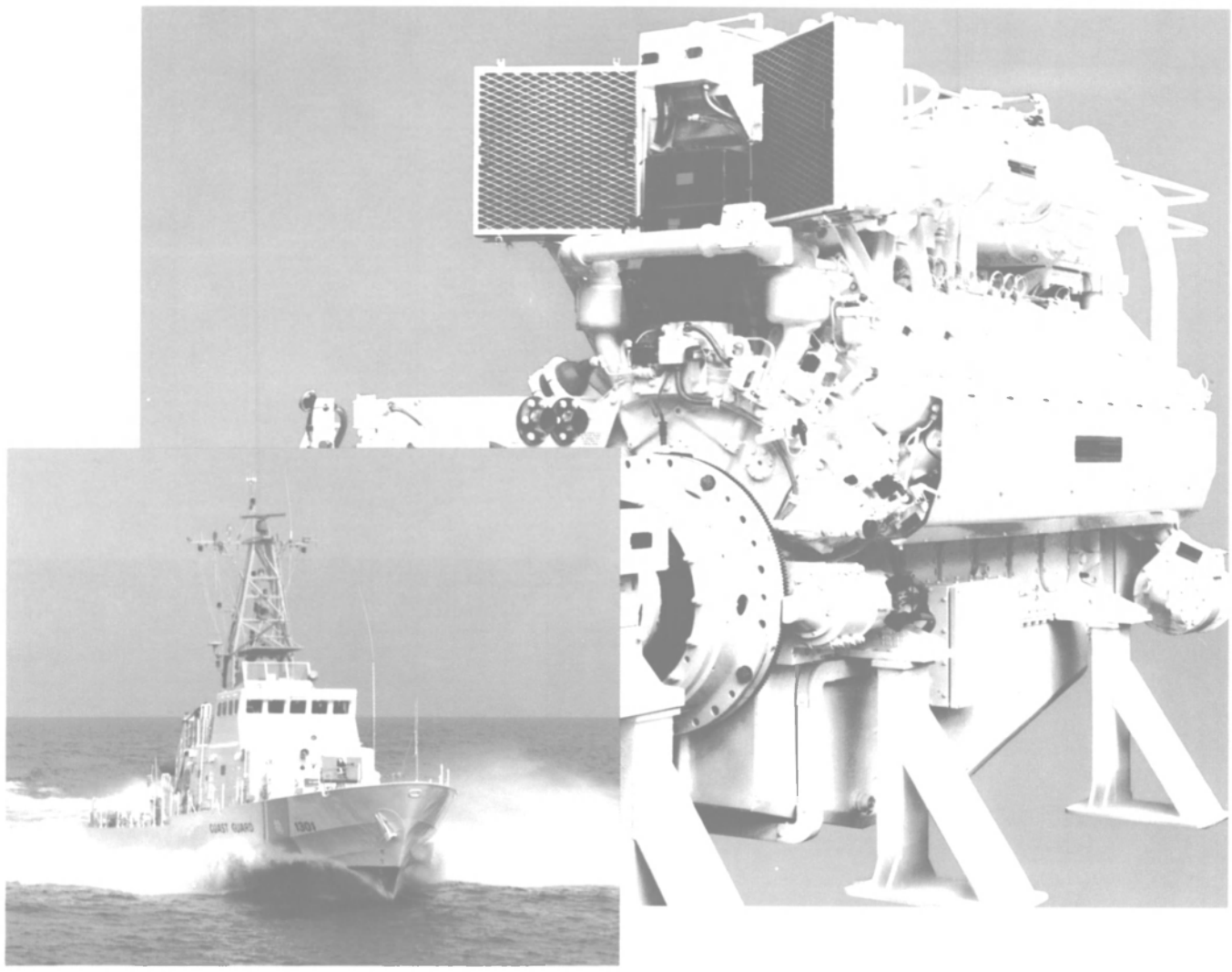


ASNE DAY • OTC '86

APRIL 1986 ISSUE

PAXMAN VALENTA

Propulsion Power for United States Coast Guard "Island Class" Patrol Boats



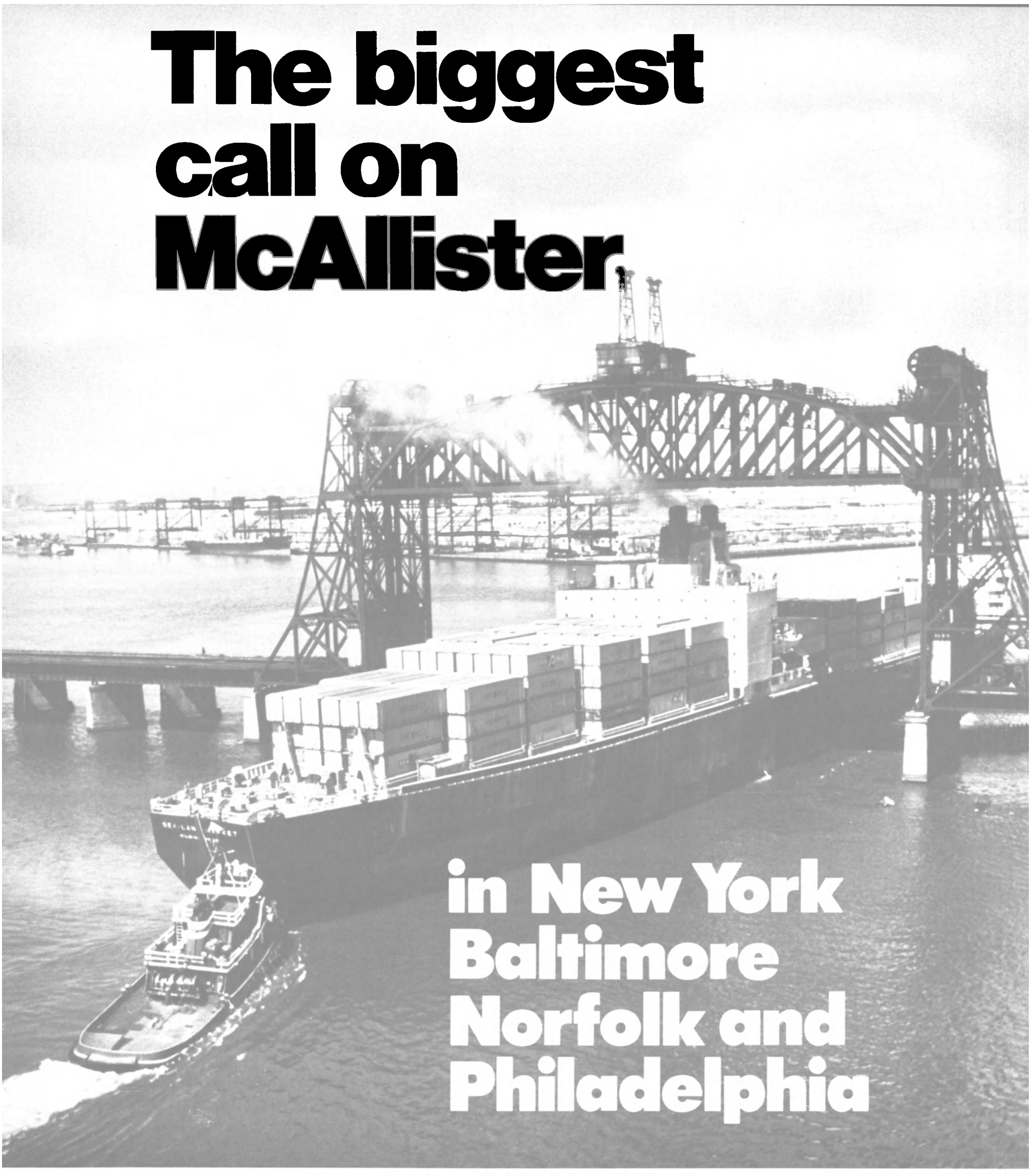
Paxman Valenta – A high-technology engine for America's newest class of patrol boats. Compact, light and powerful, it is also a rugged, shock-proof, and combat-proven engine.

Full logistic support – services, spares and training – provided within the U.S.A. by ALCO.

ALCO's illustrious history includes many years of such support services to the United States Military and we at ALCO are proud to extend this support to the Paxman Valenta.

ALCO Power Inc.
100 Orchard St.
Auburn, NY 13021
Phone: (315) 253-3241
Telex: 6854528 ALCO ABUR

ALCO Power Inc.
9380D Forestwood Lane
Manassas, VA 22110
Phone: (703) 369-6665
Telex: 6711482 ALCO UW



Circle 250 on Reader Service Card

McAllister Brothers, Inc. Towing and transportation. 17 Battery Place, **New York, N. Y.** 10004. (212) 269-3200. **Baltimore** (301) 547-8678 • **Norfolk** (804) 627-3651 **Philadelphia** (215) 922-6200 • **San Juan (809) 724-2360**

McAllister

Snamprogetti & IMODCO Form Joint Venture

A joint venture between Snamprogetti and IMODCO, a unit of AMCA International based in the United States, has been awarded a contract by AGIP S.p.A., on a turnkey lump sum basis for a deepwater floating production storage and offloading terminal (FPSO).

The system will produce crude oil from an offshore oil field and will treat and store the product in a permanently moored converted tanker.

Production from the dedicated tanker will be transferred offshore to shuttle tankers.

The FPSO will be installed in a water depth of approximately 100 meters and will be connected to submarine wellheads controlled from the vessel.

This system is particularly tailored for the development of marginal offshore fields and for extended production testing of larger fields. The FPSO features a bow-mounted turret mooring developed by IMODCO for efficient permanent installations in intermediate water depths and moderate to harsh conditions.

The facilities will be installed by September 20, 1986. Total project turnaround time will be less than 12 months.

IMODCO, the originator of SPM technology, is a leader in the design and construction conversion management of tanker-based, floating production and storage systems. It's a unit of AMCA International, worldwide producer of a broad range of industrial products, machine tools, construction equipment and engineering and construction services.

Chinese Shipyard Delivers Mooring Platform For Use In The South China Sea

The Chinese shipyard Huangpu in Guangzhou handed over a 43-meter-high, 700-ton mooring platform to the Total China & Nanhai West Oil Co., for oil exploration in the South China Sea. The platform, designed to withstand the strongest hurricane, will be used for the transfer of oil to shore, and to anchored tankers up to 170,000 dwt.

Free 16-Page Color Brochure On TankRadar Offered By Saab Marine

Saab Marine Electronics AB of Gothenburg, Sweden, is offering a free 16-page color brochure on TankRadar, a new complete system for monitoring liquid cargoes in tankers.

The TankRadar system measures level, temperature and inert gas pressure in cargo tanks and the level in ballast and bunker tanks. The system will also compute volume and weight and can measure draught, list, pressure and other parameters.

Information is presented in analog or digital displays, in the form of mimic diagrams on a color VDU, and/or on portable wireless readouts. TankRadar can be interfaced with the vessel's load calculator or external computer system. Electronic remote control of pumps and valves can also be incorporated in the system.

All tankers and combination carriers may be equipped with TankRadar. Reliability and accuracy are unaffected by the chemical composition, temperature or density of the cargo. TankRadar can be specified for vessels that carry crude, refined petroleum products, bitumen or aggressive chemicals.

According to the brochure, the prime advantage of TankRadar lies in its use of microwave radar for level gauging. The method, developed by Saab, has already been installed on board more than 250 tankers.

The explanatory text of the publication details how TankRadar works, and is accompanied by excellent color drawings of the complete system as well as its individual components.

For a free copy of the brochure and additional information on Saab's TankRadar,

Circle 94 on Reader Service Card

NASSCO Elects Vortmann President And CEO

Richard Vortmann

National Steel and Shipbuilding Company (NASSCO) recently announced that **R.H. Vortmann** has been elected president and chief executive officer of NASSCO, a wholly owned subsidiary of Morrison-Knudsen Company, Inc. He succeeds **C.L. French**, chairman and chief executive officer, who retired.

Mr. **Vortmann** had served as president and chief operating officer since February 1984. Mr. **French** was elected to the position of chairman and chief executive officer at the same time.

Mr. **Vortmann** joined NASSCO in 1976 as vice president of finance and planning, became executive vice president-operations in 1980, and was elected president and chief operating officer in 1984. Prior to joining NASSCO, Mr. **Vortmann** held a number of financial management and corporate planning positions with the Kaiser companies. He holds Bachelor and Master of Business Administration degrees from the University of California at Berkeley.

Mr. **French** began his career with NASSCO in 1967 and served as vice president of engineering from 1974 to 1976, when he was elevated to executive vice president. In 1978, he was elected president and chief operating officer, a position he held until being elected chairman and chief executive officer.

"During **Larry French's** tenure as chief executive, NASSCO has been a star performer within the Morrison-Knudsen organization," said **W.J. Deasy**, president and chief executive officer of the Boise-based holding company. "On behalf of the corporation and its stockholders, I extend best wishes to him during his retirement," Mr. **Deasy** added.

Simplex Wire Awarded $4.2-Million Contract For Oceanographic Equipment

Simplex Wire and Cable Company, Portsmouth, N.H., is being awarded a $4,181,100 firm-fixed-price contract for oceanographic equipment. Work wil be performed in Portsmouth, and is expected to be completed in July 1987. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-86-C-0211).

Bardex Awarded Contract By Shell U.K. To Supply Rig-Skidding System

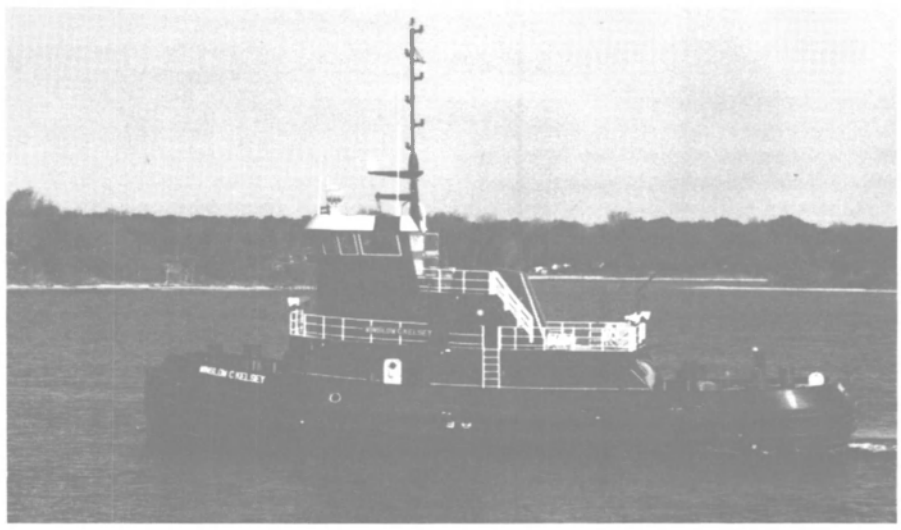
Shell U.K. Exploration and Production has contracted with Bardex Corporation, through its London office, for the rig-skidding system on the Shell Tern platform in the North Sea.

The system will consist of a control console and four hydraulic gripper jacks. The console will have the capability of skidding the skidbase in an east-west direction or the derrick module in a north-south direction. It will use two 400-ton hydraulic piston gripper jack assemblies for the skidbase skidding, and two 275-ton hydraulic piston gripper jack assemblies for the derrick module skidding.

Bardex (formerly Hydrautics Hydraulic Systems) is headquartered in Goleta, Calif., with offices in London and Houston. The company designs and manufactures heavy-load-moving equipment for offshore- and shipyard-related activities.

For additional information on Bardex,

Circle 65 on Reader Service Card



Eastern Marine Delivers Z-Drive Tug To GD-Electric Boat

Eastern Marine Inc., Panama City, Fla., has delivered a harbor/coastal-type, Z-Drive Class tugboat to the nation's leading producer of nuclear submarines for the U.S. Navy.

The 98-foot, 659-ton M/V Winslow C. Kelsey, built for General Dynamics' Electric Boat Division of Groton, Conn., will be used for coastal tows and maneuvering submarines at dockside.

The Winslow C. Kelsey is powered by two EMD 16-645E6a diesel engines developing a total of 3,900 brake horsepower. The Kelsey's engines are direct-coupled with two aft-mounted Ulstein Maritime model 1650M Z-Drive propeller units which each rotates 360 degrees under the tug's stern, requiring no rudders.

Her design incorporates optimum pilothouse visibility, with larger windows and a lower centerline exhaust stack, aft. The pilothouse does not have a wheel, and instead is operated by two joystick-type levers—one for each engine—that control both speed and steering. The tug's accommodations include two five-person staterooms, a galley and three heads, all above deck level, an important safety feature.

Eastern Marine, Inc., the co-designer and builder of the vessel, was selected by the Electric Boat Division on account of its reputation for quality construction, and ability to deliver vessels on time, and within budget. In addition, Eastern Marine's location in Panama City provides an attractive production climate due to near-perfect weather conditions, and an abundance of skilled, dedicated shipbuilding craftsmen.

WINSLOW C. KELSEY
Major Suppliers

Main engines (2)	EMD
Propulsion Units (2)	Ulstein Maritime
Hydraulic Steering	Ulstein Maritime
Steering Control System	Ulstein Maritime
Steering Alarm Panel	Engine Monitor, Inc.
Gridcoolers	R.W. Fernstrum & Co.
Generator Switchboard	Marine Electric, Inc.
Automation System	International Electronics
Generators (2)	Detroit Diesel
Air Compressors (2)	Quincy
Winches (2)	McElroy/Smatco
Capstans (2)	Smatco
Internal Communications	Henschel
Compass	American Skipper
Radar	Furuno
Gyrocompass	Robertson
Autopilot	Robertson
VHF radio	Raytheon
SSB radio	Stevens
Depth recorder	Furuno
Depth sounder	Datamarine
Loudhailer	Raytheon
Loran	Northstar
Intercom	Bogen
Windows	Marine Windshield, Inc.
Window wipers	Kearfott
Airhorn	Kahlenberg
Firefighting system monitor	Elkhart
Firefighting pumps	Aurora
Sewage treatment	Micropher

Eastern Marine, Inc. is engaged in the design and construction of cruise ships, ferries, inland and offshore tugs, barges, offshore support vessels, commercial fisheries vessels, and specialized U.S. military and government ships and barges.

For further information and full literature on Eastern Marine's facilities and services,

Circle 51 on Reader Service Card

Care Shipping Opens Deepwater Terminal At Port Of Houston

Care Shipping, Inc. has opened a newly constructed, deepwater ship and cargo terminal on a 50.7-acre tract of land fronting the Houston Ship Channel. Care acts as U.S. agent for several international shipping lines.

The facility, which includes a 500-foot dock and a 50,000-foot warehouse, is located in Jacintoport, 12 miles east of downtown Houston. Completed in the initial phase of development are an 860-foot bulkhead, the 70- by 500-foot dock, and seven acres of paved marshalling yard. Water depth at the terminal has been dredged to 38 feet. The facility, which has direct rail service, was designed for breakbulk as well as containerized cargoes.

MarAd Awards Contract To Great Lakes D&D For Maintenance Dredging

The Maritime Administration has awarded a $278,000 contract to Great Lakes Dredge & Dock of Oakland, Calif., for maintenance dredging at MarAd's Suisun Bay Reserve Fleet at Benicia, Calif. The dredging has been authorized by the U.S. Army Corps of Engineers.

Under the contract, Great Lakes will remove approximately 80,000 cubic yards by clamshell dredge around an operating barge and the base of the fleet site, a major anchorage of MarAd's National Defense Reserve Fleet.

Conference On Shipments Of Containers On Barges Set For April 29-30

The Maritime Administration has announced plans for a conference on shipments of containers on barges, to be held in New Orleans, La., on April 29 and 30.

The conference will be cosponsored by the Gulf Ports Association, the Inland Rivers Ports and Terminals, Inc., the Louisiana State University Ports and Waterways Institute and the Port of New Orleans.

Speakers will analyze both successful and unsuccessful container-on-barge systems to determine practical future courses of action. Workshop panels will address economic, marketing, operational, and technical issues.

Registration for the conference is $75.

For further information, contact **Jim Murphy** of MarAd's Central Region at (504) 589-6556, or **John Carnes** at MarAd's Office of Port and Intermodal Development at (202) 426-4357.

Kockums To Concentrate On Naval Construction After Phasing Out Merchant Shipbuilding

The Naval Division will be the most important business area when Kockums AB of Malmo, Sweden, phases out the production of merchant ships by 1988. The division is already responsible for an important part of Kockums' total activities.

The Swedish Government recently decided not to support the Malmo yard's merchant shipbuilding in a heavily subsidized market. Concurrently, Kockums' board of directors announced its decision that work at the shipyard in the future will be concentrated on the design, development, and construction of naval submarines and commercial underwater systems. These capabilities will furthermore be strengthened.

A proposal to establish a Swedish center for marine and underwater technology at Kockums will be examined by the Government. The Naval Division has a high-technology capability and has a large volume of orders in hand.

Baltek's 'AL-600' Increases Laminate Bond Strength, Cuts Resin Use And Labor

Baltek Corporation of Northvale, N.J., has developed "AL-600," a totally new core product with a revolutionary surface treatment engineered for hi-tech vacuum bag, pre-preg and wet sandwich layup construction of boats, industrial, aerospace and military products.

According to the manufacturer, the use of Baltek AL-600 greatly strengthens the inter-laminate bond in sandwich construction while substantially reducing the amount of resin required and effecting significant labor savings.

The sealed end-grain core in Baltek AL-600 requires less resin to wet out than cellular plastic or honeycomb cores. All laminating applications will benefit, especially those involving positive pressure such as vacuum-bagging, autoclaving and press laminating. Pre-wetting the core is no longer necessary with AL-600, saving resin and labor in wet laminations.

Chemically formulated to serve as a "tie-coat," the surface modification enhances the bond of the coating to the core and the resin to the coating. The bond is far greater than if the resin were applied directly over the unmodified core.

When general purpose polyester resins are used in conjunction with Baltek AL-600, strength improvements up to 20 percent have been achieved in comparison with Baltek's existing high bond strength core materials.

A further benefit is that the coating acts as a buffer between the organic balsa and the synthetic materials used by laminators. This minimizes any dimensional changes in the core that might occur due to variations in humidity. Longer gel times will be more easily accommodated.

All Baltek balsa is kiln-dried at the mill. Subsequent coating with resin in the AL-600 process further protects the encapsulated wood and enhances the fungicidal effect.

For further information on AL-600 from Baltek Corporation,

Circle 82 on Reader Service Card

RST Relocates To New Headquarters

Remote Systems Technology Inc., a subsidiary of Baldt Inc., has announced its relocation to new facilities. Their new address is 1800 West Belt North, Houston, Texas 77043.

Remote Systems Technology Inc. (RST) develops and markets acoustic components and systems for the exploration drilling and production phases of the offshore oil industry.

"RST has extensive capabilities in acoustic control, underocean power generating and energy measuring systems," said **James Palmer**, Baldt president and CEO. "The move to larger headquarters will enable RST to grow in new areas of subsea technologies."

For further information,

Circle 85 on Reader Service Card

Todd-Los Angeles Delivers 16th Guided Missile Frigate To Navy

The guided missile frigate Reuben James (FFG-57) was delivered to the U.S. Navy recently by the Los Angeles Division of Todd Pacific Shipyards Corporation, according to an announcement by **Len M. Thorell,** company vice president and general manager.

The Reuben James, completed 12 weeks ahead of schedule and below budget, is the 16th in the series of 18 frigates currently under contract at the Los Angeles Division. The 16 ships have been completed a total of 109 weeks ahead of contract schedule.

The Los Angeles Division equaled its FFG-7 Class record set on the previous frigate, USS Ford (FFG-54), by satisfactorily completing all contractor discrepancies prior to delivery. A first of the class record was also established by completing all government and contractor test requirements, both for systems and operational parameters, prior to delivery. As a result, Reuben James has set yet a new standard for readiness and completion at delivery.

Todd Shipyards Corporation, one of the nation's largest independent shipbuilding and ship repair companies, operates other yards in Seattle, San Francisco and Galveston. Its recently acquired ARO subsidiary is an international manufacturer of industrial air-powered equipment and aeronautical and environmental life support systems.

For further information and detailed literature on the services and facilities offered by Todd Shipyards Corporation,

Circle 4 on Reader Service Card

Minimizing Ship Operating Cost Discussed At Hampton Roads SNAME

"Minimizing Ship Operating and Support Cost" was the topic at a recent meeting of the Hampton Roads Section of The Society of Naval Architects and Marine Engineers. **Samuel Judge** of the Naval Sea Systems Command spoke to 87 members and guests at Fisherman's Wharf in Hampton, Va. Among the members present was **Lester Rosenblatt,** past national chairman of SNAME.

Mr. **Judge** is currently head of supportability engineering in the Hull Group of NAVSEA, with responsibility for ship administrative space design, storage and storeroom design, and whole ship logistics engineering. He has more than 20 years of experience in naval engineering. Previous NAVSEA assignments included branch head in the Survivability and Readiness Sub Group, and Ship Concept and Development Group.

The author discussed the need to reduce the life cycle cost (LCC) of a typical destroyer. The LCC is comprised of the acquisition cost and the operating and support (O&S) cost. Historically, attention has been focused on reducing acquisition; however, it will be difficult to achieve substantial future reductions without compromising performance. Future LCC reductions may be achieved by concentrating on the reduction of O&S cost.

Mr. **Judge** presented and discussed an examination of minimizing O&S cost with constraints on performance and ship readiness. A description of detailed cost drivers and technologies that can be used to achieve cost reduction were examined. Finally, a modification to the standard ship design team organization that would incorporate these technologies into a ship design was presented and discussed.

Energy Transportation Gets American Legion Merchant Marine Award

The American Legion National Mechant Marine Award for 1984-85 was presented recently by Senate Majority Leader **Robert Dole** (R-KA) to Dr. **C.Y. Chen,** chairman of Energy Transportation Corporation (ETC) of New York City, at a ceremony in the U.S. capital. This prestigious award, sponsored by the Robert L. Hauge Merchant Marine Post 1242 of the American Legion of New York, recognizes the outstanding contribution the company has made to the U.S. merchant marine industry through the development and successful operation of eight U.S.-flag LNG carriers.

Also in attendance at the presentation were Senators **Strom Thurmond** (R-SC), **Jesse Helms** (R-NC), and **Mack Mattingly** (R-GA) along with representatives of the Hague Post. Speaking at a reception following the presentation, Maritime Administrator **John Gaughan** congratulated Dr. **Chen** and ETC, noting that company's LNG project represents a highlight in the U.S. merchant marine.

American merchant seamen who have received special LNG training operate the ETC ships and handle their unique cargo. Built by the Quincy shipyard of General Dynamics in the late 70s, the ships now trade in the Far East carrying LNG from Indonesia to Japan under a 25-year contract with Burmah Oil. Built Under the Maritime Administration's Title XI mortgage guarantee program, ETC's sophisticated tankers provide safe, efficient, and economical transportation. Since the first vessel went into service in 1977, ETC has delivered more than 1,100 cargoes without a major incident.

Shown above at the American Legion National Merchant Marine Award presentation (L to R): **Gilbert Ross**, Brown & Ross; **James A. McQuilling**, Midland Marine; Dr. **C.Y. Chen**, chairman of the board, Energy Transportation Corporation; **David C. Hislop**, Commander, Robert L. Hague Merchant Marine Post; and Capt. **J.V. Caffrey**, Mobil Oil.

First Of Five Parcel Tankers Delivered To Stolt By Daewoo

The Stolt Sapphire, first of five 38,000-dwt parcel tankers being built for Stolt-Nielsen by Daewoo Shipbuilding & Heavy Machinery Ltd., was delivered at the Okpo shipyard in South Korea recently. The remaining ships, to be named Stolt Emerald, Stolt Topaz, Stolt Aquamarine, and Stolt Jade, are scheduled to be delivered this year and join the Stolt Tankers fleet.

These new ships will be among the most sophisticated and flexible parcel tankers in the world. About 70 percent of the total cubic capacity is acid-resistant stainless steel. They are designed to carry the full range of parcel trade products, ranging from full deadweight of inorganic acids such as phosphoric and sulphuric to 6,900 cubic meters of cooled semi-gases like propylene oxide; from the most toxic chemicals to the most delicate; and from edible oils to high-heat lube oil additives.

The Sapphire has an overall length of 580 feet, beam of 105.8 feet, depth to main deck of 49.2 feet, and design draft of 34.5 feet. Main propulsion is provided by a two-stroke Hyundai/B&W 6L60MC diesel engine with an output of 12,480 bhp at 111 rpm. Service speed is 15 knots at the design draft on a daily bunker consumption of 35.8 metric tons of heavy fuel oil, including full seaload on a 900-kw shaft generator.

The ship has 58 cargo tanks, each served by individual stainless steel cargo piping and individual hydraulically driven deepwell pumps, and 13 transverse cofferdams that effectively separate each cross-over group of cargo tanks. These features permit safe, segregated carriage of up to 58 different cargoes on the same voyage.

Many additional features add to the versatility of these parcel tankers. The air dehumidification plant for moisture control, the nitrogen storage plant and inert gas generator, availability of cargo heating by thermal oil, hot water or steam (up to 230 F in certain tanks), and the Skarpenord computerized Cargo-

(continued)

STOLT SAPPHIRE

Main engine	Hyundai
Propeller & bow thruster	Lips
Steering gear	Frydenbo
Engine control console	Terasaki
Torque meter	ASEA
Auxiliary boiler	Sunrod
Purifiers	Nagase/Alfa
Diesel generators	Yanmar/Taiyo
Emergency generator	Kosan
Shaft generator	Fuji
Main switchboard	Terasaki
Freshwater generator	Serok
Sewage treatment system	Sasakura
Incinerator	Golar
SatNav system	Tracor
SatCom system	COMSAT
Radars	Kelvin Hughes
Navigator	Decca
Weather facsimile	Alden
Gyro/autopilot	Anschutz
Cargo tank hatches	Daewoo/Normarine
Deck crane	Liebherr
Anchor & mooring winches	Daewoo/Norwinch
Cargo pumps & controls	Frank Mohn
Cargo valves	Westad
Fuel oil heating system	Bismo
Cargo heating oils	Bismo
Cargo cooling system	Frank Mohn
Dehumidifier system	Bry-Air
Inert gas generator	Holec
Liquid nitrogen plant	Linde
Tank cleaning machines	Polar Jet
Centrifugal pumps	Shinko
Gear/screw pumps	Taiko

Stolt Sapphire

(continued)
master cargo monitoring and control system, all enhance the cargo-handling capabilities of the ship.

Stolt-Nielsen caters to the "drug-store" trade on its worldwide tanker trade routes. These are the smaller bulk parcels that require the most careful handling. The delivery of the Sapphire and her four sister ships will increase the company's capabilities in this increasingly important transportation segment.

The Stolt-Nielsen Group is also engaged in all facets of waterborne and overland transportation, storage, and distribution of bulk liquids through its Stolt Terminals, Stolt Transportation Services subsidiaries, and can provide through transportation from any point to any point with one bill of lading, one freight rate, and one responsible party.

Stolt-Nielsen Inc. of Greenwich, Conn., is general agent in the Western Hemisphere for the Stolt-Nielsen Group of companies.

For a free brochure and full information on Daewoo's facilities,

Tidewater Acquires Four Offshore Support Vessels At Cost Of $2 Million

Tidewater Marine Service, Inc., a subsidiary of Tidewater Inc., recently acquired three 180-foot supply boats and one 190-foot towing/supply vessel at a total cost of approximately $2 million from the Continental Illinois Bank and Trust Company of Chicago. The four vessels, built in 1981 and 1982, have been overhauled and readied for service in the Gulf of Mexico, according to **Richard M. Currence,** Tidewater Marine president. He said that Tidewater continues to remove older, no longer profitable vessels from its fleet while acquiring newer equipment at attractive prices.

"Tidewater fully intends to retain its leadership role in the offshore marine support service market. We will maintain our leadership through our experience, the quality and variety of our vessels in service, the worldwide development of our fleet, and our desire to provide customers with the best available equipment and service," Mr. **Currence** said.

The three supply vessels have a beam of 38 feet and depth of 14 feet. Each develops 2,400 bhp; two are powered by Mercedes MTU diesel engines and the other is equipped with an Electro-Motive Division diesel. The towing/supply vessel has a beam of 38 feet and depth of 14 feet, and is also powered by EMD engines that develop 3,900 bhp. Average speed for all the vessels is 12 knots.

Navy Commissions Dock Landing Ship At Lockheed Shipbuilding

The Department of the Navy recently announced the commissioning of the dock landing ship Germantown (LSD-42) at Lockheed Shipbuilding and Construction Co., Seattle, Wash.

The principal speaker at the ceremony was Gen. **Paul X. Kelley,** USMC, Commandant of the Marine Corps, and the ship's sponsor was Mrs. **Barbara Kelley.**

Secretary of the Navy **John Lehman** announced the naming of the vessel in Philadelphia during the German-American Tricentennial celebration in October of last year. Germantown was the scene of a Revolutionary War battle. Dock landing ships are traditionally named for historic sites. Germantown will be the second U.S. Navy ship to bear that name. The first was a 19th century sloop-of-war commissioned at the Philadelphia Navy Yard in 1846.

The Germantown is 609 feet long, 84 feet wide and has a displacement of 15,745 tons.

Standard built-in adjustable stroke stops from 80° to 100° of travel.

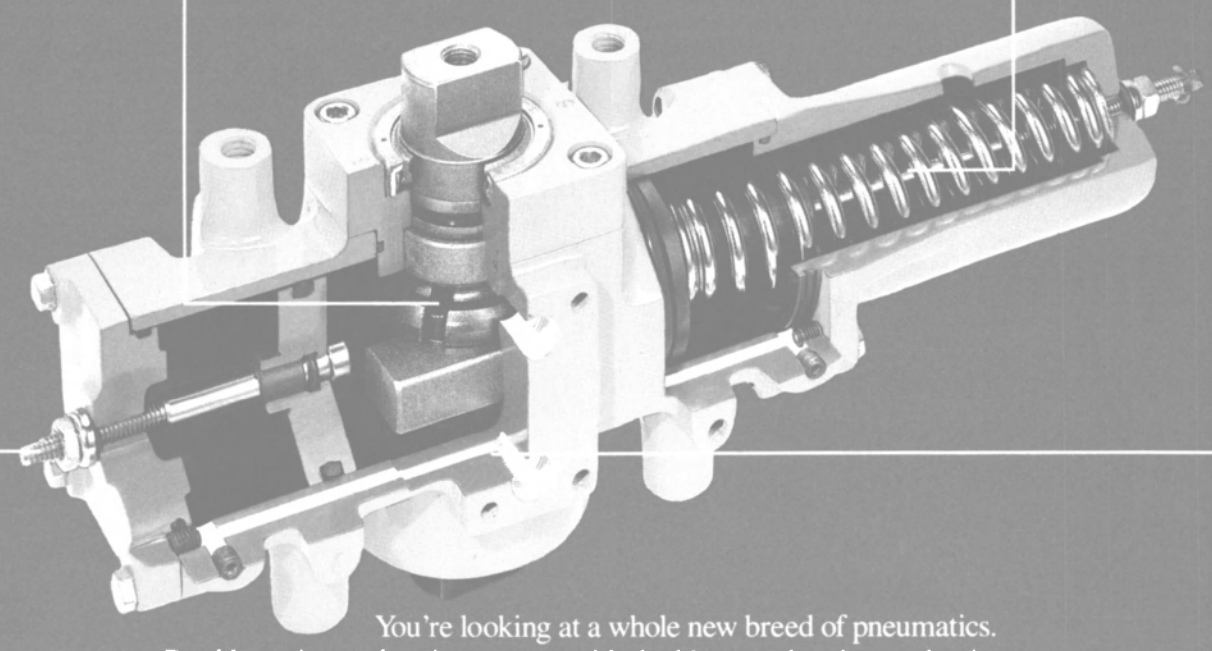
Double Scotch Yoke mechanism for superior balance and a more symmetrical configuration.

Double-acting and spring return models with torque outputs form 70-250,000 inch-lbs on supply pressures from 40 to 150 P.S.I.

All cast iron construction for extra durability in harsh or adverse environments.

Introducing
The New HR Series
Pneumatic Actuators
From Limitorque.

A Turn For The Better.



You're looking at a whole new breed of pneumatics. Double-acting and spring returns with double, scotch yoke mechanisms mean an actuator that delivers superior torque characteristics with total valve control reliability (a feature sometimes a little difficult to pin down with rack and pinion or single yoke construction). And because harsh environments take their toll all too quickly, ours is made of all cast iron to match the durability of our big "muscle" actuators. But for all its impressive features, we know that price and availability are at the heart of the matter. So you can take heart in knowing the new HR Series is very competitively priced and available in stock for immediate delivery. Add a full range of optional controls to meet your most exacting specifications, and you've got a pneumatic you can specify and forget. Because we not only back you with the industry's toughest new line of pneumatics, we'll support you every step of the way. It's what you'd expect from Limitorque. And we wouldn't deliver less. Our free brochure will tell you more. Just write or call.

Limitorque

Limitorque Corporation 5114 Woodall Road Lynchburg Virginia 24506 (804) 528-4400 Telex 82-9448

ASNE DAY '86

'Naval Engineering Challenges'

May 1-2, Washington, D.C.

ASNE Day 1986, the 98th annual national convention of the American Society of Naval Engineers, will be held May 1-2 at the Omni Shoreham Hotel in Washington, D.C., and will feature technical sessions, exhibits, an awards banquet, and other social functions.

At 9 am on Thursday, May 1, the ASNE Day keynote address will be delivered by the U.S. Navy's current head "surface warrior," Vice Adm. **Joseph Metcalf III,** USN, Deputy Chief of Naval Operations (Surface Warfare).

This year's technical program will feature 20 papers presented during eight separate sessions. Topics will include combat systems, command and control, ship design I and II, testing and reliability, hazardous materials, maintenance, and marine engineering.

The luncheon address on Thursday will be delivered by **Robert C. McFarlane,** former national security advisor to President **Reagan.**

On Friday evening, the 69th Annual Awards Banquet convenes in the Shoreham's Regency Ballroom. Guest speaker at the banquet will be Lt. Gen. **James A. Abrahamson,** USAF, Director of the Strategic Defense Initiative Organization, Department of Defense. General **Abrahamson** is responsible for the research and technology development program relating to defense against ballistic missiles.

ASNE Awards

The remainder of the banquet program will consist of presentations of several honors, including:

- The "Jimmie" Hamilton

Photos: Above—HMAS Sydney (FFG-03) built at Todd Seattle. Right—TWR built at Marinette Marine, Marinette, Wisconsin.

Award, presented to the author(s) of the original technical paper of greatest value and significance to naval engineering and published in the *Naval Engineers Journal* during the award year;

• The Frank Law Award, which recognizes unselfish contribution of time, energy, and talent to the Society over a sustained period;

• The Solberg Award, given annually to the U.S. citizen who has made the most significant contribution to naval engineering through personal research carried out during or culminating in the three-year period ending in the year of consideration;

• The Gold Medal Award, which is given annually to the U.S. citizen who, in the field of naval engineering, has made the most significant engineering contribution through personal effort, or through the direction of others, during or culminating in the five-year period ending in the year of consideration;

• The Harold E. Saunders Award, presented annually to the U.S. citizen who has demonstrated productivity, growth, and outstanding accomplishment in the field of naval engineering over the years, with ultimate wide recognition by his peers as a leader in the field and of such prestige as to merit acclamation by the naval engineering community.

More than 150 companies, military commands, and other organizations will exhibit their products, services, and capabilities. These displays and demonstrations will represent state-of-the-art technology and the latest developments of the industry that supports the development, construction, and outfitting of military and commercial vessels. Also represented will be the military laboratories and other commands that direct the programs and projects engaged in expanding and modernizing the U.S. Navy Fleet.

TECHNICAL PROGRAM

Thursday, May 1

Vice Adm. Joseph Metcalf III

9:00 am—Keynote address by Vice Adm. **Joseph Metcalf III,** USN, Deputy Chief of Naval Operations (Surface Warfare).

Session 1A—Palladian Room
Combat Systems I

Moderator: Rear Adm. **Lowell J. Holloway,** USN
Assistant: Cdr. **William F. Bassett,** USN

9:45 am—"An Experimental Expert Weapon Direction System," by **Robert L. Stewart** and **Douglas R. Ousborne.**

This paper discusses, in terms of general weapon systems operations, special requirements of real-time tactical situations, and a functioning experimental expert weapon direction system, a research project that addresses the efficacy of expert systems techniques for improving effectiveness of missile employments from Navy surface ships. The authors provide an overview of the current weapon direction system and associated missile employment operation as a basis for discussing timing and coordination requirements.

The paper concludes with a report on preliminary results from testing the experimental expert system at the engagement system land-based test site in Laurel, Md., and a summary of future plans.

10:30 am—"Master Ordnance Repair Applied: Standard Item 009-67," by **William A. Stimson,** Cdr. **Michael T. Marsh,** USN, and Lt. Cdr. **Richard M. Uttich,** USN.

The 600-ship U.S. Navy offers private shipyards an unprecedented opportunity for overhaul of surface combatants with complex combat systems. Recognizing the new challenge associated with the overhaul of high-technology combat systems in the private sector, the Navy in 1983 established the master ordnance repair (MOR) program,

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which was designed to identify and qualify those companies and private shipyards technically capable of managing combat systems work and conducting combat system testing.

The MOR program has had a limited effect to date because the role of the MOR company is nebulous and subservient to the prime contractor. The Navy is represented in a private shipyard by the supervisor of shipbuilding, conversion and repair. As he talks only to the prime contractor, the Navy has until now no effective means to establish a proper MOR role.

Standard Item 009-67 is the solution to this dilemma. Standard items establish uniform methods for requirements of ship repair and become part of the contract when they are invoked in the ship repair work package. This standard item describes to the Navy planner how to estimate the size of the MOR team appropriate in the work package, a feature that will insure that combat system bids are tailored to a specific availability.

Session 1B—Diplomat Room
Marine Engineering

Moderator: Vice Adm. **James H. Webber,** USN
Assistant: **James L. Corder**

9:45 am—"Composite Shafting for Naval Propulsion Systems," by **GeorgeF. Wilhelmi, William M. Appleman,** and Dr. **Francis T.C. Loo**

10:30 am—"Application of Alternate Cargo Pumping Systems in Naval Auxiliary Ship Designs," by **Alfred D. Issacson** and **John J. Kron Jr.**

The design of Navy auxiliary ships can benefit from the application of modern commercial tanker pumping systems practices. Navy auxiliaries that are outfitted for underway replenishment traditionally have at least one pumproom, and the designs are based upon a conventional pumproom-type cargo system with horizontal or vertical centrifuge cargo pumps. Each cargo tank has a dedicated suction line leading to the cargo pumps. In contrast, the latest commercial product tankers, especially lighters, that most closely resemble Navy auxiliaries in the manner in which they carry liquid cargoes, have been built with in-tank deepwell or submersible cargo pumps, thereby eliminating the pumproom. The application of this type of pumping system reduces the size of the ship considerably, thereby resulting in reduction of required propulsive power and fuel consumption as well as a dramatic reduction in construction cost.

The paper discusses the three most common pumping system designs, with variations of each, and illustrates the differences in the systems and their effect on the design of an auxiliary ship.

Robert C. McFarlane

Noon-2:15 pm—Reception and Luncheon, Regency Ballroom; "Jimmie" Hamilton Award and luncheon address by **Robert C. McFarlane,** former national security advisor.

Session 2A-Palladian Room
Ship Design I

Moderator: **Robert G. Keane Jr.**
Assistant: **Edward N. Comstock**

2:30 pm—"An Integrated Hull Design—Performance and Producibility," by **Sigurdur Ingvason, Donald N. McCallum,** and Capt. **Gilbert L. Kraine,** USCG (Ret.).

Recent European innovations in hull form design have highlighted the savings that can be achieved in ship powering requirements by hull modifications, principally at the

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bow and stern. Designs of one of the authors, Mr. **Ingvason**, are described and discussed. His twin-skeg, integrated hull design concept, which combines good hydrodynamic features with producibility, is analyzed by model testing in comparison to a recent U.S. Navy tanker design, the T-AO-187 Class. Gains on the order of 15 percent at the ship's design speed are predicted. Major producibility concepts and features are also discussed. These concepts capitalize on the experience of several Swedish shipyards.

3:15 pm—"Ship Design Computer Programs—An Interpolative Approach," by **Kenneth S. Brower** and **Kenneth W. Walker.**

Naval ship design synthesis computer programs, the original development of which was pioneered by the U.S. Navy, are now used by the Navy to conduct feasibility design studies and to conduct reverse engineering analyses of foreign ships. The use of these computer programs has substantially reduced the time and cost of conducting feasibility design trade-off studies and has allowed the ship design to develop very accurate design solutions that can be effectively used as the basis for preliminary and contract design.

The paper describes an interpolative technique for the ship design that the authors have developed and incorporated in a variety of ship design synthesis computer programs. This interpolative technique shortcuts the classic and time-consuming design spiral approach to conducting ship design studies.

4:00 pm—"Structural Design Methods for Surface Ships Operating at the Ice Edge," by **James R. Meyer** and **James St. John.**

Commercial oil exploration in the Arctic has stimulated a wealth of research programs on ice conditions, ice properties, and ice interaction with both structures and ships over the past 10 to 15 years. While much of the commercial research has been proprietary, many fine papers have been written to put some of the information into the public domain.

Government agencies such as the Maritime Administration, the Ship Structure Committee, and the Canadian Ministry of Transport have sponsored multiyear programs to gather valuable data pertinent to ship design in the Arctic, both to stimulate domestic shipbuilding and provide regulatory guidelines. This paper attempts to bring together appropriate pieces of this research to address the ship design problem for a vessel operating at the ice edge.

Session 2B—Diplomat Room Maintenance

Moderator: Capt. **Donald L. Hoffer,** USCG

Assistant: Capt. **James W. Kehoe Jr.,** USN (Ret.)

2:30 pm—"Assessment of Remaining Useful Life of Ship Service Turbine Generator Steam Chests," by **J.D. Byron, S.R. Paterson, R.R. Proctor,** and **T.J. Feiereisen.**

During the recent overhaul of an aircraft carrier, cracks were found in many of the eight ship service turbine generators. These units have had a history of cracking in the steam chest and steam passages as do other carriers. In the past, the cracks were ground and the units returned to service. During this overhaul, an in-depth analysis of the cracking problem was conducted that included: a detailed inspection of the units, a review of the startup procedure and comparison of it to industry practice, a test of thermocouples, a nonlinear stress and fracture mechanics analysis, and a recommendation for revised repair or operating procedures.

The results of this work showed that cracking would be confined and would not extend to a critical size prior to the next overhaul period, cracks need not be removed, and, in fact, removal of cracks would result in a degraded remaining service life. Results also showed that the life could be significantly enhanced with the use of a steam bypass to preheat the steam chest before startup.

3:15 pm—"An Expert System for Real-time Noise and Vibration Analysis of Shipboard Equipment," by **Steven K. Klein, Jeannine A. Vail,** and **Kevin Balon.**

This paper describes an expert

system that allows real-time analysis of the noise and vibration signature of vibrating machinery. The system presented consists of an adaptive algorithm that varies the bank width of analysis channels as a function of a signal complexity factor and a measure of the rapidity of local signal change. Overall program architecture is presented as well as detailed discussion of signature functional identification and statistical trend modules that are adaptable to a wide variety of input database configurations.

The paper presents results of a program execution on Navy hydrophone and propulsion gas turbine data showing current signature projections of trend to future times compared with failed condition signatures, and discusses correlation results for such predictions.

4:00 pm—"A Computer-Integrated Engineering System for Design & Life Cycle Management," by **Glen H. Nickodemus** and **Irwin D. Yanus.**

This paper examines a life cycle management program applicable to weapons systems, ships, and other multi-disciplined systems. A computer-integrated engineering system is presented that provides unique features for the design and configuration control functions of life cycle management. The system stores all engineering data in a relational database. Drawings are a subject of the engineering database and are not generated separately. Individual application databases define and process information necessary for specific discipline evaluations. Interface modules between the application databases and the engineering database insure that the entered data are complete, consistent, compatible, and in compliance with requirements. Conflicts are immediately identified and efficiently resolved, and logistic support activities are significantly simplified. The system also achieves cost reductions by reducing the number of design iterations, reducing the effort to implement changes, reducing storage and retrieval requirements, and reducing the need for ship checks prior to the modifications and alterations.

Friday, May 2

Session 3A—Palladian Room
Combat Systems II: Command & Control

Moderator: Capt. **James R. Williams,** USN
Assistant: **James F. Horton**

9:30 am—"A System Engineering Approach for Navy C^2 Applications," by **Daniel E. Donovan** and **Charles A. Lacijan.**

This paper emphasizes the importance of structured system engineering in complex communications (C) architectures. The focus is on acquisition of Navy command and control (C^2) programs. Many weapon, combat, and communication systems are acquired independently, with nominal consideration of interoperability or compatibility with other programs. Lack of authoritative guidance, discipline, and support is offered as a primary cause of this situation.

The paper begins with a discussion of the requirements for and the benefits of system engineering. A classic approach is described. The Navy's action to implement structured C^2 system engineerig is addressed. Technical sophistication in platforms, sensors, weapons, and electronics is identified as the primary reason for renewed emphasis on system engineering.

10:15 am—"Advanced Graphics for Command Displays," by **F. Jennings Willey** and **David W. Nesbitt.**

Application of computer graphics to tactical displays should not default to simplistic expectations or to clever uses of color. Under the sponsorship of the Aegis shipbuilding project, we have defined a method of applying advanced graphics techniques to command displays that asks "What is the display to do?" rather than "What color shall we make it?" The target display is the Aegis display system tactical plot, or track picture. This display has evolved to include graphic elements representing the environment, combat system capabilities, and battle plans. If these elements are all needed in the same display, the resulting picture has the potential for great complexity.

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This paper provides a method for designing uncluttered displays that contain the needed amounts of data. The method develops displays from primary system requirements and includes a computer program (a rule-based system) that assigns hardware attributes (including gray scale, color, and area fill) to components of the picture (display elements). The resultant display is data-intensive but not overwhelmingly complex.

11:00 am—"System Concept and Criteria for Battle Group Decision Making," by **David Abraham.**

The command and control system problem associated with the battle group, an ad hoc assemblage of naval resources with the mission of achieving a predetermined objective as assigned by higher authority, is discussed. After restatement of the problem, criteria for evaluating system concepts are proposed, with emphasis placed on combat environments.

The paper presents a concept for development of a battle group command and control system consistent with existing command philosophy and functional partition. The philosophic principle is command by exception in a multihierarchical structure. Functional partition into warfare areas such as ASW, AAW, and ASUW provides the basis for the multiple branches of the hierarchy.

Session 3B—Diplomat Room Testing & Reliability

Moderator: Capt. **James G. Burritt,** USN
Assistant: **Bruce H. Barber**

9:30 am—"Reliability of Shipboard Elevators—There Is Hope for Improvement," by **William C. Compton, Theodore C. Anderer,** and **Frederice A. Heinze.**

The history of Navy cargo/weapons elevator installations reveals wide variety of equipment sizes and configurations developed by numerous vendors working to different performance specifications for each contract. The result has been poor reliability, a proliferation of spare parts requirements, and logistic and maintenance nightmares. To correct this, NAVSEA has initiated a program to develop and test improved, standardized designs. The improvements include standard capacities and speeds, lightweight construction, and easy removability for maintenance. This is being accomplished through standard drawings and detailed, as opposed to performance, specifications. But the key to the success of this effort is to design and test for reliability, maintainability, and safety.

10:15 am—"Electronic Module Design Evaluation by Thermal Imaging Analysis," by **Kip O. Hoffer, Thomas W. Shaw,** and **Larry D. Robertson.**

Thermal imaging (thermography) is a noncontact measurement technique that can determine the temperature of an object by measuring the amount of infrared radiation generated by the object. As it is a noncontact method of temperature measurement, thermal imaging is useful in almost any situation where the surfaces to be measured are in motion, electrically hot, changing temperature rapidly, or where a contact measurement would tend to upset a thermal balance.

This paper reviews the work being done at the Naval Weapons Support Center in Crane, Ind., in the areas of thermal imaging and thermal design verification of electronic modules.

11:00 am—"Ship Systems Test Process—Concept and Application," by Capt. **David B. McGuigan,** USN (Ret.) and **William J. Boylan.**

Some technical managers are moving closer to a more disciplined approach when introducing ship systems into the fleet. In the past, many systems were installed with inadequate testing. The consequences show in impaired performance and system down-time.

Thorough, cohesive and well-managed testing will insure operationally ready ship systems. However, the technical manager must consider testing as an integral process

Lt. Gen'l J.A. Abrahamson
Guest Speaker at the Annual Awards Banquet, May 2.

of engineering and design. He can do this if he uses the total systems approach. Program management is adaptable to testing. In a test program, facilities, fuel, and manpower are significant cost factors. The technical manager can minimize test costs, however, and still use a facility that adequately meets his needs. He must be creative and innovative, and introduce techniques to reduce testing time and costs.

Session 4A—Palladian Room
Ship Design II

Moderator: **C. Lincoln Crane Jr.**
Assistant: **Terrence R. Applebee**
2:30 pm—"Development in SWATH Technology," by **S. K. Gupta** and **T. W. Schmidt.**

It has been more than two decades since SWATH technology development began in earnest, and it is no longer an "emerging" technology. SWATH ships are now state-of-the-art and the technology has come of age. With the construction of the 3,500-ton Kaiyo in Japan, SWATH vessels have moved from prototypes and demonstrators to modern, high-performance working vessels.

A number of new design techniques have been developed that enhance the seakeeping and maneuvering capability of these ships. Other concepts currently being developed include producibility improvements, structural design manuals, cost and weight estimation standards, and performance predictions based on scale models. A synthesis computer program has been developed for conceptually design based on existing SWATH ships and designs.

3:15 pm—"Simplified Approaches for Evaluation of Maneuverability of Ships," by Dr. **Volf Asinovsky.**

His paper is devoted to the consideration of simplified engineering methods for use in the practice of design and improvement of ship maneuverability. The dependence of the characteristics of maneuverability on the position of the center of pressure along the length of the ship's hull is shown. The paper gives a technique for the estimation of maneuverability during ahead and astern operations based on an analysis of the center or pressure position. It also discusses the physical reasons for loss of steering during astern operation, and reviews methods based on the use of the diagram of steering. A simple engineering method is given for calculation of the diagram of steering.

Session 4B—Diplomat Room
Hazardous Materials

Moderator: Rear Adm. **John W. Kime,** USCG
Assistant: **Thomas H. Vodicka**
2:30 pm—"Shipboard Stowage of Flammable and Combustible Liquids," by **Michael V. Dropik.**

The uncontrolled proliferation of flammables and combustibles aboard ship, in addition to posing an obvious fire and explosion hazard, has seriously degraded the survivability and increased the vulnerability characteristics of U.S. Navy surface ships. This problem for the most part has been superficially attributed to a widespread shortage of

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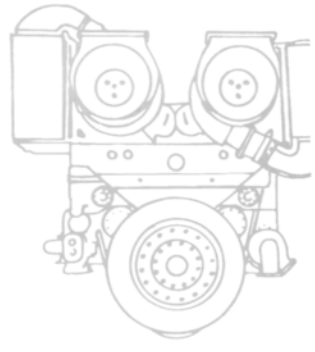

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flammable and combustible stowage capacity. As a result, current solutions have been limited to increasing stowage capability through additional storerooms and development of more efficient stowage aids. Unfortunately, these solutions simply address the symptoms, are of a corrective nature, and do not eliminate the fundamental causes of the problem.

This paper conducts a more systematic and comprehensive investigation into identifying and resolving the flammable liquids problem by considering it from ship life cycle perspective.

3:15 pm—"The In-Tank Oil/Water Separator," by **Norman B. Willner** and **Kevin D. Daigneault.**

Recently enacted public law and international treaties prohibit the discharge of oily wastes from oceangoing ships. To comply with these laws, the U.S. Navy and the Department of Defense have issued a directive implementing standards for the prevention of oil pollution from Navy ships.

Because of unique equipment and system design requirements for combatant and auxiliary ships in the U.S. Navy, research and development was initiated to develop oil/water separator systems. Over the past 10 years, three systems were developed that met the Navy's requirements and are currently installed aboard Navy ships.

Recently, a new generation of oil/water separator was conceived. Using existing oil coalescing theory and equipment already in the fleet, an in-tank oil/water separator (ITOWS) was developed. This new separator, installed aboard a naval combatant for testing, has met or exceeded all system requirements. Following a satisfactory operational evaluation by an independent U.S. Navy test command, the ITOWS will be specified for installation aboard new U.S. Navy ships.

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AEROFLEX INTERNATIONAL, INC.	215
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ALCO POWER, INC.	179
ALLOY SPOT WELDERS	16
AMERICAN MANAGEMENT SYSTEMS	212
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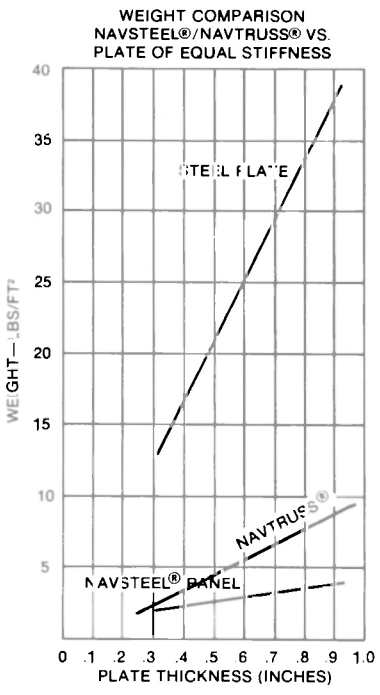

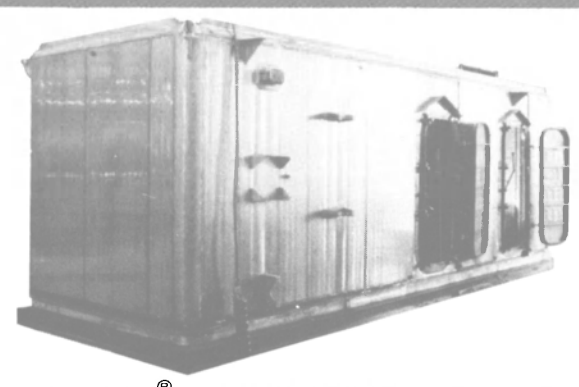

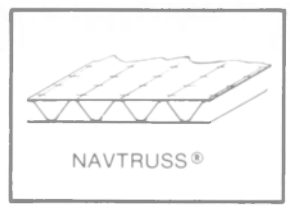

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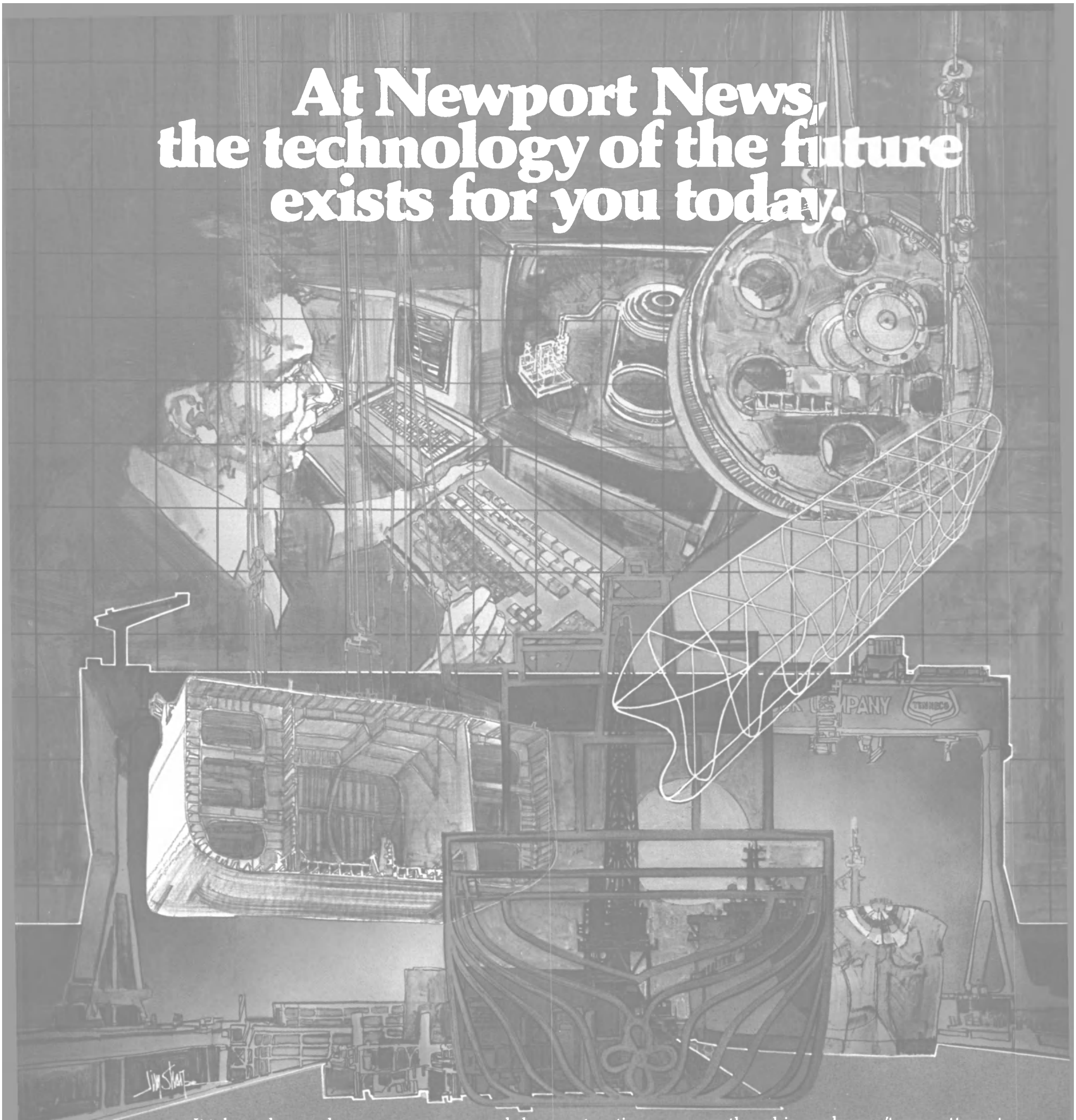

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For additional information about the technical presentations, exhibits, awards, or registration information, contact ASNE Headquarters,1452 Duke Street, Alexandria, Va., 22314; (703) 836-6727.

NAVSEA Awards Todd-Los Angeles $13.5-Million Contract

The Naval Sea Systems Command (NAVSEA) has awarded a firm-fixed-price contract of $13.5 million to the Los Angeles Division of Todd Pacific for the regular overhaul of the USS Ingersoll (DD-990), according to division vice president and general manager **Len M. Thorell.**

According to Mr. **Thorell,** the contract was competed for among all the shipyards on the West Coast. The work, to be performed from March to December of this year, will consist of major upgrades and modifications to the ship, including the weapon systems. The vessel is a Spruance Class destroyer.

Todd Shipyards Corporation is one of the nation's leading ship construction and repair companies. Besides the Los Angeles Division, Todd operates shipyards in Seattle, San Francisco and Galveston. Its recently acquired ARO subsidiary is an international manufacturer of industrial air-powered equipment and aeronautical life support products.

Price Renamed Chairman Of Liberian Shipowners' Group

Aubrey S. (Tony) Price was re-elected chairman of the board of directors during the recent meeting of the Council. He is president of Navcot Corporation, part of the Vlasov Group, and this is his second term as chairman of LSC.

Serving as vice chairmen will be **Frank S.B. Chao**, president of Wah Kwong Shipping and Investment Co. (H.K.) Ltd., and Capt. **Rodney G. Brown**, chief of ports, cargo and ships, Shell International Marine Ltd., London.

Biehl's Purchase Of U.S. Navigation Finalized

Biehl & Co., a well-known U.S. Gulf and South Atlantic steamship agency and stevedore, has acquired the major interest in U.S. Navigation, a former subsidiary of Hapag-Lloyd (America) Inc. Hapag-Lloyd decided to divest themselves of U.S. Navigation in order to better concentrate on its own complex linear services.

The combination of Biehl & Co. and U.S. Navigation, Inc. strengthens the general agency chain, which will now be represented on all three coasts of the U.S., as well as the Midwest.

John Springer, president of Biehl & Co., advised that Biehl and U.S. Navigation will be run as independent corporations and has named **Frank M. Cangemi** as president of U.S. Navigation, Inc.

U.S. Navigation is general agent in the U.S. for National Shipping Co. of Saudi Arabia, America Africa Line and Scindia Steam Navigation Co. Ltd.

Biehl acts as U.S. general agent for Hapag-Lloyd's Gulf and South Atlantic Service, Antilles Lloyd, Koctug Line, Maragua Line and Naviera Neptuno S.A.

In addition, Biehl acts as Gulf agents for Hapag-Lloyd's North Atlantic and EuroPacific Service, Columbus Line, Mexican Line, Rickmers Line, National Shipping Co. of Saudi Arabia, America Africa Line and Scindia Steam Navigation Co. Ltd.

Both organizations are deeply involved in Tramp/Tank, Husbandry and Vessel Agency.

Marine Machinery Association Meeting Set For Washington, April 30

The Marine Machinery Association will hold their next meeting at the Sheraton Washington (D.C.) Hotel on Wednesday, April 30.

The program is scheduled as follows:

9-9:15 Welcoming remarks, **D.A. Marangiello,** executive director, MMA.

9:15-10:15 Major General **Joe Morgan,** USAF, executive director for quality assurance, Defense Logistics Agency will describe programs being implemented by DLA to improve quality.

10:30-11:30 RAdm **Roger B. Horne, Jr.** USN, deputy commander for industrial facilities, 2nd Management, Naval Sea Systems Command, will discuss current status of industrial material improvements of NAVSEA.

11:30-1:30 Reception and Luncheon. Keynote speaker: Honorable **Les Aspin,** member of Congress, 1st district of Wisconsin, Chairman of the House Committee on Armed Services.

Afternoon Session—Restricted

1:45-2:30 **Robert McClory,** retired veteran of 20 years service in Congress from Illinois will explain how to conduct better liaison and more effective communication with elected officials in Congress.

2:40-3:00 Business meeting—establishment of working committees.

3:00-4:00 Individual committee working sessions.

Registration fees for the meeting are $75 for members, $200 for nonmembers. The Sheraton Washington will honor guaranteed rates of $110/single or $130/double from Tuesday April 29 through Saturday April 5 for those attending the MMA meeting. For hotel reservations, call (202) 328-2000 no later than April 11.

For further details on the April 30 meeting or on the Marine Machinery Association, contact the executive director, MMA, 1700 K St., NW, Washington, DC 20006 or call (703) 553-1821.

U.S. Naviation Names Capt. Frank Bullen Operations Manager

Frank M. Cangemi, president of U.S. Navigation, Inc., has named Capt. **Frank Bullen** operations manager, covering the U.S. for both liner and tramp/tank operations.

Mr. **Bullen** replaces **Ian Cairns** who will join Hapag-Lloyd (America) shortly. Mr. **Bullen** brings to his new position many years of experience in the handling of conventional and RO/RO tonnage.

U.S. Navigation, Inc. recently purchased by Biehl & Company, are general agents in the U.S. for The National Shipping Company of Saudi Arabia, America-Africa Line and Scindia, and are deeply involved in tramp/tank operations in New York, Philadelphia, Baltimore, Norfolk, and the West Coast.

FAST Systems Offers Free Brochure On Oil/Water Separators

FAST Systems, Inc., St. Louis, Mo., is offering a free eight-page brochure on their PACE SM-Series oil/water separators.

The publication details the construction, operation, equipment, design, capacity and certification of the PACE marine oil/water separators. The brochure comes complete with an application data chart with standard marine unit dimensions and data. The chart lists the model number, FAST Systems rated capacity, USCG/IMO rated capacity, dimensions, weights, maximum suction lift, maximum oil discharge head and pump motor horsepower.

According to the manufacturer, PACE (Positive Accelerated Coalescense of Emulsions) oil/water separators break true emulsions. PACE units convert gray emulsions into clear water and black oil. The water is suitable for legal discharge, and the oil is concentrated to the point where it will support combustion.

As an added feature, the brochure contains a detailed flow diagram of the workings of the PACE system. The diagram is numbered for simple reference to accompanying explanatory remarks.

For a free copy of the eight-page publication from FAST Systems,

Circle 79 on Reader Service Card

COMSAT Maritime Tests TV Transmission To Queen Elizabeth 2

COMSAT Maritime Services recently performed a successful experiement transmitting a compressed 768 Kbps service from its Southbury, Conn., Coast Earth Station to the Queen Elizabeth 2 of Cunard Lines. The one-hour program containing NBC Nightly News, ESPN SportsCenter, and Nightly Business Report was sent to the vessel on the first leg of her world cruise.

Participants in the experiment were:

- Cunard Line of London for the use of the QE2 as a platform-at-sea for receiving transmission of the TV signal;
- Compression Laboratories of San Jose, Calif., for the use of compression data modem equipment;
- Sea Tel of Martinez, Calif., for the use of the receive-only TVRO antenna;
- Shipboard Satellite Network of Northvale, N.J., for the programming skills and materials;
- International Maritime Satellite Organization (INMARSAT) for the use of the space segment; and
- COMSAT Maritime Services for the use of Coast Earth Station facilities in Santa Paula, Calif., and Southbury, Conn.

Up to eight hours of off-peak time will be made available in both oceans pending authorization by the INMARSAT Council and the FCC. It is expected this service will evolve into a video group call offering to be booked on a first come, first served basis.

For further information on the service,

Circle 30 on Reader Service Card

Specialty Systems Gets $10.1-Million Contract For Technical Services

Specialty Systems Incorporated, Toms River, N.J., is being awarded a $10,145,598 cost-plus-fixed-fee contract for engineering and technical services to assist the Naval Air Engineering Center, Lakehurst, N.J., in the initiation, design, development, production, deployment and retirement of Common Automatic Test Equipment (CATE) software. Work will be performed in Lakehurst (90 percent), and Toms River (10 percent), and is expected to be completed in February 1989. Eighty bids were solicited and two offers were received. The Naval Regional Contracting Center, Philadelphia, Pa., is the contracting activity (N00140-86-C-9411).

Hempel Offers Brochure On New Two-In-One Marine Coatings System

Hempel's Marine Paints, a worldwide coatings manufacturer, is offering a free color brochure detailing their recently launched two-in-one solution for on-board repair and maintenance, Combi-Coat.

The new two-in-one system combines both primer and finish in one coat, simplifying on-board repair, whether spot touch-up or general coating.

According to the brochure, the new system includes: Hempalin Combi-Coat 1212, an alkyd-based coating for the maintenance of alkyd systems; and Hempatex Combi-Coat 4680, based on acrylic resin for the maintenance of chlorinated rubber, vinyl and similar coatings.

Hempalin and Hempatex Combi-Coats are available in most standard shades, are easy to use, and only require normal surface cleaning and coating application.

Time spent on on-board maintenance is cut, stock levels and labor employed are reduced because of the product's simple application.

The color brochure provides an informative chart containing technical data on both the Hempalin Combi-Coat 1212 and Hempatex Combi-Coat 4680 systems.

For a copy of the free brochure and further information on Hempel's Marine Paints' Combi-Coat systems,

Circle 21 on Reader Service Card

Dravo Mechling Appoints McCormick Manager, Tiger Fleet Facility

Dravo Mechling Corporation, the barge line subsidiary of Dravo Corporation, has announced the appointment of **Frank McCormick** as manager of Dravo Mechling's Tiger Fleet facility in Baton Rouge, La.

In his new position, Mr. **McCormick** will be responsible for all of the fleeting services provided by Dravo Mechling at Tiger Fleet. In a related announcement, **Tom Farrington** has been appointed manager, boat maintenance and engineering at Tiger Fleet. Both will report directly to **D.J. Verona,** Dravo Mechling's vice president, operations.

A 21-year veteran of marine industry service, Mr. **McCormick** has extensive experience in fleeting operations, towboat operations, maintenance and repair, and general supervision. He has held positions with American Barge Company, C & G Operating Company, Coastal Towing, and Brent Towing. A graduate of Northeast Louisiana University and a Vietnam War veteran, he is also a pilot and licensed tankerman.

Located at Milepoint 237.5, Tiger Fleet provides barge fleeting and switching, as well as a wide range of cleaning, maintenance, and repair services for towboats, dry cargo and tank barges operating on the lower Mississippi River. Additional services provided include drydocking, crane, cargo transfer and 24-hour emergency repairs to barges and towboats.

Part of Dravo Corporation's Materials Handling and Systems Group, Dravo Mechling is headquartered in New Orleans, and operates an extensive fleet of river equipment, including open hopper, covered, deck and tank barges, throughout the inland waterways system.

Donahue, Inc. Names L.F. Daspit To Serve Clients In Southwest

Donahue, Inc. Advertising & Public Relations has expanded its professional staff with the addition of **Laurence F. Daspit,** who will represent the firm in Houston and throughout the Southwest. The announcement of this appointment was made by **James C. Donahue,** president of Donahue, Inc.

As a member of the agency's staff, Mr. **Daspit** will provide industrial public relations services to Houston-based Marathon Manufacturing Company. He will also serve Donahue, Inc. clients in the area of copywriting for advertising and collateral material and will be responsible for developing new accounts in Houston and throughout the Southwest.

Prior to joining Donahue, Inc., Mr. **Daspit** served as corporate public relations manager for Marathon Manufacturing Company. His public relations career also includes experience as a senior account executive with a major Texas firm where he specialized in industrial and health care accounts.

Taylor & G&G Marine Join Forces To Perform Hull Maintenance Work

Taylor Diving, Inc. of New Orleans, one of the world's largest and most diverse underwater contractors and a Halliburton subsidiary, has formed an exclusive working relationship with G&G Marine of Houston to perform ship hull maintenance and cleaning operations.

G&G Marine, operated by owner and president **Dan Gilbert**, was one of the pioneering ship hull-cleaning operations in the Gulf of Mexico. He has now joined the management team of Taylor to oversee the ship hull maintenance and cleaning operations. He will be headquartered in Taylor's Houston office.

For further information,

Circle 49 on Reader Service Card

MonArk Delivers Unique Fireboat To Newport News Shipbuilding

MonArk Boat Company of Monticello, Ark., recently completed its largest and most unique fireboat, a 45-foot, all-aluminum craft built for Newport News Shipbuilding of Newport News, Va. MonArk vice president of marketing and sales **Charles W. Mann** said the boat will be used primarily for fire and security patrol along the 3½-mile shoreline of the shipyard. It will patrol 24 hours a day operated by fully trained fire and security personnel.

Propulsion is by twin Detroit Diesel 8V-71N engines, each with an output of 325 bhp, providing a speed of 20.5 mph. Unlike most fireboats in its size range, which would normally use the propulsion engines to drive the fire pumps, the MonArk vessel features a fire system completely independent from the propulsion system, providing full maneuverability of the boat while pumping.

The fire system consists of two Hale 80FB pumps, each driven by a Detroit Diesel 8.2-liter engine rated at 240 bhp. Total output of the fire system is 4,000 gpm at 125 psi via three Elkhart Brass monitors, one forward and two aft. The forward monitor is remote-controlled and is rated at 2,000 gpm. The stream and direction patterns are regulated hydraulically and the monitor is capable of a 180-degree sweep. The two aft monitors are controlled manually and are each rated 1,100 gpm. All monitors are equipped with foam nozzles.

Four outlets are provided on the aft deck that enable dock fires to be fought through the use of hand hoses on shore.

The custom-designed cabin provides a near-panoramic view for the operator, giving him exceptionally good control of stream and direction.

Cabin accommodations include a galley with refrigerator, stove, and sink; there is an enclosed marine toilet. The air conditioned or heated cabin provides seating for five plus the pilot. The boat is equipped with a Westerbeke 6-kw genset; shore power may be used if needed.

Among the electronics are a Decca 370 BT 48-mile radar, a Raytheon DC 50 Fathometer, a customer-furnished siren/PA system, and VHF and UHF radios.

For additional information on MonArk Boat Company,

Circle 3 on Reader Service Card

Raytheon Awarded $33-Million Cost Modification To Contract

Raytheon Company, Equipment Division, Wayland, Mass., is being awarded a $33,000,000 cost modification to a previously awarded fixed-price-incentive-fee contract for long lead material for Aegis weapon system SPY-1 transmitters and fire control systems for the CG-63, CG-64 and CG-65 guided missile cruisers. Work will be performed in Wayland (25 percent), and Waltham, Mass. (75 percent), and is expected to be completed December 31, 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-84-C-5124).

Bailey Controls

Bailey NETWORK 90® : A microprocessor-based system so versatile, so adaptable that it delivers what you could only wish for up to now—**total vessel monitoring and control.**

Not just engine room control. But monitoring and/or control of radar, cargo tank level and temperature, inert gas pressure and ballast tank level. Electric control of pumps and valves. Load calculations. Monitoring and alarming for unmanned machinery. The whole ship's log of normally separate control functions —now right at your fingertips. For everything from deep-draft ocean-going vessels right down to smaller river and harbor craft.

Think what NETWORK 90 could save in labor, equipment and installation costs. How it could streamline and integrate your whole vessel operation. How this self-diagnosing, A.B.S. qualified Bailey system could put **you** on a new course for control efficiency. Microprocessor-based Bailey technology provides the security so vital for today. Modular system design plus a wide range of NETWORK 90 compatible products offer easy expansion tomorrow.

Total-control NETWORK 90. It's for people who want to run a very tight ship very economically. For full details, write us at 29801 Euclid Avenue, Wickliffe, Ohio 44092. Or call us toll-free at (800) 554-9030; in Ohio, (800) 554-9029. Bailey Controls, division of Babcock & Wilcox, a McDermott International company.

McDERMOTT INTERNATIONAL

Where the world comes for energy solutions.

Circle 170 on Reader Service Card

Main Iron Works Yard Acquired By Molaison

Main Iron Works, Inc. (MIW) of Houma, La., has been purchased from Sonat Marine Inc. of Philadelphia by **Leroy J. Molaison**, returning the shipyard to private ownership. Sonat marine, a subsidiary of Sonat Inc. of Birmingham, Ala., acquired MIW in 1979. Throughout its ownership, MIW has maintained a high market share in both new construction and more recently in vessel repairs.

In business since 1947, MIW has continuously adapted to the changes in the vessel construction and repair market. From the first steel vessel the yard built in the early 1950s to the latest modern designs, MIW has been a leader in the design of tugboats for use in the oilfields, in harbors, and on oceans throughout the world.

Recent improvements to the Houma facility, including an expanded drydocking area and a 3,500-ton drydock, should enable MIW to meet the future needs of the changing maritime industry. With the major emphasis currently on conversions and repowering of older vessels, MIW has a long and varied background in doing such work.

Other services at MIW include a complete ABS-certified machine shop, woodworking shop, electrical shop, and the capacity for mechanical and hydraulic repairs to a wide range of vessels including tugs, supply boats, jackup barges, riverboats, cargo barges, and inland drilling barges. Drydocking capacity ranges from 300 to 3,500 tons.

Throughout the change in ownership the management of Main Iron Works has remained intact. In addition to Mr. **Molaison** as president, current officers include **Wayne Piazza** as executive vice president, and **Harvey P. Landry** and **Henry Brunet** as vice presidents. Other management personnel at the facility include **Norris P. Guidry**, supervisor of fabrication and repairs; **Louis Prosperie**, machine shop supervisor; and **Kenneth Breaux**, electrical supervisor. These employees represent more than 140 years of combined experience.

For additional information on MIW,

Circle 25 on Reader Service Card

Craft Machine Awarded $20-Million Contract For Six Portal Cranes

Craft Machine Works Incorporated, Hampton, Va., is being awarded a $19,971,248 fixed-price contract for the design, construction and delivery of six 60-ton portal cranes. The contract contains four out-year options for an additional 17 cranes and a potential total value of $73,705,014. Three of the initial cranes are destined for the Norfolk Naval Shipyard, Portsmouth, Va., and one each to the Naval Submarine Base, Kings Bay, Kingsland, Ga.; Naval Shipyard, Philadelphia, Pa.; and the Polaris Missile Test Facility, Atlantic, Charleston, S.C. The cranes will be designed in Duluth, Minn., and manufactured in Hampton. Work on the first phase of the contract is scheduled to be completed in June 1988. The final option, if exercised, is scheduled to be completed in March 1991. Eleven bids were received. The Naval Facilities Engineering Command, Philadelphia, is the contracting activity (N62472-82-C-1455).

Port of Galveston Appoints Matson Agencies Western U.S. Sales Agents

Matson Agencies and the Port of Galveston recently announced the appointment of Matson as the port's exclusive sales and marketing agents in 13 Western states.

The agreement was signed by **C.S. Devoy**, executive director and general manager of the Port of Galveston, and **Eugene R. Swanson**, president of Matson Agencies, in Matson's headquarters in San Francisco. The western sales and marketing efforts of the Port of Galveston will be carried out through Matson offices at Los Angeles, Seattle, Portland and Honolulu, in addition to San Francisco.

Prominent Shipbuilder Robert M. Fraser Dies At Age Of 70

Robert M. Fraser, 70, of Superior, Wisc., well-known Great Lakes shipbuilding and shipping executive, died recently following a lengthy illness. He devoted most of his life to shipbuilding at the head of the Lakes, rising from helper to president of his own company, Fraser Shipyards, Inc. in Superior.

He first worked as a helper at Marine Iron and Shipbuilding's Duluth yard in 1932 while still attending school, and went to work full time after graduation. In 1941, when Globe Shipbuilding Company was organized in Superior, Mr. **Fraser** joined it as hull superintendent, and at the age of 26 was probably the youngest shipyard superintendent in the U.S. He served in that capacity through World War II.

When Superior's Knudsen brothers took over operation of the old American Shipbuilding Company yard in 1946, Mr. **Fraser** went with them as superintendent. In 1955 the shipyard was sold to Mr. **Fraser** and **Byron Nelson**, and with the latter's retirement in 1964, Mr. **Fraser** took over full operation of the yard, where he continued until his retirement in 1974.

Robertson-Shipmate Offers New Compact VHF Radio —Literature Available

Shipmate has developed a compact VHF radio that meets even the most stringent sea safety requirements.

The RS-8000 is a fully synthesized radiotelephone with U.S. and international VHF channels and dual-watch, channel-16 priority with the capacity for all future channels when authorized.

Shipmate's RS-8000 comes complete with handset and extension speaker. Transmission power is the maximum allowable-25 watts. Each and every component is individually computer tested under temperature conditions ranging from −18°F to +131°F before ever leaving the factory.

Shipmate created this compact VHF radio with the idea of meeting the safety requirements for using a compact instrument. The RS-8000 measures 2.2 by 6.3 by 7.8 inches.

For further information and complete literature on this new product,

Circle 77 on Reader Service Card

MacGregor-Navire To Build Moveable Link Span For Oslo Port Authority

MacGregor-Navire has won an order to supply Oslo's Port Authority with a moveable-type link span. Designed to service two axial-ramped ships simultaneously, the 58-meter floating, pontoon-based unit, is due for delivery early in September this year.

This will be Oslo's second link span of the floating type. The first installation, 39 meters in length, was supplied by Navire in 1980, and is now hard pressed to cope with the increasing volume.

The new "double access" link span will provide a maneuvering area sufficient to accommodate the turning circles of the largest vehicles.

The new unit will be installed at the 352-meter-long Sorenga Quay on the port's Bispevika Wharf, mainly used by Fred Olsen Lines.

For further information, including detailed free literature on MacGregor-Navire equipment and systems,

Circle 62 on Reader Service Card

Circle 286 on Reader Service Card

Circle 350 on Reader Service Card

Circle 216 on Reader Service Card

M.A.N.-B&W Holds Worldwide 4-Stroke Diesel Sales Conference —Literature Offered

More than 100 members of M.A.N.-B&W Diesel's worldwide four-stroke division sales force convened in Augsburg, Germany, to celebrate the 2,000th anniversary of the city where the diesel engine was born.

The focus of their meetings, however, was not on the city's illustrious past—or their company's long and distinguished history. Instead, participants in the three-day annual conference concentrated their deliberations on ways to further improve M.A.N.-B&W Diesel's range of sales and services to its global network of customers.

During a series of working sessions, teams of diesel sales specialists considered a wide variety of techniques for enhancing the company's position as a world leader in the design and construction of engines for propulsion and power-generation systems. Each working team presented its recommendations to conference participants through a designated spokesman.

The team topic which was subsequently voted "best" was presented by **Edward A. Waryas** (U.S.A.), the elected spokesman for the team.

In the presentation, entitled, "How to Identify and Satisfy Customer Needs," Mr. **Waryas** noted that it is not enough in today's highly competitive environment simply to present M.A.N.-B&W as "the original diesel engine company . . . the first company to develop a marine diesel . . . or the company by which all other diesel manufacturers are measured.

"To effectively serve our customers, we must strive constantly to provide caring attention through all phases of newbuilding and repowering contracts—and particularly the after-sales period."

Management and sales staff selected this winning topic as best representing one of the top priorities for the future of the M.A.N.-B&W Diesel Corporation.

For further information and free literature describing the complete line of M.A.N.-B&W engines,

Circle 53 on Reader Service Card

Shown (L to R) are team members: **Werner Oehlers** (Germany), **Wulf-Dieter Kirst** (Germany), **O.E. Larsen** (Canada), **Edward A. Waryas** (U.S.), **Sig. Hatting** (Denmark), and **Hugo Reimers** (Denmark).

Navy Awards $97.5-Million Addition To Penn Ship For Third Fleet Oiler

The Department of the Navy has exercised an option under its current contract with Pennsylvania Shipbuilding Company of Chester, Pa., for the construction of a third fleet oiler of the T-AO-187 Class. This $97.5-million award, added to the first two oilers that were ordered last year, brings the total contract value to approximately $320 million. The latest ship, T-AO-194, is scheduled for delivery in September 1990.

Work will begin on the new ship in October this year. The award of the contract at this time, however, allows Penn Ship to purchase materials and equipment needed for a three-ship program. More importantly, the new ship provides security of employment for the shipyard's work force through September 1990.

The Navy has additional options under this contract for two more ships of the same class. These options can be exercised at any time between October 1, 1986 and March 31, 1987.

The T-AO-187 Class is designed for the underway replenishment of Navy ships at sea. Each is 667 feet 6 inches long with a beam of 97 feet 6 inches and draft of 35 feet. They will carry 180,000 barrels of fuel and are powered by state-of-the-art diesel engines of 32,000 bhp total, providing a service speed of about 20 knots. The Military Sealift Command will operate them with a Civil Service crew of 95 and a Navy detachment of 21.

Penn Ship is one of the country's largest and most versatile shipyards, engaged in the construction, conversion, overhaul, and repair of all types and sizes of Navy and commercial vessels.

Brazil's State-Owned Docenave Acquiring Ten Big Bulk Carriers

Either directly or through wholly owned subsidiaries, the Brazilian shipping company Docenave, the shipping arm of the State-owned Companhia Vale do Rio Doce mining company, has ordered 10 new bulkers totaling 1,535,200 dwt. Deliveries are scheduled between 1986 and 1988.

Ishikawajima do Brasil is building two 305,000-dwt ore/oil carriers for Wilsea, a new Liberian-registered joint venture between Docenave and Wilh. Wilhelmsen of Norway. To be powered by fuel-efficient Ishibras/Sulzer 8RTA84, 22,340-bhp diesel engines, these giant ships will each have a capacity to carry 211,500 cubic meters of ore or some 2,217 barrels of oil, yet will use 50 percent less fuel than other ships of the same size.

Docenave's subsidiary Seamar Shipping Corporation ordered three 150,000-dwt bulk carriers from Verolme est do Brasil. Each will be powered by a 6L80MCE M.A.N.-B&W diesel with an output of 17,100 bhp, providing a service speed of 13.8 knots.

The other five ships, ranging up to 170,000 dwt and totaling 475,200 dwt, are being built by the Verolme and Emaq shipyards for Docenave itself.

Both the Seamar and the Wilsea contracts are being financed by the Banco do Brasil Export Finance Department.

Aguirre Appointed New Manager Of Operations At Interocean Management

The chairman and chief executive officer of Interocean Management Corporation (IOM), **George P. Steele,** has announced the appointment of Capt. **Jorge Aguirre** as manager of operations for the company. Capt. **Aguirre** had previously served as port captain, and has been with the firm since 1980.

IOM is a managing operator of oceangoing vessels, with contract covering a variety of ships including tankers, RO/ROs, and auxiliary craneships. Capt. **Aguirre's** new responsibilities will include the direction of the safe, economic, and efficient navigation and cargo operations of all vessels under IOM jurisdiction.

Interocean is headquartered in Philadelphia, with a branch office in Long Beach, Calif.

DAMPA Inc. Relocates Head Office In U.S. To Baltimore, Md.

DAMPA Inc. recently announced the relocation and opening of its head office in the United States. The address is: DAMPA Inc., Suite 106-108, The Gatehouse at North Park, Hunt Valley, Md. 21030.

DAMPA also announced that its staff has been expanded to facilitate DAMPA's "turnkey" image for habitability areas in the marine industry.

Besides ceiling systems, DAMPA now offers a complete joiner system that includes: ceiling systems; bulkhead/panel systems; door systems; window box systems; module prefab bathrooms/wet spaces completely outfitted; furniture—both aluminum and steel as well as veneer; carpeting and decking systems; fabrics for drapes and furniture; lighting system; heating ventilation and air conditioning systems; hardware to support the preceding; total technical design and manufacture for ease of installation; and technical support personnel for the preceding.

The DAMPA Joiner System is USCG approved, and complies with Solas 74, B-15 and A-60 requirements. Furthermore, the DAMPA Navy Continuous Ceiling System has received NAVSEA B-Shock approval.

From 1956, more than 1,500 marine vessels around the world have chosen DAMPA concepts.

For further literature containing full information,

Circle 87 on Reader Service Card

OTC-'86

SPECIAL PREVIEW

May 5-8, 1986, Houston

The 1986 Offshore Technology Conference (OTC), to be held at the Astrodomain in Houston May 5-8, focuses this year on world trade and the increased recognition of OTC's role in bringing together U.S. and international exporters, importers, and registrants to view the world's largest exhibition of offshore equipment, products, and services.

With attendance expected to exceed 60,000 international and U.S. engineers, scientists, and managers, this year's OTC will offer many attractions, including a comprehensive technical program of 46 sessions with more than 250 technical papers from every oil-producing area of the world, three keynote general-interest sessions with high-level speakers, as well as an unmatched exhibition of products, equipment, and services from more than 1,500 of the world's foremost manufacturers of offshore-related equipment.

With U.S. Department of Commerce endorsement and acceptance into the prestigious Union of International Fairs, OTC presents increased opportunities for technical

(continued)

OTC '86

continued

cooperation and communication among the international offshore community. For the first time at OTC, Commerce Department staff will direct foreign visitors to appropriate exhibitors, and counsel U.S. exhibitors on export/import matters. Foreign trade delegates will receive the OTC Export Interest Directory to help them locate available products, services, and equipment exhibited at OTC.

The exhibition, including special indoor and outdoor areas, opens at 8:30 am Monday, May 5. Exhibition hours are 8:30 to 5 pm, May 6 and 7, and 8:30 to 3 pm, May 8.

The array of drilling rigs, Christmas trees, blowout preventers, and high-tech data acquisition systems will also include a walking undersea robot. An invention of Mitsubishi Heavy Industries Ltd., the robot walks on four spider-like legs on the sea bottom near foundations and structures to perform assigned tasks. Mitsubishi will demonstrate the robot at its booth during the exhibition.

More than 10 national groups plan exhibits, including Norway, Italy, the Netherlands, United Kingdom, West Germany, and France. Canada will combine the booths of all its provinces into one giant 18,000-square-foot exhibit, another exhibition highlight.

The world's largest forum for development of offshore and ocean resources, OTC is sponsored jointly by 11 of the world's foremost engineering and scientific organizations, including The Society of Naval Architects and Marine Engineers and the Marine Technology Society, with worldwide membership of more than 700,000. The Society of Petroleum Engineers in Richardson, Texas, manages the conference for the sponsoring organizations.

Topical Lunches

This year the OTC will again offer its popular series of topical luncheons. The four informal luncheons scheduled will allow many opportunities for stimulating discussions between speakers and audiences.

On Tuesday, May 6, two luncheons are scheduled: Challenges and Achievements—StatPipe Transportation System, given by **Tor Espedel,** vice president of pipeline technology for Statoil; and Technical and Business Strategies and Business Strategies for Frontier Developments, by **R.E. KMcKee,** manager of North American production for Conoco Inc. Norway's StatPipe is the world's largest offshore gathering system, crossing the Norwegian Trench twice at 1,000 feet to deliver North Sea production to shore.

On May 7 a special panel will discuss The Human Resources Aspect of Deepwater Production Operations. Panelists will be **John A. Haeber,** retired president of Vetco Offshore Inc.; **Ron L. Geer,** senior mechanical engineer for Shell Offshore Inc.; **Dillard S. Hammett,** vice president of SEDCO-Forex; and moderator **Joe W. Key,** director of R&D for Offshore Production Systems Inc. For Wednesday's second luncheon, **H.R. Brannon,** senior research scientist at Exxon Production Research Company, will speak on Deepwater Development Alternatives. The many designs for structures and systems to develop deepwater oil and gas reserves reflect current thinking about how deep the offshore industry can go.

The informality of these topical luncheons encourages frank discussion of issues during question-and-answer periods. The series is one of the most popular technical attractions of the annual conference and exhibition.

OTC Awards

The Offshore Technology Conference will present its 1986 Distinguished Achievement Award to **W. Harry Mayne,** consultant for

Geosource Inc., and to McClelland Engineers Inc., both of Houston. Recipients will be honored at the OTC Awards Luncheon on May 5 at 12:15 pm in the Astrohall Ballroom.

Mr. **Mayne** will receive the OTC Award for Individuals for his contributions to the science of geophysical exploration. He invented the common depth point (CDP) method used in nearly all offshore seismic and exploration work. The CDP is largely responsible for the noise reduction that makes it possible to perform seismic work under continuous tow. No single technique has contributed more to the success of offshore seismic work and petroleum exploration.

The 1986 recipient of the OTC Distinguished Achievement Award for Companies, McClelland Engineers, has made distinct and unique contributions to marine geotechnical engineering for 38 years. The firm's development of engineering techniques for analysis and design of offshore structure foundations, and procedures and equipment for geotechnical data acquisition have benefited materially the safety and cost aspects of foundations for offshore structures.

Technical Program

Monday • 9:00 a.m. to 12:00 noon

Arctic Ice and Wind Forces • Room 118

OTC
5084 **Ice-Floe Wave Drift Experiments**
V.W. Harms, U. of California

5085 **Motion of an Ice Mass Near a Large Offshore Structure**
M. Issacson, U. of British Columbia, and F.D. Stritto, Mobil R&D Corp.

5086 **Wave Driven Icebergs Impacting Against an Offshore Structure**
M. Salvalaggio, BP Alaska Exploration Inc., and M. Rojansky, Ben C. Gerwick Inc.

5087 **Structural Integrity of Semi-Submersibles and Gravity Platforms to Bergy-Bit/Iceberg Impact**
A.S.J. Swamidas and H. El-Tahan, Memorial U. of Newfoundland; M. Arockiasamy, Arctec Newfoundland Ltd.; and R. Abdelnour, Florida Atlantic U.

5088 **Numerical Simulation of Wave Runup and Armor Stability**
N. Kobayashi, U. of Delaware, and I. Roy and A.K. Otta, U. of Delware

5089 **Prediction of Uplift Wave Force on Large Caisson Structures Installed on Rubble Mound**
S. Fujii, Taisei Corp.

Field Development • Room 114

OTC
5090 **The North Sea: Where to Now?**
J. Haggarty and G. Mathewson, Scottish Development Agency

5091 **The Lessons From 7 Years of a First Generation North Sea Platform and Planning to its End-of-Field Life**
C.R. Bond and P.G. Shaw, Britoil plc

5092 **Deepwater Multiwell Production System Study**
J.S. Lim, Vetco Gray, and G.L. Barker, ARCO

5093 **Geisum Field Development**
R.L. Tucker, Conoco Inc., and N.C. Roobaert, Paragon Engineering Services

5094 **Milne Point Production Facilities: A Design for a Marginal Arctic Oil Field**
M.D. McGee, Conoco Inc., and J.E. Dysert, Fluor Engineers Inc.

5095 **Marginal Field Exploration and Production in the Arctic**
R.E. Potter and M.E. Potter, Arctic & Offshore Technology Inc.

Wave Forces • Room 109

OTC
5096 **Forces on a Large Cylinder in Random 2-Dimensional Flows**
G. Rodenbusch and C. Kallstrom, Shell Development Co.

5097 **An Empirical Model for Random Directional Wave Kinematics Near the Free Surface**
G. Rodenbusch and G.Z. Forristall, Shell Development Co.

5098 **Random Directional Wave Forces on Template Offshore Platforms**
G. Rodenbusch, Shell Development Co.

5099 **Measured Fluid Forces on an Accelerated/Decelerated Circular Cylinder**
A.R. Bird, consultant, and L.F. Mockros, Northwestern U.

5100 **Biplanar Linearization of Drag Forces With Application to Riser Analysis**
B.J. Leira and A. Olufsen, SINTEF

5101 **Non-Linear Random Wave Loading on Fixed Offshore Platforms**
N. Spidsoe, SINTEF

5102 **Dynamic Pressures Around a Vertical Cylinder in Waves**
S.K. Chakrabarti, A.R. Libby, and D.J. Kompare, CBI Industries Inc.

Geotechnical Site Investigations • Room 108

OTC
5103 **Large Scale Penetration Test at a Deep Water Site**
T.I. Tjella and A.A. Rannestad, Statoil

5104 **Results of Recent Cone Penetrometer Testing in the Gulf of Mexico**
J.A. Focht Jr., G.W. Johnson, and C.A. Rivette, McClelland Engineers Inc.

5105 **Deep-Water Geologic and Soil Conditions and their Engineering Implications, Northern Gulf of Mexico**
K.J. Campbell and J.R. Hooper, McClelland Engineers Inc., and D.B. Prior, Louisiana State U.

5106 **Generalized Soil Conditions Encountered in the Campos and Sergipe Basins, Offshore Brazil**
M.J. Morrison, McClelland Engineers Inc., and C. Machado, Petrobras

5107 **Geotechnical Potentials of Offshore Seismic Reflection Profiling in the Niger Delta**
S.U. Ejezie, U. of Port Harcourt

5108 **Seabed Strengthening by Deep Cement Mixing**
M. Halebsky, Hale Enterprises, and S. Wetmore, Global Marine Development Inc.

Fracture Control Room • Room 105

OTC
5109 **Modifications to the CTOD Design Curve Approach**
M.G. Dawes, The Welding Research Inst.

(continued)

OTC '86

continued

5110 **Crack Tip Opening Displacement in Heavy Section Steel Plate and Its Welded Joint**
Y. Nakano, M. Nagayasu, K. Ota, S. Takizawa, and H. Nishizaki, Kawasaki Steel Corp

5111 **Application of the Finite Element Alternating Method to Offshore Structural Fracture Mechanics Analysis**
H.C. Rhee, Conoco Inc

5112 **A Fracture Mechanics Based Inspection Criterion for Internal Walls of Offshore Wellhead Equipment**
R.E. Frishmuth, Cortest Applied Mechanics Inc

5113 **Recent Developments in the Reassessment, Maintenance and Repair of Steel Offshore Structures**
M. Lalani and I.E. Tebbett, Wimpey Offshore Engineers & Constructors Ltd

5114 **Stress Distribution and Crack Initiation Prediction of Tubular X-Joint**
D.J.C. Lub, Gusto Engineering C.V. and R. Zijm, IHC SMIT BV

Offshore Instrumentation, Power and Fiber Optic Application • Room 100

OTC

5115 **The Benefits of Conducting a Vessel Noise Survey Prior to Installing an Acoustic Sensor**
J.L. Roberts, Honeywell Marine Systems Division

5116 **Results of the Molikpag Instrumentation System**
K.C. Witney, Weir-Jones Engineering Consultants, and V. Neth, Gulf Canada Resources Inc

5117 **A Distributed Data Acquisition and Control System for a Semi-Submersible Drilling Rig**
L.L. Hawn and B.A. Gordon, Santa Fe Drilling Co.

5118 **Composite Power and Optical Submarine Cable for Off-Shore Applications**
B. Cantegrit, C. Bayard, and J.P. Trezeguet, Les Cables de Lyon

5119 **Marine Applications for a Continuous Fiber Optic Structural Strain Monitoring System**
D.S. McKeehan, Intec Engineering Inc.; R.W. Griffiths, consultant; and J.E. Halkyard, Offshore Technology Corp.

5120 **Generation of Electrical Power from the Florida Current of the Gulf Stream**
J.R. Farrell, B.V. Davis, D. Swan, and K. Jeffers, Nova Energy Ltd

Geophysical Interpretation • Room 202

OTC

5278 **Pulsed Neutron Log Application in California: Improved Capability via Borehole Decay Correction**
J.L. Baldwin, Welex

5279 **Pitfalls of Amplitude Versus Offset Analysis for Seismic Lithology Prediction**
G. Gassaway, R.A. Brown, and L. Bennett, Terra Linda Group Inc

5280 **Prediction of Abnormal Formation Pressures in Sedimentary Sequence, Offshore Pakistan from Seismic Data**
H.A. Raza, Hydrocarbon Development Inst of Pakistan

5281 **Drilling Prediction Before Drilling: A Panel Discussion**
Panelists:
R.W. Baird, Baird Petrophysicals;
D. Louden, L-R Resource Development Group;
L. McClure, consultant;
P. Pilkington, Conoco Inc.;
D. Stone, Seismograph Service; and
R. Weakley, Chevron U.S.A.

Monday • 2:00 p.m. to 5:00 p.m.

General Session—Offshore Technology—A Historical Review • Room 118

Features a review of worldwide developments in offshore technology with keynote presentation by R.J. Howe, President, Pennzoil. Traces developments in offshore technology from exploration to production and transportation—and focuses on challenges of ultra-deep waters and arctic, ice-covered areas. Chronicles the operating challenges in the offshore that have been overcome by application of engineering and scientific principles, and presents a statistical look at pertinent data now and over a period of three decades as offshore technology has evolved to its present state.

Ice Mechanics • Room 114

OTC

5127 **Non-Simultaneous Failure and Ice Loads on Arctic Structures**
A.C. Palmer, Andrew Palmer & Assocs. Ltd

5128 **Theoretical and Experimental Prediction of Sheet Ice Forces on Multiple Cylindrical Legs**
V. Vivatrat and V.L. Chen, Brian Watt Assocs. Inc

5129 **Scale Effect and Compressive Strength of Large Volumes of Ice**
E.M. Gershunov, Santa Fe/Braun

5130 **Analysis of Ice Forces on a Caisson-Type Arctic Platform**
R. Hakala, Technical Research Ctr. of Finland; A. Joensuu, Wartsila Arctic Research Ctr.; E. Eranti, Finn-stroi Ltd.; and S.S. Gowda, Technical Research Centre of Finland

5131 **Sea Ice: Concrete Sliding Abrasion Test**
H. Saeki, Hokkaido U.; Y. Asai, and A. Yoshida, Taisei Corp.; T. Takeuchi, Hokkaido U., and E. Suenaga, Sapporo U

5132 **Submarine Breakwaters: A Novel Concept in Wave Shielding**
E. Melun and J. Stamnes, Norwave, and F.G. Nielsen, K. Herfjord, and T. Simonstad, Norsk Hydro a.s

Tubular Joints • Room 109

OTC

5133 **Behavior of Tubular T and K-Joints Under Combined Loads**
Y. Makino and Y. Kurobane, Kumamoto U., and S. Takizawa and N. Yamamoto, Kawasaki Steel Corp

5134 **Finite Element Analysis of Multi-Brace Non-Coplanar Tubular Joints**
Q. Chen and N. Liang, Chinese Inst. of Mechanics

5135 **The Effect of Chord Stresses on the Static Strength of DT Tubular Connections**
R.M. Weinstein, Brown & Root Intl. Inc., and J.A. Yura, U. of Texas

(continued)

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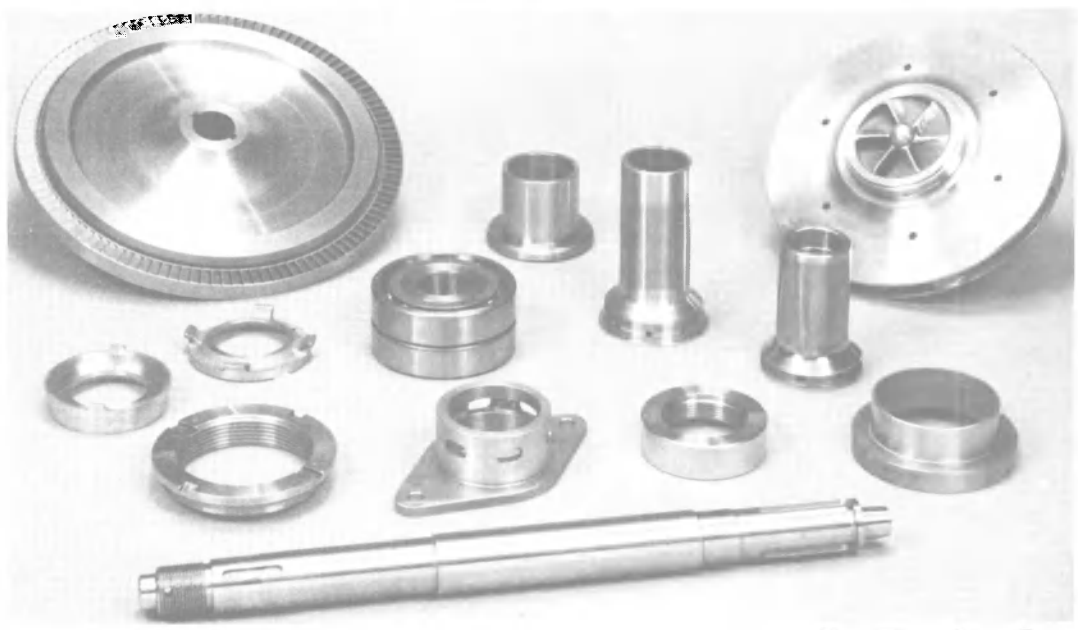

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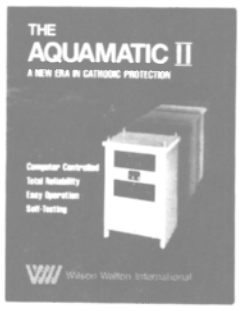

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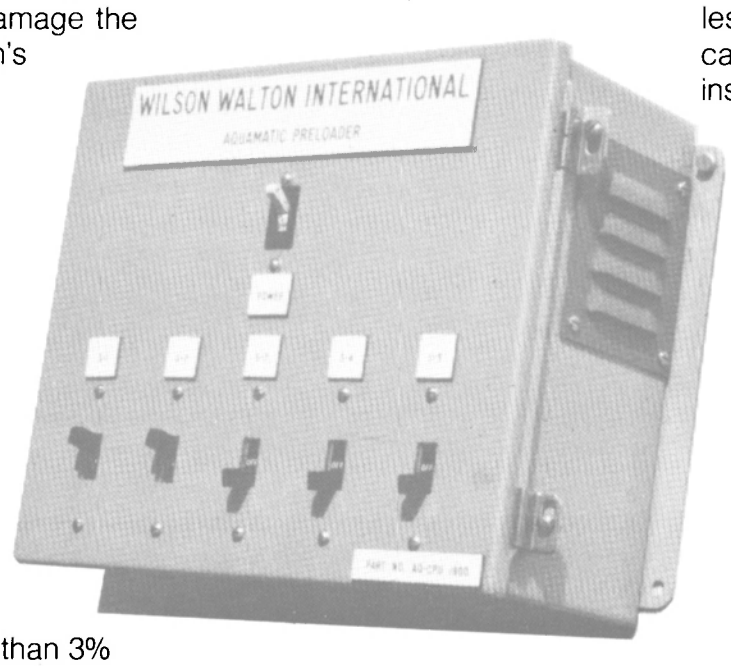

The **AQUAMATIC PRE-LOADER** has been designed to solve exactly this type of problem. It can be installed on any type of ICCP system, regardless of the Manufacturer or the rated capacity of the system. It can be installed by the ship's crew in about 1 to 2 hours. Once installed, the crew would adjust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

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- Will work on any ICCP system regardless of manufacturer or system capacity
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- 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
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- Lowers operating voltage at the anodes
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- Prolongs hull coating life

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OTC '86

continued

5136 **Elastic-Plastic Finite Element Analysis of Grouted Tubular Joint**
H.C. Rhee, Conoco Inc

5137 **Calculation of the Maximum Stress for Multi-Brace Non-Coplanar Tubular Joints**
N. Liang and C. Qiye, Chinese Inst. of Mechanics

5138 **Static and Fatigue Strength of Overlapped Cast Steel Node**
K. Nakamura, H. Sada, T. Shinke, and B. An, Kobe Steel Ltd

Wave Forces and Dynamic Response • Room 108

OTC

5139 **Nonlinear Wave Load Effects on the Stochastic Behavior of Fixed Offshore Platforms**
J.M. Niedzwecki, Texas A&M U., and E.W. Sandt, Naval Ocean Systems Ctr

5140 **An Investigation of the Importance of Joint Probability and Directionality of Environmental Data for Platform Design**
J.B. Nielsen and O. Brink-Kjaer, Danish Hydraulic Inst., and C.K. Grant and R.W. Webb, BP Intl. Ltd

5141 **Random Responses of Semi-Submersibles: Finite Band Width Approach**
P. Mukerji, McDermott Engineering

5142 **Extreme Value Statistics and Exposure Time: A Simple Method to Establish Well Defined Design Criteria for Marine Operations**
K. Lindemann, Det norske Veritas

5143 **Analysis of the Effect of Currents on Wave Forces Measured on an Offshore Structure at Sea**
P. Kaplan, Virginia Polytechnic Inst. & State U., and M. Dummer, Naval Civil Engineering Laboratory

5144 **Field Measurement of Tension-Leg-Type Marine Observation Buoy**
N. Kuchida and Y. Tanigawa, Ministry of Transport, and S. Ueda, M. Katayama, and M. Ozaki, Mitsubishi Heavy Industries Ltd

Pile Foundations • Room 105

OTC

5145 **Analysis of the Performance of Piles in Silica Sands and Carbonate Formations**
R.G. Bea, S.I. Guttman, and S. Vahdani, PMB Systems Engineering Inc.; R.M. Meith and S. Paulson, Chevron Corp.

5146 **Lateral Loading Tests on Large-Diameter Steel Pipe Piles Installed in Carbonate Rock and Soils**
J. Hagenaar and C.S. Chandrasekhar, PRC Engineering Inc.

5147 **CAPWAP Analysis Increases Ability to Properly Design Piles in Calcareous Sands**
R.N. Dutt, Seafloor Engineers; W. Teferra, Petro Drive Inc.; and W.E. Nelson, Amoco Production Co.

5148 **Axial Behavior and Capacity of Driven Piles in Calcareous Sands**
B.T.D. Lu, The Earth Technology Corp.

5149 **Frictional Characteristics of Calcareous Sands from Offshore Florida**
R.N. Dutt, Seafloor Engineers; E.H. Doyle, Shell Development Co.; S. Nandlal, Shell Oil Co.; and W.B. Ingram, Seafloor Engineers

5150 **Shaft Frictional Resistance of Long Pipe Piles Driven into Dense Sands**
S-I. Tsien, Chinese Inst. of Mechanics

Metallic Materials • Room 100

OTC

5151 **Development of Non-Magnetic Drill Collar With High Stress Corrosion Resistance**
T. Nakazawa, T. Suzuki, T. Sakamota, Y. Yakaki, and Y. Sakamoto, Nippon Steel Corp.

5152 **Severe Environment 18⅝-in. 15,000-psi Wellhead**
C.F. Boehm Jr., Hughes Drilling Equipment

5153 **Monitoring of Crack Formation and Crack Growth in Steel Structures by the Electric Field Signature Method (FSM)**
H. Hognestad, Ctr. for Industrial Research (SI)

5154 **Corrosion and Cracking of Steel in Production of Gas With Liquid H_2S and Brine**
A. Miyasaka, K. Dempo, and H. Ogawa, Nippon Steel Corp.

5155 **High Performance Tendon for TLP Manufactured by Q & T**
Y. Takeshi and H. Mimura, Nippon Steel Corp.

5156 **Trial Production and Material Evaluation of TLP Tension Legs**
I. Sakaguchi, T. Sawamura, H. Sakamoto, Y. Komizo, K. Iwata, and K. Kawai, Sumitomo Metal Industries Ltd.

Seafloor Surveying and Mapping • Room 202

OTC

5272 **Sub-Meter Accuracy With GPS C/A Code in Dynamic Applications**
J. Ashjaee, Trimble Navigation Ltd.

5273 **A Multi-National Consortium Opportunity for Remote Sensing**
P.M. Maughan, Space Development Service

5274 **Using Kriging to Map the Ocean Floor**
M. David, Ecole Polytechnique

5275 **Reconnaissance Seafloor Mapping of Louisiana Nearshore Platforms for Site Characterization to Study Fate and Effects of Produced Water**
D.C. Rhoads, Science Applications Intl Corp., and E.C. Revelas and J.D. Germano, Science Applications Intl. Corp.

5276 **Mapping Seafloor Geoacoustic Properties in Shallow Water From Monochromatic Pressure Field Data: Two Methods Based on Hankel Transform Inversion**
G.V. Frisk and J.F. Lynch, Woods Hole Oceanographic Instn., and G.J. Tango and M.F. Werby, Applied Acoustics/NORDA

5277 **Applications of a New Fast Reflectivity Method to Marine Horizontal and Vertical Seismic Profiling**
G.J. Tango, NORDA

Tuesday • 9:00 a.m. to 12:00 noon

Risers • Room 118

OTC

5163 **Flexible Production Riser System for Floating Production Application in the North Sea**
M.J. Bouvard, Coflexip S.A., and T.R. Mahoney, North Sea Sun Oil Co.

5164 **Development of a Flexible Marine Riser System**
K. Ishii, T. Okamoto, and N. Tachibana, The Furukawa Electric Co. Ltd., and T. Miyazaki and Y. Washio, Japan Marine Science & Technology Ctr.

5165 **API Load Rating of Marine Riser Couplings: Application of RP 2R Guidelines and Supplemental Methods**
R. Beers and D.L. Thomas, Vetco Gray

5166 **Upper Marine Riser Package**
J.S. Lim and J.R. Pfeifer, Vetco Gray R&D

5167 **Operational Use of an Instrumented Marine Riser Joint**
R.J. Stinner, Offshore Technology Corp., and S. Katayama, Japan Drilling Co. Ltd.

5168 **The Suppression of Vortex Induced Oscillation in a Marine Riser With Low Structural Damping in High Multi-Directional Currents**
C.E. Cunningham, FMC Corp. (U.K.) Ltd

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Role of the ROV in Offshore Oil • Room 114

OTC
5169 **The Role of the ROV in 1985: A Capability in Transition**
F.R. Frisbie, Ocean Systems Engineering; R.L. Wernli, Naval Ocean Systems Ctr.; and D. Given, Windate Enterprises Inc

5170 **ROV Involvement During Installation, Inspection, Maintenance and Repair of Offshore Structures**
A. Watt, Sub Sea Intl. Inc

5171 **An ROV Work System Designed for Deepwater Pipeline Repair**
D.C. Beebe, Ocean Systems Engineering Inc.; J.S. Kuehn, Chevron Corp.; and M.J. Kirby, Flow Industries Inc

5172 **A Technology Forecast for ROVs in the Offshore Oil Industry**
E. Jackson, Intl. Submarine Engineering; and T.B. Sheridan, MIT

Wind and Wave Forces • Room 109

OTC
5173 **A Wind Tunnel Investigation of Aerodynamic Loads on a Typical Tension Leg Platform**
A. Kareem, U. of Houston

5174 **Wind Loads on Semi-Submersible Offshore Platforms**
P. Freathy, Atkins R&D; and B.J. Vickery, U. of Western Ontario

5175 **Progress in Computer Simulations of SPM Moored Vessels**
J.E.W. Wichers, Maritime Research Inst. Netherlands

5176 **Evaluation of Low Frequencey Wave Damping**
G.E. Hearn, U. of Newcastle-upon-Tyne

5177 **Assessment of Interaction Effects on Floating Production Systems**
I. Padilla and D.G. Owen, Heriot-Watt U.

5178 **A Dynamic Analysis Method for Structure On-Bottom Stability**
P.E. Christiansen, J. Dolwin, and E.J. Piermattei, Earl & Wright Ltd.

Exploration in Sedimentary Basins • Room 108

OTC
5179 **Oil Potential in the Gulf of Thailand**
P. Polahan, Dept. of Mineral Resources, Thailand

5180 **Hydrocarbon Potential of an Island Arc Summit Basin, New Hebrides Arc, Southwest Pacific**
F.L. Wong, U.S. Geological Survey

5181 **Permo-Triassic Extension: A Major Feature in the Subsidence of the North Sea Basin?**
S.J. Hellinger, J.G. Sclater, and M. Shorey, U. of Texas

5182 **Fluid Flow, Hydrocarbon Generation and Migration: A Quantitative Model of Dynamical Evolution in Sedimentary Basins**
I. Lerche, S. Cao, and W.H. Glezen, U. of So. Carolina

5183 **Deep Heatflow Measurements in the Barents Sea**
G. Zielinski, Omegalisk International Ltd.; J. Geise, and M. Zindberg, Fugro BV; and T. Gunleihsrud, IKU

5184 **The Ocean Drilling Program: Status of Initial Eight Cruises**
P.D. Rabinowitz, L. Garrison, B. Harding, S. Herrig, R. Kidd, R. Merrill, and R. Olivas, Ocean Drilling Program

Lightweight Materials • Room 105

OTC
5185 **Lightweight Materials for Deepwater Offshore Structures**
M.M. Salama, Conoco Inc.

5186 **Compliant Production Riser Analysis and Development for Deep Water Tension Leg Platforms**
M.R. Heim and D.L. Jones, Vetco Gray

5187 **Performance Analysis of an Aramid Mooring Line**
P.G. Riewald, E.I. du Pont de Nemours & Co.

5189 **Residual Strength of Polyaramid Rope**
S. Tsuruta, Tokyo U. of Mercantile Marine

5190 **Flexible Pipe: New Technology for Deep Water and Marginal Field Development**
B.C. Dubois, Simplex Wire & Cable Co.

Satellite Applications • Room 100

OTC
5191 **Measuring Platform Subsidence Using GPS Satellite Surveying**
J. Collins, GEO/HYDRO Inc

5192 **Satellite Data in Support of Arctic Offshore Operations in the 1990's**
J. Crawford, Jet Propulsion Lab. of Cal Tech

5193 **New Standard for Satellite Communications**
J.C. Bell, Intl. Maritime Satellite Organization

5194 **Differential GPS for Offshore Marine Navigation**
A.K. Brown, Litton Aero Products

5195 **Application of Personal Computers to Precision Rig Positioning and Lay Barge Control**
J.O. Hill, Oceanonics Inc.; and J.R. Stoltz, Alpha Systems Concepts Inc

5196 **Precise Integrated Navigation Systems and the Development of the Electronic Chart**
R.R. Good, H.H. Lanziner, and B.A. Ridgewell, Offshore Systems Ltd

Marine Minerals and Mining I • Room 202

OTC
5197 **Resource Potential for Sand and Gravel Within the United States Exclusive Economic Zone**
S.J. Williams, U.S. Geological Survey

5198 **Placer Deposits of Heavy Minerals in Atlantic Continental Shelf Sediments**
A.E. Grosz, E.C. Escowitz, and J.C. Hathaway, U.S. Geological Survey

5199 **Application of the Induced Polarization Method to Offshore Placer Resource Exploration**
J.C. Wynn and A.E. Grosz, U.S. Geological Survey

5200 **Results of Survey for Heavy Minerals in the Continental Shelf of Sardinia (Italy)**
C. Del Fa; R. Peretti, and A. Zucca, U. di Cagliari, and R. Borghesi, Soc. Progemisa

5201 **The Geology and Geochemistry of Exhalative Ore**

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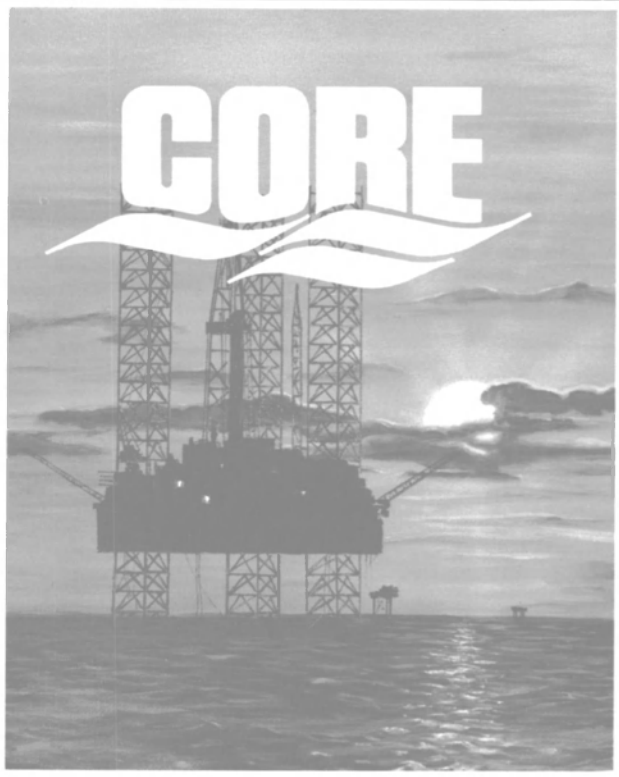

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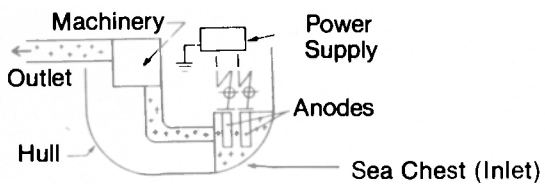

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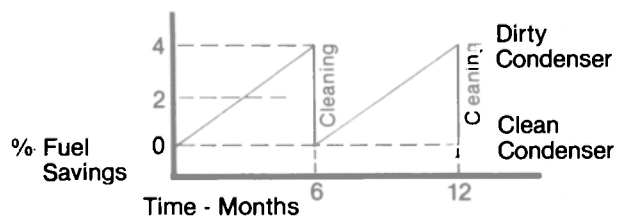

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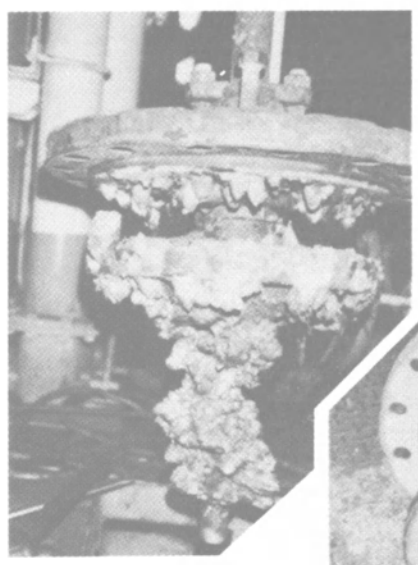

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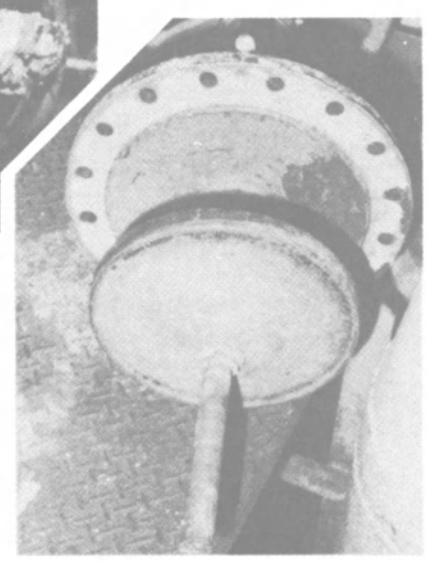

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5202 **Design of Gimbal Mounted, Heave Compensated, Hydraulic Pipe Handling Systems for Deep Ocean Mining, Offshore Oil Drilling and Deep Ocean Scientific Coring**
J.P. Latimer, D.C. Tolefson, and R. Kaufman, Deepsea Ventures Inc

Tuesday • 2:00 p.m. to 5:00 p.m.

General Session—Future Worldwide Offshore Exploration Prospects • Room 118

A survey of worldwide offshore exploration prospects focuses on prospects for future exploration and includes discussion of economic and technology conditions that will be required. Leading industry spokesmen will present exploration forecasts for the coming decade.

Mooring Forces • Room 114

OTC

5203 **An Engineering Assessment of the Validity of the Quasi-Static Approach to Semi-Submersible Mooring Design**
F.A. Ramzan and R.W. Robinson, Brown & Root (UK) Ltd

5204 **Influence of Mooring Line Damping Upon Rig Motions**
E. Huse, Martinek

5205 **Full-Scale Vessel Current Loads Data and the Impact on Design Methodologies and Similitude**
P.A. Palo, Naval Civil Engineering Laboratory

5206 **Analysis of the Slowly Varying Motions of a Floating Production System**
J.E. McDowall, Offshore Technology Corp

5207 **The Influence of Thunderstorm Generated Rapid Wind Shift on the Design of Single Point Moorings**
G.J. Shoup and P.A. Lunde, Cities Service Oil & Gas Corp.

5208 **Dynamic Positioning of Large Tankers at Sea**
J.A. Pinkster, Maritime Research Inst. Netherlands

Oceanography and Meteorology • Room 109

OTC

5209 **Characteristics of Wave Groups in the Arabian Sea Associated With Cyclonic Activity**
P. Vethamony and J.S. Sastry, National Inst. of Oceanography

5210 **Environment Conditions in the South China Sea Offshore Malaysia: Hindcast Study Approach**
O. Brink-Kjaer, A. Kej, V. Cardone, L. Swee, and E. Pushparathnam, Danish Hydraulic Inst

5211 **Forecasting Extreme Wave Episodes Along the California Coast**
R.J. Seymour and D.R. Cayan, Scripps Inst. of Oceanography

5212 **Parametric Modelling of Directional Wave Spectra**
N. Hogben and F.C. Cobb, British Maritime Technology Ltd

5213 **Surface Current Real-Time Prediction for Search and Rescue**
D.F. Paskausky, U.S. Coast Guard R&D Ctr

5214 **The Results of the CODAR Offshore Remote-Sensing Project**
M.W. Spillane, Chevron, R.D. Crissman, M.W. Evans, CODAR Technology Inc., D.E. Barrick, B.J. Lipa, Ocean Surface Research, and B. Braennstrom, Saga Petroleum a.s.

Pipeline Design • Room 108

OTC

5215 **Collapse of Deepwater Pipelines**
S. Kyriakides and M.-K. Yeh, U. of Texas

5216 **Unsupported Offshore Pipelines Spans: Design and Operational Considerations**
B. Shah, Lummus-Crest Inc., J.A. Mercier and C.N. White, Conoco Inc

5217 **Galloping of a Circular Cylinder Near a Plane Boundary**
A. Bokaian, Rice U

5218 **A New Lift Model and Response Analysis of Underwater Line Structures Subjected to Waves**
K. Yoshida, H. Suzuki, and N. Oka, U. of Tokyo

5219 **The Design and Construction of Stabilization and Protection of Subsea Pipelines and Cables Up to 600 m Water Depths**
A.G.M. Groothuizen, ACZ Marine Contractors BV

5220 **360 Tie-Ins in the Gulf: A Breaking Success**
A. Lupi, Comex

5221 **A Comprehensive Investigation of the Wave and Current Forces on Pipelines**
T. Sarpkaya, U.S. Naval Postgraduate School

Foundation Design and Behavior • Room 105

OTC

5222 **Measured Soil-Structure Interaction Properties of Gravity Platforms**
N. Spidsoe, SINTEF

5223 **Leg Penetration Monitor Systems to Avoid the Punch-Through Accidents of Jack-Up Rigs**
H. Tateishi and Y. Watanabe, Mitsui Ocean Development & Engineering Co. Ltd

5224 **Analysis of Existing Cyclic Vertical Load Tests for Piles in Clay**
J-L. Briaud, Texas A&M U.

5225 **Non-Linear Response of Laterally Loaded Piles in Stiff Clays**
T.G. Davies, U. of Glasgow, and M. Budhu, State U. of New York

5226 **Hydraulic Fracture Testing of Cohesive Soil**
R.F. Overy, McClelland Ltd., and A.R. Dean, BP Intl. Ltd

5227 **Case Histories: Pile Driving Offshore India**
D.M. Stockard, Fluor Engineers Inc.

Nonmetallic Materials • Room 100

OTC

5228 **Wireline Tracking Tests: Evaluation of Riser and Tubing Abrasion Resistance**
M.W. Joosten, Conoco Inc

5229 **Thermoplastic Rubbers in Offshore Operations**
C.P. Rader, R.D. Banning, and J.H. Muhs, Monsanto Polymer Products Co

5230 **Evaluation of Flexible Pipes Life Expectancy Under Dynamic Conditions**
J. Feret and C. Bournazel, Inst. Français du Petrole, and J. Rigaud, Coflexip

5231 **Improved Thermoplastic Materials for Offshore Flexible Pipes**
F. Dawans, Inst. Français du Petrole, T. Lefevre and M. Pelisson, Coflexip S.A.

5232 **Laminated Rubber Properties for Structural Offshore Applications**
F. Sedillot, Fluor-Doris Inc.; R. Monier, C.G. Doris; and A. Stevenson, M.R.P.R.A.

Marine Minerals and Mining II • Room 202

OTC

5233 **Cobalt-Rich Manganese Crust Potential of the U.S. Trust and Affiliated Territories**
A.L. Clark, Eastwest Ctr

5234 **Cobalt-Rich Ferromanganese Crusts From the Central Pacific**
J.R. Hein, F.T. Manheim, W.C. Schwab, and D.A. Clague, U.S. Geological Survey

5235 **Development of an Advanced Sampling Device for the Investigation of Marine Ferromanganese Crust Deposits**
J. Toth, Analytical Services Co.

5236 **Characterization of Seabed Rocks for Mine Planning in the EEZ**
M.J. Cruickshank, U.S. Geological Survey; S. Tandanand, U.S. Bureau of Mines; and R.G. Paul, Minerals Management Service

5237 **Derivation of Abundance Estimates for Manganese Nodule Deposits: Grab Sampler Recoveries to Ore Reserves**
H.F. Hennigar Jr., R.E. Dick, and E.J. Foell, Deepsea Ventures Inc.

5238 **Numerical Study of the Dynamic Behaviour of a Deep Sea Mining System Using Hydraulic Lift Concept**
C. Christian, Gemonod

Wednesday • 9:00 p.m. to 12:00 noon

API Offshore Standardization • Room 118

OTC
5239 **API Offshore Standards Activities: Equipment Quality**
J.D. Keasler, ARCO Oil & Gas Co.; K. Tunstall, Otis Engineering Corp.; and F.R. Gollhofer, American Petroleum Inst.

5240 **API Offshore Standards Activities: Wellhead and Christmas Tree Equipment**
F.J. Schuh, ARCO Resources Technology, and T.R. Sampson, American Petroleum Inst

5241 **API Offshore Standards Activities: Drilling Through Equipment**
R. Linenberger, Global Marine Drilling Co.; D.E. Pederson, Hydril Co., and T.R. Sampson, American Petroleum Inst

5242 **API Offshore Standards Activities: Subsea Production Systems**
B.C. Carlson, Shell Offshore Inc., and J.M. Spanhel, American Petroleum Inst

Completion Technology • Room 114

OTC
5243 **Design and Start-Up Guidelines for Thermal Fluid Heat Transfer Systems**
G. McIntyre, Dow Corning Corp.

5244 **Field Mixing and Filtration of Acid Stimulation Fluids**
L.R. Houchin, D.D. Dunlap, and L. Hudson, BJ-Titan Services Inc.

5245 **Underbalanced Perforation Characteristics as Affected by Differential Pressure**
J.A. Regalbuto, Jet Research Ctr. Inc.

5246 **A Computer Model for Gas Lift Value Performance**
K.L. Decker, Teledyne Merla

5247 **Oily Water Clean-Up by Dispersed Gas Flotation**
D.B. Rochford, Britoil plc; G.C. Dearden, Hunting Oilfield Services Ltd.; and T. Maguchi, Kawasaki Steel Corp.

5248 **New Concepts for Load Transfer in Threaded Connections**
K. Ueno, Kawasaki Steel Corp.

Offshore Terminals • Room 109

OTC
5249 **Deep Water Mooring Operations in the Gulf of Mexico**
C.E. Zumwalt, Western Oceanic Inc.

5250 **Design and Analysis of Turret Mooring Systems for Tanker Based Storage or Production Facilities**
J.W. Key, Offshore Production Systems Inc.; F.E. Shumaker and E.J. Theisinger, Alan C. McClure Assocs. Inc.; and B. Thompson, Offshore Production Systems Inc.

5251 **Weizhou Field, China: Permanent Mooring of a Process and Storage Tanker**
P. Mathieu, E.M.H. Systems Inc.

5252 **Offshore Petroleum Discharge System**
F. Apicella, U.S. Naval Sea Systems Command

5253 **A Rapid Deployment Tanker Loading System**
W.L. Kiely, Sofec Inc.

5254 **Lightweight, High Strength, Collapsible Pipeline for Use in Navy Fuel Systems**
L.A. Daniels, U.S. Naval Civil Engineering Laboratory

Offshore Platform Concepts • Room 108

OTC
5255 **Performance of the Lena Guyed Tower**
K.M. Steele, Exxon Production Research Co.

5256 **ROSEAU, A Deep Water Compliant Platform**
Y. Delepine, EMH; J. Gauvrit, Sofresid; and B. Andrier, ETPM

5257 **Topsides Weight Reduction Design Techniques for Offshore Platforms**
N.G. Boyd, Taylor Woodrow Offshore Ltd.

5258 **An Advanced Technology Cost Saving Jacket Design**
G.H.G. Lewis, John Brown Offshore Structures Ltd.

5259 **The Tern Platform: A New Generation Steel Jacket for the Northern North Sea**
G. Henderson and P.D. Wyatt, Shell U.K. E&P; and N.C. Bradshaw, Earl & Wright Ltd.

5260 **Offshore Installation of an Integrated Deck onto a Preinstalled Jacket**
G.J. White, Conoco (U.K.) Ltd.; F.A. Ramzan and P. Rawstron, Brown & Root (U.K.) Ltd.; and B.L. Miller, Global Maritime

Diving and Diver Tools • Room 105

OTC
5261 **Hydra V: Hydrogen Experimental Dive to 450 msw**
C. Gortan, Comex

5262 **Development of Underwater Construction Tools and Equipment for U.S. Navy Diver Use**
S.A. Black, B.W. Farber, H.G. Thomson, and A.T. Inouye, U.S. Naval Civil Engineering Laboratory, and W.R. Tausig, Eastport Intl.

5263 **Development of a Seawater Hydraulic Power Transmission System for Diver Tools and Related Underwater Activities**
I.M. Marr, Natl. Engineering Laboratory

5264 **Construction Diver Navigation System**
J.C. Miller, U.S. Naval Civil Engineering Laboratory

5265 **High Pressure Impingement Mixing Method for Foam-In-Salvage**
K.E. Alexander and J.R. Myers, Battelle Columbus Division, and B. Bloser, U.S. Naval Sea Systems Command

Corrosion and Corrosion Control • Room 100

OTC
5266 **Corrosivity of Heavyweight Brines: Understanding it and Techniques Operators Can Use to Control Corrosivity**
T. Hudson, Dowell Schlumberger

5267 **Corrosion Reduction in Production Tubing With the Aid of a Phase Equilibrium Model**
J.R. Reinhardt and T.S. Powell, U. of Southwestern Louisiana

5268 **Internal Corrosion Allowance For Marine**

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OTC '86

continued

Pipelines: A Question of Validity
R.T. Hill, J.P. Kenny & Partners, and P.C. Warwick, Conoco (U.K.) Ltd.

5269 **Corrosion and the Murchison Sea Water Injection System**
E. Buck, Conoco Inc., and J.S. Jones, Conoco (U.K.) Ltd.

5270 **Commissioning and Early Life Operation of the Hutton Tension Leg Platform Cathodic Protection System**
J.C. Vardon, Brown & Root (U.K.) Ltd.; G. Payne, Conoco (U.K.) Ltd., and A.D. Willis, Wilson Walton Intl. Ltd.

5271 **Crude Oil Tanker Corrosion vs. Offshore Platform Corrosion**
R.R. Dalton, Worth Testing Services Inc.

Cost Efficient Seismic Data Acquisition and Mapping • Room 202

OTC
5121 **A Discussion of Seismic Acquisition Specs: Example of Shot Noise from Other Crews**
K. Larner, Western Geophysical Co.

5122 **Is the Additional Cost of Improving the Resolution of 2D Seismic Data by Recording More Channels Currently Justifiable?**
W.C. Carmichael, C.D.T. Walker, and D. Chu, Geco Geophyscial Co. Inc.

5123 **Exploration 3D: A New Tool for Cost Effective Information for Offshore Prospects**
W. Ritchie, Geophysical Service Inc.

5124 **An Efficient 3D Marine Seismic Imaging Procedure**
P. Newman, Horizon Exploration Ltd.

5125 **Sediment Classification Using a Wideband, Frequency Modulated Sonar System**
L.R. LeBlanc and S.G. Schock, U. of Rhode Island

5126 **Interpolation and Processing of Non-Continuous Functions of Two Variables**
J. Sattlegger, Sattlegger Ingenieurbuero fuer angewandte Geoph.

Wednesday • 2:00 p.m. to 5:00 p.m.

General Session—Assessment of Offshore Project Technologies • Room 118

A panel of industry experts will focus on current-state-of-the-art developments in key offshore technology areas. Exploration, drilling, production, offshore operations, and transportation areas will be analyzed, and technical and operating challenges in each of the areas will be identified and discussed.

Seismic Processing • Room 114

OTC
5157 **Improvement of Multichannel Seismic Data Through Application of the Median Concept**
O.E. Naess, Statoil, and L. Burland, U. of Bergen

5158 **Dip Moveout and Pre-stack Imaging**
G.H.F. Gardner, S.Y. Wang, N.D. Pan, and Z. Zhang, U. of Houston

5159 **A Refraction Statics Technique Used to Remove**

Technical Session Timetable

● Monday Morning—9:00 a.m. to 12:00 noon
- Arctic Ice and Wave Forces
- Field Development
- Wave Forces
- Geotechnical Site Investigations
- Fracture Control
- Offshore Instrumentation: Power and Fiber Application
- Geophysical Interpretation

● Monday Afternoon—2:00 to 5:00 p.m.
- Historical Review
- Ice Mechanics
- Tubular Joints
- Wave Forces and Dynamic Response
- Pile Foundations
- Metallic Materials
- Seafloor Surveying and Mapping

● Tuesday Morning—9:00 a.m. to 12:00 noon
- Risers
- Rise of the ROV in Offshore Oil
- Wind and Wave Forces
- Exploration in Sedimentary Basins
- Lightweight Materials
- Satellite Applications
- Marine Minerals and Mining I

● Tuesday Afternoon—2:00 to 5:00 p.m.
- Project Development
- Mooring Forces
- Oceanography and Meteorology
- Pipeline Design
- Foundation Design and Behavior
- Nonmetallic Materials
- Marine Minerals and Mining II

● Wednesday Morning—9:00 a.m. to 12:00 noon
- API Offshore Standardization
- Completion Technology
- Offshore Terminals
- Offshore Platform Concepts
- Diving and Diver Tools
- Corrosion and Corrosion Control
- Cost Efficient Seismic Data Acquisition and Mapping

● Wednesday Afternoon—2:00 p.m. to 5:00 p.m.
- Project Technologies
- Seismic Processing
- Transportation and Seakeeping
- Arctic Structures
- Pipeline Analysis
- Structural Engineering: Design and Analysis
- Fatigue Performance

● Thursday Morning—9:00 a.m. to 12:00 noon
- Subsea Production Facilities
- Drilling and Production Technology
- Foundation and Platform Installation
- Structural Dynamics and Fatigue Design
- Pipeline Fabrication and Installation
- Health and Safety
- Welding and Fatigue

Static Problems Caused by South Timbalier Trench, Gulf of Mexico
P. Schatz, Professional Geophysics Inc.

5160 **Wiener-Levinson Deconvolution of Non-Minimum Phase Seismic Data**
R.L. Sengbush and S-T. Hu, Colorado School of Mines

5161 **Depths and Interval Velocities from Seismic Reflection Data for Low Relief Structures**
J. Sherwood, K.C. Chen, and M. Wood, Geophysical Development Corp.

5162 **Seismic Wave Attributes and Their Applications to VSP Interpretations**
B. Shapiro, Schlumberger Offshore Services

Transportation and Seakeeping • Room 109

OTC

5282 **Seakeeping Analysis of Self-Floating Steel Towers**
S.S. Sircar and E.J. Piermattei, Earl & Wright Ltd

5283 **Jacket Transportation Analysis in Multidirectional Waves**
R.G. Standing, British Maritime Technology Ltd.; and S.J. Rowe and W.T. Brendling, British Maritime Tech Ltd.

5284 **The Dynamics of a Jack-Up Transported in a Seaway**
W.G. Price, Brunel U.

5285 **Implementation and Use of a Large Scale Tow Monitoring System**
D.J. Wisch, Texaco U.S.A.; R.J. Stinner and C.R. Campman, Offshore Technology Corp.; and D. Kummer, Barnett & Casbarian Inc.

5286 **Jacket Transportation: Effects of Barge Ballast Distribution on Jacket Stresses and Fatigue Life**
J.C. Geagea, Chevron Corp.; R.A. Hayes, Brown & Root Inc.; R.A. Scharnell, PMB Systems Engineering Inc.; and Z.E. Zimmerman, Chevron Corp.

5287 **Dynamic Lifting Analysis of Offshore Structures**
K. Sekita, Nippon Steel Corp.

Arctic Structures • Room 108

OTC

5288 **A Review of the First Year of Operations With the Concrete Island Drilling System in the Alaskan Beaufort Sea**
R.A. Masonheimer, Exxon Co. U.S.A.; G.D. Knorr, Global Marine Drilling Co.; and F.H. Deily, Exxon Production Research

5289 **CIDS Construction and Mobilization to Antares Site**
G.W. Phillips, Global Marine Development Inc.; and A.C.T. Chen, Exxon Production Research Co.

5290 **CIDS Spray Ice Barrier**
H.O. Jahns and D.H. Petrie, Exxon Production Research Co.; and A.V. Lockett, Exxon Co. U.S.A.

5291 **MASS: A Mobil Arctic Structural System**
R.S. Winkler, Earl & Wright Ltd.; D.M. Coleman Mobil R&D Corp.; and G. Reusswig, Mobil Oil Canada Ltd.

5292 **Structural Behavior and Design Method of Steel/Concrete Composite Ice Walls for Arctic Offshore Structures**
Y. Nojiri and K. Koseki, Kajima Inst. of Construction Technology, and T. Yoshiki and M. Sawayanagi, Mitsui Engineering & Shipbuilding Co. Ltd.

5293 **Beaufort Sea Petroleum Technology Assessment**
D.V. Padron, Han-Padron Assocs.; K.W. Holman, Beaver Dredging Co. Ltd.; J.F. Nixon, Hardy Assocs. Ltd.; M.D. Macpherson, John J. McMullen Assocs. Inc.; W.M. Sackinger, U. of Alaska; and S.G. Sheps, SGS Consultants

Pipeline Analysis • Room 105

OTC

5294 **Buckling of Pipelines Covered by Backfill**
S. Boer, Delft Hydraulics Laboratory

5295 **Design Procedures of Partially Buried Submarine Pipelines**
N.M. Ismail, N.R. Wallace, and R. Nielsen, Bechtel Inc.

5296 **Analytical Treatments for Submarine Pipelines of Large Diameter**
M.R. Vora and R.D. Haun, Fluor Engineers Inc.

5297 **3-D Static Analysis of Pipelines During Laying**
P.T. Pedersen and Y. Junqui, The Technical U. of Denmark

5298 **Analysis of Ice Gouge Hazards**
G.A. Lanan, Intec Engineering Inc.; A.W. Niedoroda, R.J. Brown & Assocs.; and W.F. Weeks, Gold Regions Research & Engineering Laboratories

5299 **Thaw Subsidence Model Study**
J.M.E. Audibert and S.R. Bamford, Earth Technology Corp.

Structural Engineering, Design and Analysis • Room 100

OTC

5300 **Joint Industry Project: Deepwater Fixed Steel Tower for North Sea**
S.L. Fu, Chevron Oil Co.; J. Anderson, Britoil Ltd.; A.G. Bouquet, Norske Shell; O.T. Gudmestad, Statoil; and E.J. Piermattei, Earl & Wright Ltd.

5301 **A Parametric Study on Increasing the Economical Water Depths for Deepwater Fixed Platforms**
D.I. Karsan and J.B. Valdivieso, Brown & Root Intl. Inc.

5302 **Collapse Analysis of Framed Offshore Structures**
T.H. Soreide, J. Amdahl, O.C. Astrup, and T. Granli, SINTEF

5303 **Dynamic Analysis of Marine Structures: Comparison Between Time Domain and Frequency Domain Analyses**
G. Deleuil and L. des Deserts, C.G. Doris, and A. Shive, Fluor-Doris Inc.

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5304 **Wave Dynamics of Jack-Up Rigs**
K.G. Grenda, Exxon Production Research Co.

5305 **A Design Procedure for Catamaran Cross Structure Loads**
R.P. Dallinga, Maritime Research Inst. Netherlands

Fatigue Performance • Room 202

OTC

5306 **Improved Fatigue Life Estimation of Tubular Joints**
M. Lalani and I.E. Tebbett, Wimpey Offshore Engineers & Constructors Ltd.

5307 **The Fatigue Strength of Grouted Repaired Tubular Members**
L.F. Boswell and C. D'Mello, The City U., London

5308 **Experimental and Analytical Studies on Fatigue and Crack Propagation of Stiffened and Unstiffened Tubular T-Joints**
A.S.J. Swamidas, Memorial U. of Newfoundland

5309 **Size Effect in Fatigue of Large Scale Plate Girders**
O.I. Eide, Sintef, and S. Berge and T. Moan, The Norwegian Inst. of Technology

5310 **New Data on the Fatigue Performance of Cast Steel Tubular Joints**
I.E. Tebbett, Wimpey Offshore Engineers & Constructors Ltd.; D.C. Hurden, Conoco (U.K.) Ltd.; and A. Wood, Wimpey Offshore Engineers & Constructors Ltd.

5311 **Corrosion Fatigue Strength of 350MPa Class High Strength Steels Produced by Thermo-Mechanical Control Process**
T. Junichiro, H. Michihiko, K. Yutaka, N. Asao, and M. Shigeto, Kawasaki Steel Corp.

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OTC '86

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Thursday • 9:00 a.m. to 12:00 noon

Subsea Production Facilities • Room 118

OTC

5312 **Subsea Production Systems Availability Assessment**
O J Granhaug, Esso Norge a/s, E&P

5313 **Success and Failure: Subsea Completions**
D S Hammett and J M Luke, Sedco Forex

5314 **Central Cormorant Underwater Manifold Centre 4 Years on: A Review of Operational Experience**
D A Price, Shell U K E&P

5315 **The Cobia-2 Subsea Satellite Experience**
B C Volkert and M N Shaw, Esso Australia Ltd

5316 **Diverless Lay-Away Flowline Connector System**
M Williams, FMC Corp., and B C Hopkins and H B Skeels, FMC Corporation

5317 **Low Cost Multiple Well Caisson Used in Mudslide Area**
G A Mannina, J Jordan, and D B Autin, Exxon Co U S A

Drilling and Production Technology • Room 114

OTC

5318 **Experience With Electric Submersible Pumps for Testing Heavy Oil Reservoirs From Floating Drilling Vessels**
E G Crossley, Phillips Petroleum Co

5319 **Application of DC Motor Drives to an Offshore Production Platform**
R H Hicks, Exxon Co U.S.A

5320 **A New Deepwater Exploration Template Drilling System to Accommodate Early Production Platform Tieback**
B Hopkins and B Skeels, FMC Corp.

5321 **The Development of a Severe Environment Dynamically Positioned Drillship**
R W Bos, Gusto Engineering C.V., and O N Olsen, Helmer Staubo & Co

5322 **Evaluation of Hydraulic BOP Controls for Deep Water Application**
E S B Stidston and C Boulet, Sonat Offshore Drilling Inc

5323 **Hammerhead 1985: Experience With Drillship Operations in the US Beaufort Sea**
S Thibodeaux, Union Oil of California, and A Hippman, Canadian Marine Drilling Ltd

Foundation and Platform Installation • Room 109

OTC

5324 **Design and Installation of a Large Scale Piled Foundation in Rock**
L J. Shear, McDermott Engineering London; P.C. Charlesworth, McDermott Intl. Inc.; and I.J. Redfern, McDermott Engineering London

5325 **Full Scale Testing and Analysis of Prestressed Grouted Pile/Platform Connections**
A.S. Elnashai, Wimpey Offshore Engineers & Constructors Ltd.; B.C. Carroll, Earl & Wright Ltd; P.J. Dowling, Imperial College of Science & Technology; and C.J. Billington, Wimpey Offshore Engineers & Constructors Ltd

5326 **The Effect of Deep Water on the Performance of Slender Underwater Hammers**
C. Van Zandwijk, Heerema Engineering Service B.V.

5327 **TLP Foundation Design and Installation for 2000 to 4000 Ft. Water Depths**
J.E. Lacy, C.M. Crull, and D.M. Stockard, Fluor Engineers Inc

5328 **Grouted Section Texts in Calcareous Soils**
W.M. Lewis, Esso Australia Ltd

5329 **Installation of the Gaviota Platform Foundation**
J.L. Santiago, A.G. Fragio, and J.A. Mingo, ENIEPSA, and P. Charlesworth, McDermott Intl

Structural Dynamics and Fatigue Design • Room 108

OTC

5330 **Wave Cancellation Effects and Extreme Wave Dynamics**
S.Y. Hanna, Conoco Inc

5331 **Simplified Fatigue Design Procedure for Offshore Platforms**
J.F. Geyer and B. Stahl, Amoco Production Co

5332 **Stochastic Fatigue Response of Jackets Under Intermittent Wave Loading**
A. Haldar and H.B. Kanegaonkar, Georgia Inst. of Technology

5333 **Spectral Fatigue of Broad Band Stress Spectrums With One or More Peaks**
G. Chaudhury, John Brown Engineers & Constructors Ltd

5334 **Extreme Response and Fatigue Damage Estimates in a Deep Water Platform Exposed to Non-Linear Wave Loading**
K. Syvertsen, The Norwegian Inst. of Technology

5335 **Fatigue Assessment of Concrete Structures Based on In-Service Responses**
Y.J. Doucet, Societe Nationale Elf Aquitaine, J. Thebault, Elf Aquitaine Norge a.s., and J. Trinh, C.E.B.T.P.

Pipeline Fabrication and Installation • Room 105

OTC

5336 **Fabrication and Installation by Means of a Reel Barge of Thermally Insulated Flowlines**
H. Vastenholt, Shell U.K. E&P, and B. Wadie, Shell Research Ltd

5337 **Offshore Pipeline Construction by a Near Surface Tow in Chengbei, China**
M. Tatsuta and H. Okubo, Nippon Steel Corp., and H. Okada, CORVAC Corp

5338 **Full Scale Pipe-Soil Interaction Tests**
H. Brennodden, SINTEF, O. Sveggen, Statoil, and D. Wagner and D. Murff, Exxon Production Research Co

5339 **Spoilers for Stimulated Self-Burial of Submarine Pipelines**
C.H. Hulsbergen, Delft Hydraulics Laboratory

5340 **Subsea Trench Infill**
A.W. Niedoroda, R.J. Brown & Assocs., and A.C. Palmer, consultant

5341 **The Soil Mechanics of Submarine Ploughs**
A.R. Reece and T. Grinsted, Soil Machine Dynamics Ltd

Health and Safety • Room 100

OTC

5342 **A New Health Care System for the Offshore Oil Industry**
T.M. Hall, Medical Advisory Systems Inc

ARMATURENFABRIK ERNST HORN GMBH	7742
ARNICA	7637
W B ARNOLD CO INC	4038
ARROWHEAD CONTINENTAL	4650
ARROW OIL TOOLS, INC./TECHNOLOGY EXPORT CO	8435
ASCO ENGINEERING	7431,7449
ASEA HAGGLUNDS, INC	4545
ASSOCIATION OF BRITISH OFFSHORE INDUSTRIES	7431,7449
ASTEO	5011,5013
ASTILLEROS ESPANOLES, S A	4475
ATLANTIA	5456
ATLAS DANMARK A/S	5303
AUSTRIAN TRADE COMMISSION	8021,8115
AUTOCON, INC	5006
AUTOKON DATA A/S	5233,5249
AUTOMATED FLUID SYSTEMS	4301
AUTOMATIC POWER, INC	7119
AVA INTERNATIONAL	8143
AVESTA PROJECTS	4055,4065
AXELSON, INC	8641
B C MANUFACTURING, INC	9604
BADGER MINING CORP	6078
BALDOR ELECTRIC	5383
BALDT INC	5395
BAND-IT HOUDAILLE	5665
BARDEX HYDRANAUTICS	4531
BARTON VALVE CO , INC	8849
BASSIN D ESSAIS DES CARENES	5085
BAY SHIPBUILDING CORP	7321
BAYLEYSUIT INC	4143
BAYLOR CO	4505
BEAUDRIL LTD	7037,7049
BECHTEL, INC	5153
BEEBE INTERNATIONAL, INC	4419
MIKE BEELER OIL CO	7637
BELGIAN FOREIGN TRADE OFFICE	7349
BELL HELICOPTER TEXTRON, INC	8715
BELLELI	8153
BELLSHILL ENGINE SALES LTD	7683

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5343 **Assessment of Pipeline Reliability Under the Existence of Scour Induced Free Spans**
E.N. Larsen and H.O. Madsen, Det norske Veritas

5344 **Large Bore Flexible Hose Lifetime Prediction**
P. Cox, Dunlop Ltd

5345 **The In-Service Measurement of Hydrostatic Stability**
M.S. Bradley, Michael Bradley & Assocs., and C.J. MacFarlane, BP Intl. Ltd

5346 **Some Notes on Heavy Lift Design**
J.G. Mayfield, Lowell Johnston & Assocs. Inc.

5347 **Open-Sea Terminal in Hostile Environment**
B. Koman, Soros Assocs.

Welding and Fatigue • Room 202

OTC

5348 **Important Considerations for Successful Fabrication of Offshore Structures**
T. Doody, Conoco Inc., and M.M. Salama, Conoco Inc.

5349 **Deep Water Pipeline Welding Specifications**
R.A. Teale, Brown & Root Intl.

5350 **Effect of Pinholes and Stress Relieving on the Behavior of Short Tubular Columns**
J.W. Larson, Bethlehem Steel Corp.

5351 **Analysis Methods and Inspection Procedures for Single Sided Closure Welds in Offshore Structures**
R. Guy, E. Heshmati, and G. Lewis, John Brown Offshore Structures Ltd.

5352 **The Calculation of Fatigue Crack Growth in Welded Tubular Joints Using Fracture Mechanics**
D.R.V. van Delft, Delft U. of Technology, and O.D. Dijkstra and H.H. Snijder, IBBC-TNO

5353 **Fatigue of Circumferential Cracks in a Semisubmersible**
B.G. Wade, Earl & Wright

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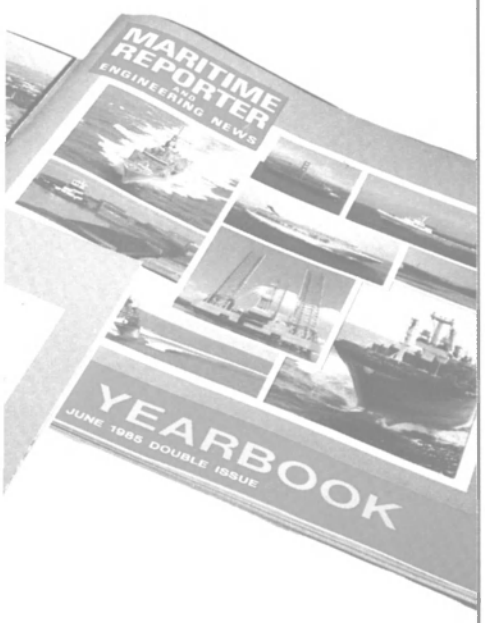

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BUYERS	21,609 89%	15,107 60%	2,347 34.2%	?
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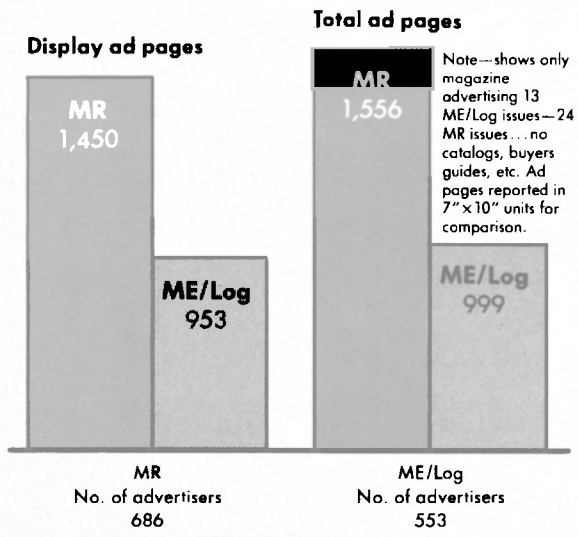

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Avondale Gets $101-Million Award From Navy For Sixth T-AO-187 Oiler

The U.S. Navy has exercised an option in its contract with the Shipyards Division of Avondale Industries, Inc. for the construction of another fleet oiler of the T-AO-187 (Henry J. Kaiser) Class. This latest award, worth $101 million, brings to six the number of-oilers building or under contract at the Avondale yard, at a total cost $689.9 million. Under the current contract, the Navy has an option on a seventh ship of the class. Delivery of the sixth oiler is scheduled for January 1989.

Avondale Industries, headquartered in Boston, is an employee-owned company comprising seven divisions recently purchased from Ogden Corporation. Avondale is primarily involved in marine and modular construction, metals recycling, and industrial production. With 1985 sales of $1.2 billion, Avondale is among the largest employee-owned corporations in the U.S.

Ameron Torpedo Introduces Versatile, Chemical-Resistant Tank Lining

A new high-solids, modified phenolic epoxy tank lining system has been added to the standard range of conventional and high-performance marine coatings available from Ameron Torpedo Marine Coatings. Amercoat® 346 is a versatile tank lining said to offer excellent chemical resistance to solvents, caustic, crude and fuel oils, animal and vegetable oils and fats, and neutral, alkaline, and non-oxidizing salt solutions in water.

Amercoat 346 is also resistant to fruit juices, salt solutions, molasses, and diluted residues of molasses provided the pH of these products is between 4 and 11. Of special importance is its suitability for the transportation of methanol. Fully approved by Lloyd's Register of Shipping, the epoxy system is a tough and durable tank lining, providing good resistance to extremes of wear and abrasion.

Hot Butterworth cleaning at a maximum temperature can be performed on this tank lining as necessary to avoid contamination between different types of cargo. However, the lowest practical cleaning temperature should normally be used to extend coating life.

The Amercoat 346 is applied in three coats of 4 mils (100 microns) dry film thickness each, in sequential colors of light gray, dark gray, and light gray for wear monitoring. Its high-solids formulation is designed for economy of application and minimum materials consumption, using standard airless or conventional spray equipment.

Shown here after three years of user-trial service on Rowbotham Tankships' products carrier Echoman, the Amercoat 346 lining is in very good condition.

This new addition to the comprehensive line of more than 200 conventional and high-performance marine coatings is sold through the international network of Ameron Torpedo Marine Coatings' agents, licensees, and representatives. This network now includes more than 50 companies in more than 40 countries, including the U.S. and important European and Far East locations.

For further information and a copy of a product resistance list from Ameron Torpedo Marine Coatings, detailing the extensive range of chemicals for which Amercoat 346 is applicable,

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6th Lips Propeller Symposium Set For Netherlands In Mid-May

The 6th Lips Propeller Symposium will be held May 14-16, 1986, at the Congress Centre "Koningshof" in Veldhoven, the Nether lands.

The theme for the upcoming symposium is "Cost-Effective Propulsion," with notable guest authors giving presentations that cover the latest developments in fuel saving technologies. Past Lips Propeller symposiums have been structured toward technical propulsive developments, but the papers of the 6th symposium will be orientated toward vessel owners and operators.

All questions regarding the symposium should be directed to **Franz Bult,** Lips B.V.—The Netherlands (011-31-416388-115).

The timetable for the 6th Lips Propeller Symposium is as follows:

Wednesday, May 14, 1986

2 p.m., Visit to Lips Plant, Drunen; 4 p.m., Departure of bus to Congress Centre; 4 p.m., Registration; 6 p.m., Opening Ceremony; 6:15 p.m., Announcements; and 6:30 p.m., Cocktail Party.

Thursday, May 15, 1986

8:45 a.m., Registration; 9:15 a.m., Word of welcome by **J. Romsom,** president, Lips United B.V.; 9:25 a.m., Announcements; 9:30 a.m., Introduction by the chairman, Prof. dr **J.D. van Manen,** president MARIN (N.S.M.B.) Wageningen, the Netherlands.

First Session

9:40 a.m.—Paper No. 1, "Launching the Queen Elizabeth 2 into the 21st Century," (a) **S.M. Novak,** Cunard Line Ltd, USA; **P.W.C.M. van Oirschot,** Lips B.V., the Netherlands; (b) **T. van Beek,** Lips B.V., the Netherlands.

10:45 a.m.—Paper No. 2, "Wake Equalizing Duct, State of Development, **H. Schnekluth,** Technical University, Aix-la-Chapelle, West Germany.

11:15 a.m.—Paper No. 3, (a) "Modern Ship Propulsion Systems, Lay-out of Prime Mover-Power Transmission-Propeller," **W. Oehlers,** MAN-B&W, Augsburg, West Germany; (b) "Optimization of a Propulsion System With Controllable Pitch Propeller for a RO/RO Vessel at Reduced Speed," **M. Dubourg,** Navale et Commerciale Havraise Peninsulaire, France; and (c) "Icelandic Experience to Convert Fishing Vessels to Achieve Fuel Saving," **O. Eiriksson,** Iceland.

12:45 p.m.—Lunch

Second Session

2 p.m.—Paper No. 4, "Overlapping Propellers," **K.S. Min,** Daewoo Shipyard, Korea.

3:15 p.m.—Paper No. 5, "Computerized Propulsion Control," **R. Verbeek** and **A. Wesselink,** Lips B.V., the Netherlands.

4 p.m.—Paper No. 6, "Monitoring the Service Performance of Propellers and Propulsion Devices," **M.F. Osborne,** Shell International Marine, U.K.

Friday, May 16, 1986

Third Session

9:30 a.m.—Paper No. 7, "Factors Influencing the Design of Aircraft Propellers," **R.M. Bass,** Dowty Rotol Ltd., U.K.

10:15 a.m.—Paper No. 8, "The Effects of Propeller Roughness on Ships' Performance," **B.R.I. Luttmer,** MARIN (N.S.M.B.), the Netherlands.

11:30 a.m.—Paper No. 9, "Crabbing Performance of Ferries," **C.M. van Hooren,** van der Giesen-de Noord, Shipbuilding Division, the Netherlands; **J.M. Huisman,** Nedlloyd Fleet Services, the Netherlands.

12 noon—Lunch

Fourth Session

1:30 p.m.—Brain-Wave Session: Open Discussion. The discussion is steered by **Anthony Fudge,** Amsterdam-based British communication consultant. General introduction by the chairman, Prof. dr. **J.D. van Manen.** The audience is encouraged to participate.

Subject No. 1, "Scale Effect in Test Results of Propellers and Fuel Saving Devices"; Subject No. 2, "Two- and Three-Bladed Propellers for Large Powers"; Subject No. 3, "Fuel Saving Propellers and Devices at Large"; and Subject No. 4, "Cost Aspects of Effective Propulsion."

4 p.m.—Final remarks and conclusions

4:15 p.m.—End of Sessions

6 p.m.—Cocktails

7-9:30 p.m.—Closing Dinner

Voigt Shipping Reorganizes —Elects Nick G. Koutroulis President Of Renamed Firm

F.A. Voigt & Company B.V. of Rotterdam has purchased all outstanding shares of Houston-based F.A. Voigt shipping Company, and has reorganized and renamed the firm Voigt & Koutroulis Shipping Company. The changes were announced by Voigt chairman of the board **Wieger J. de Ruiter**.

Nick G. Koutroulis, formerly executive vice president of F.A. Voigt Shipping Company, has been elected president of Voigt & Koutroulis and will be a minority shareholder of the new company. For the past three years, he has been in charge of Voigt's overall shipping operations in the U.S. Voigt & Koutroulis will establish its principal office in Houston, with several additional offices planned.

Voigt & Koutroulis Shipping Company will specialize in liner agency services, along with chartering, ship brokering, and husbanding.

East Asiatic Limited-Trans Pacific Service, Frota Amazonica, Frota Oceanica, Sudan Lines, South Seas Steamship Lines, and a number of bulker and tramp services are represented by Voigt & Koutroulis. Negotiations are underway for additional liner services.

Voigt & Koutroulis Shipping Company is headquartered at 2190 North Loop West, Suite 103, Houston, Texas 77018, telephone (713) 957-3445; telex number is 794234.

Alsthom Awarded Order To Build Two Dredges For Mexican Government

Alsthom of France confirms that a protocol was signed in Mexico City recently for the constructin of two 4,000-cubic-meter dredges for the Mexican Maritime Authority. These dredges are to be built by Alsthom shipyards in the Loire-Atlantic, notably to Dubigeon in Nantes. This protocol puts into effect the financial protocol signed last year by the governments of Mexico and France for that purpose.

Marangiello Elected Chairman of ASTM Shipbuilding Committee

Daniel Marangiello

Daniel A. Marangiello, executive scientist at ORI, Inc., has been elected to a two-year term as chairman of the Shipbuilding Committee (F-25) of the American Society of Testing & Materials. The prime job of this committee is to develop non-government specifications and standards to replace Mil Specs and Standards where possible.

After attending Harvard College for two years, Mr. **Marangiello** attended the U.S. Naval Academy and graduated in 1951. He earned an MS degree in naval engineering from MIT in 1956. He served in the Navy from 1951 to 1966, with sea duty in surface ships and submarines, and shore assignments in both public and private shipyards, as well as other line and staff assignments in Washington and field activities as a qualified engineering duty officer.

In 1967-69 he was manager-naval architecture at Westinghouse Electric Corporation. In 1969 he became deputy director of the Naval Sea Systems Command, where he was civilian director of 115 engineers, technicians, and clerical personnel, and had total responsibility for the maintenance, modernization, and technical and logistic support of all U.S. Navy submarines. He joined ORI in 1984, and is currently executive director of the Marine Machinery Association.

Perkins Engines Names Howsmon New President

Roger Howsmon

Roger L. Howsmon has been named as the new president of Perkins Engines, Inc., a major supplier of diesel engines in the U.S. and Canada and part of the worldwide Perkins Engines Group based in Peterborough, England.

The announcement was made by **John F. Devaney,** managing director of the Perkins Engines Group, which is a major division of Massey-Ferguson, Ltd., of Toronto, Canada.

Mr. **Devaney** said that Mr. **Howsmon** joins Perkins at a time when the company is dramatically increasing its North American operations. Perkins, which has long been the dominant supplier of diesel engines in the 51 to 300-horsepower range in the U.S. and Canada, recently expanded its product line to range from 3½ to 1,200 horsepower.

The expansion includes the acquisition of the former Rolls-Royce Diesel Engine Division product line, which was introduced into North America last year.

Mr. **Howsmon** joins Perkins from Cummins Engine Company's largest independent distributorship in North America, Cummins West Inc., based in San Francisco, Calif., where he was vice president, marketing.

He was educated at Miami University in Oxford, Ohio, where he obtained a Bachelor of Science degree in Business Administration. He was also a captain in the United States Air Force before joining Cummins Engine Company in 1971.

During his business career he held a number of sales and marketing positions with Cummins and was a corporate vice president, sales and service for North America prior to his appointment in 1983 as vice president-marketing, Cummins West, Inc.

As president of Perkins Engines, Inc., Mr. **Howsmon** will be responsible for the further development of Perkins's interests in North America and Canada. Since its formation in 1960, Perkins, based in Wayne, Mich., has become a leading supplier of light and medium-duty diesel engines, and today there are more than one million Perkins engines in operation in the U.S. and Canada.

He succeeds **Bill Winemaster,** who recently retired from Perkins Engine, Inc. Mr. **Winemaster,** after spending over 25 years with Perkins, the last 12 as president, is launching a new Perkins distributorship in the Great Lakes area.

The Perkins Engines Group is world leader in the design and manufacture of diesel engines. The company reached a milestone late last year, becoming the first diesel engine manufacturer to produce 10 million engines. It engines are manufactured or assembled in 16 countries of the world and sold in more than 160. Total worldwide production of Perkins engines is around 400,000 a year.

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American United Marine To Represent World Water Systems In U.S. Northeast

World Water Systems, Inc. (WWS), Tustin, Calif.-based manufacturer of oil/water separators and related equipment recently announced the appointment of American United Marine Corporation (AUM) as its representative in the Northeast section of the United States.

American United Marine is located at 5 Broadway, Route 1, Suagus, Mass. 01906, telephone (617) 231-0622.

WWS manufactures the worldwide approved Heli-Sep Oil Water System to meet the current 73/78 requirements.

For further information,

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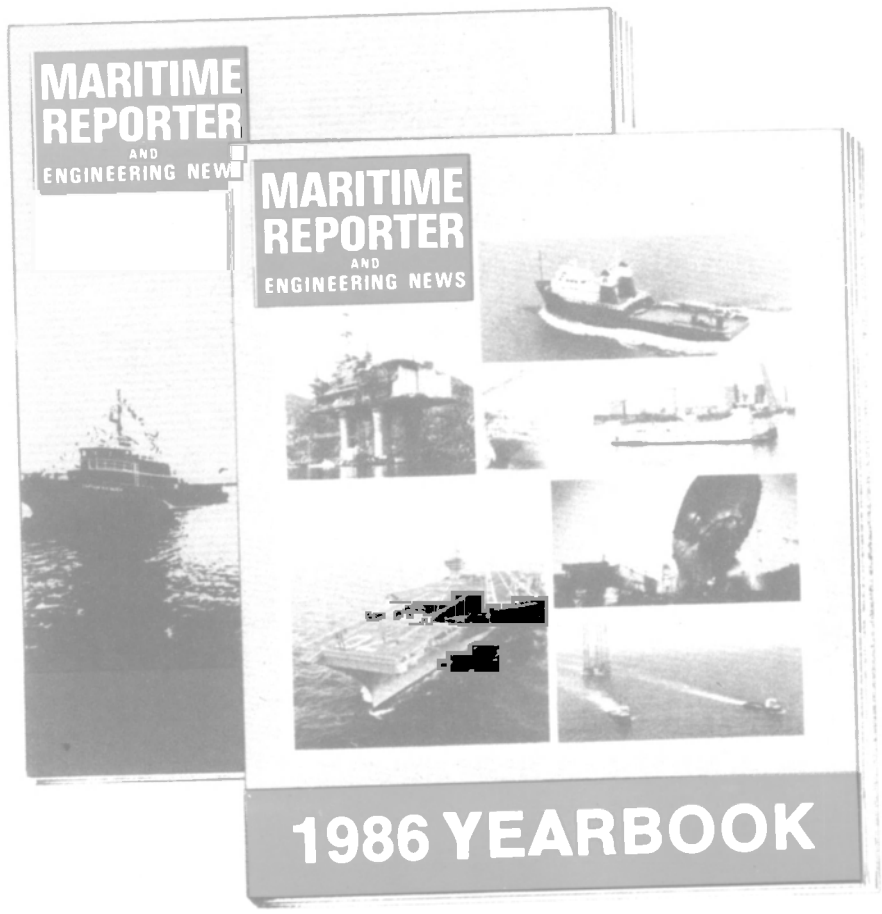

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- **U.S. SHIPBUILDING REPORT AND OUTLOOK —** Vessels building or on order in U.S. shipyards plus the outlook for the future.
- **U.S. NAVY —** A complete report — The present size and future prospects for a larger, more formidable U.S. Naval Fleet.
- **WORLDWIDE SHIPBUILDING OUTLOOK —** A view toward future ship construction levels in leading foreign yards.
- **OFFSHORE DRILLING —** The current picture on new rig and support-vessel activity plus estimations of future trends by key industry leaders.
- **U.S. INLAND WATERWAYS —** Predictions for the future in detail provided by leading experts on shallow-draft vessel operations and tug, towboat and barge construction.

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PROPULSION UPDATE

Cummins Engine Offers Two New Catalogs

—A Marine Engine Catalog And A Passenger Vessel Brochure

Cummins Engine Company, Inc. has announced the availability of their new Marine Engine Catalog, bulletin number 3382488, to provide a current compilation of their entire marine propulsion engine and auxiliary generator set and generator engine product line.

All the "need-to-know" information is included. Main propulsion design features are listed, followed by complete specifications for eight marine engine families: B, 504/555, 903, 855, V28, K19, K38, and K50. The specifications listing includes dimensions, weight, marine gear, compression ratio, engine power output and speed, B.M.E.P., and fuel consumption data. Also listed is the various optional equipment available from Cummins.

Auxiliary/G-Drive engines and generator sets are also featured consisting of six engine families that range from 37 to 925 kw (60 hz). Complete specifications and optional equipment lists are also included.

For further information and a free copy of the Marine Engine Catalog,

Circle 10 on Reader Service Card

Cummins also recently published a new brochure, "Cummins Marine—Proven, Reliable Passenger Vessel Power." The new brochure, bulletin number 3386682, highlights some recently launched passenger vessels powered by Cummins diesel engines. Many of the featured vessels are also equipped with Cummins Marine auxiliary engines and/or generator sets.

The brochure points out some of the unique designs of various paddlewheelers and excursion vessels and notes their designer, builder and owner.

Complete engine specifications for Cummins main propulsion, generator set and G-drive engines are also listed including dimensions, weight, BHP at rated speed, kw, and fuel consumption data.

For more information and free copies of the new brochure,

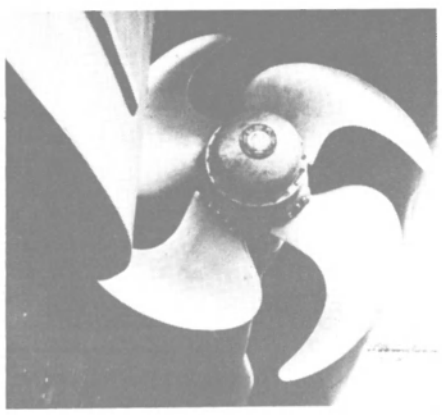
Circle 11 on Reader Service Card

New Or Modified Blades Improve C-P Propeller Performance

As early as the 1950s, controllable-pitch propellers accounted for a substantial and steadily growing share of the propeller market worldwide. KaMeWa AB in Sweden claims to hold some 30 to 50 percent of today's CPP market, and has delivered to date more than 4,000 C-P propellers. Most of these are still in operation.

The development of propellers and auxiliary equipment has made progress which can be applied to old ships to save fuel and/or improve performance.

During the 60s and 70s, many ships were built with propulsion machinery and propellers adapted to higher outputs and speeds not considered economical today. Most of these ships are now operated at reduced ship speed and power. In general, the propellers no longer produce the highest possible efficiency given these altered conditions.



A modern highly skewed KaMeWa controllable-pitch propeller.

Since 1978, KaMeWa has delivered some 250 propellers with highly skewed blades. Most of these were for newbuildings, but about 20 percent were for retrofits—replacing existing blades of conventional design.

The high-skew blades are characterized primarily by their low vibration impulses. As a rule, the HS propeller will result in vibration levels in the hull only 30-50 percent of the levels occurring with conventional blades. Despite this very low excitation level, the HS blades yield propeller efficiencies equal to those of conventional propellers.

Because of low vibration impulses, accompanied by an improved comfort level in ship's accommodations, HS propellers are fast becoming standard for all types of passenger ships as well as naval ships where low noise and vibration levels are vital.

In all cases when the old conventional propeller blades have been replaced by new HS blades, vibration and noise levels are reduced.

For a copy of the complete report and free literature on KaMeWa propellers,

Circle 93 on Reader Service Card

In many cases, considerable fuel savings can be achieved by modifying the propeller blades or by replacing the existing blades with new ones optimized for the new operating conditions. Among alterations that may be considered are the following:

• Reduction of the propeller diameter

This may be considered for geared medium-speed machinery where the number of engines utilized per shaft has been reduced, where one engine per shaft is used instead of two, two instead of three, etc.

• Increased propeller diameter

An increase in diameter may be considered if the new and reduced power can be utilized at the shaft speed that is reduced more than corresponding to the cubic root of the power ratio (Pn^3="propeller law"). This condition may often apply for plants with directly coupled, low-speed diesel engines. To prevent propeller-induced vibration from increasing due to reduced tip clearance, blades of the highly skewed type may be considered.

• Reduction in blade area and/or thickness

Such reductions contribute to increased propeller efficiency by reducing friction between the water and the blades. In most cases where propeller power is reduced, blade area may also be reduced without risk of harmful cavitation.

• Changes in radial pitch distribution and/or blade section camber

These alterations may be considered, in combination with some of the changes discussed above, if the original blades are operating with an unfavorable load distribution.

Highly Skewed Blades

For severe propeller-induced vibrations, propeller blades of the highly skewed type are recommended. These blades yield vibration levels that are only 30-50 percent of those experienced with conventional blade designs.

EDO Awarded $15 Million Navy Contract For Towed Array Sonar Systems

EDO Corporation has been awarded a $15.2-million contract by the Naval Sea Systems Command for the production of SQR-18 Tactical Towed Array Sonar Systems (TACTAS) and ancillary support items. The contract will be performed at EDO's Government Systems Division located in College Point, N.Y. It contains options for additional quantities valued at approximately $20 million, which are expected to be exercised during the current calendar year.

This latest in a series of production contracts is for improved SQR-18A V(1) and SQR-18A V(2) TACTAS. These systems will have significant improvements in operator aids and combat system integration that will further increase the effectiveness of this critical anti-submarine warfare sensor.

PROPULSION UPDATE

Caterpillar Announces New Marine Diesel Propulsion System Support Programs

Caterpillar Marine Support Programs Help Lower Operating Costs

Engine parts and service support for Caterpillar Marine Systems is available through a network of more than 300 marine-oriented dealer locations servicing more than 1,000 ports worldwide.

With Caterpillar-controlled design, build, and test for the complete marine engine, transmission or generator, single source service and warranty for the entire system is available. According to **Mike Rose,** Caterpillar Engine Division Marine national accounts manager, "Cat wants to be your partner in lowering the cost of doing business. Our goal is to help operators obtain more profits by improving marine system availability and lowering operating costs. Cat product support programs are designed to help operators manage their businesses."

Once the marine system is installed, competitively priced, genuine replacement parts and quality service are available dockside or underway as needed. Cat service personnel use both the latest diagnostic tooling and repair techniques to quickly get you back underway. Maintenance management programs are available which let you project what your costs will be. For owners wanting to perform their own maintenance, convenient repair kits are available. Numerous repair options, exchange parts, remanufactured parts priced at 10 to 60 percent of new but with same-as-new warranty are available. Plus, a parts availability guarantee program covers the engine, transmission, generator and selected Twin Disc transmissions. About 98 percent of the parts ordered can be filled immediately over the counter. If you must wait more than 48 hours for the necessary repair part, the part is free.

Make Sure You Get and Retain the Value Purchased

The Caterpillar Marine Performance Analysis Report (Marine PAR) is an in-vessel test procedure that uses the latest diagnostic equipment. The test examines both individual components and the interface of engine, transmission, prop, keel cooler, air and lubrication systems. Offered exclusively by Caterpillar Marine Dealers, the test determines if systems and components are properly matched for optimum life, fuel economy and performance. Operators are given a computer printout and analysis of vessel performance, propeller and marine transmission match to the engine, and compatability or mismatch readout of specific engine systems. In addition, Marine PAR will help detect damaged propellers and rudders as well as cooling system deterioration and fouled hulls.

Caterpillar advises the test be ap-

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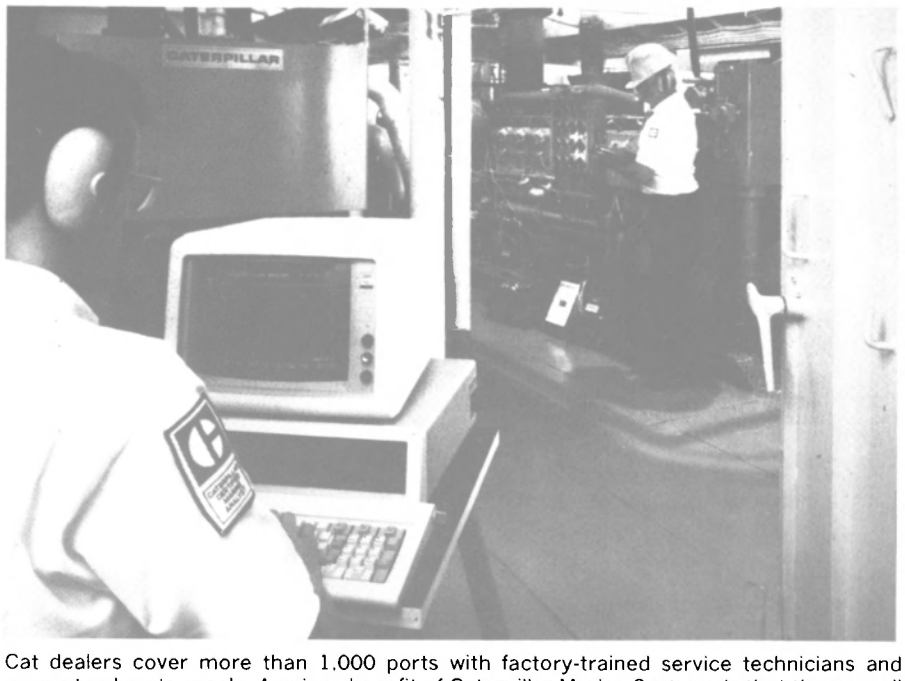

Cat dealers cover more than 1,000 ports with factory-trained service technicians and quaranteed parts supply. A unique benefit of Caterpillar Marine Systems is that they are all supported by a single source. If a problem should ever occur, the operator never doubts who has support responsibility for warranty and service.

Princess Cruises-They Don't Set Sail Without

TEXACO

Lubricants and Marine Services

★ Texaco quality lubricants help insure efficient trouble-free operation.

★ Texaco prompt deliveries help insure that the most demanding sailing schedules are met.

★ Texaco rapid lubricant analysis program helps insure optimum engine performance.

★ Texaco marine engineers provide on-the-spot technical advice and assistance world wide.

Whether your ships operate on a precise timetable-like the M/V Pacific Princess and the M/V Island Princess-or on a less exacting schedule...

Don't Set Sail Without Texaco Marine Products and Services — Available World Wide

Texaco Inc.
International Marine Sales Dept.
2000 Westchester Ave.
White Plains, NY 10650
Phone: (914) 253-4000

Texaco Ltd.
International Marine Sales Europe
1 Knightsbridge Green
London SWIX 7QJ
Phone: 01-584-5000

Caterpillar

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plied during sea trial and then later used as a benchmark for problem diagnosis. The cost of Marine PAR will generally be a flat rate price ranging from $300-$400 per engine.

A new Marine PAR tool, computer-aided Marine PAR (CAMPAR) has been developed for use by certified Caterpillar Marine PAR dealers. This tool assures the owner of consistent test result interpretation which can be relied upon to make cost-effective repair decisions.

Investment Analysis

A new tool to help analyze operating costs, Engine Investment Analysis (EIA), will help owners plan and budget resources. Available only through Cat dealers, EIA analyzes cost of engine ownership, expense, revenue, and profitability. The computer analysis will help owners evaluate the feasibility of repowering by accounting for important variables such as fuel efficiency, performance, and repair costs. Owners can compare their current cost of operation will potential savings of new investment options.

MEPS

Marine Engine Parts and Service (MEPS) outlets will be expanded in 1986, providing more North American points of contact for product support services. The expanded authorized service network means faster, better service to marine operators.

Taking a Hard Look at Costs

Mr. **Rose** suggested that there is a dramatic increase in the need for product support. As engines are being used longer, as fuel quality deteriorates, or as engines are laid up for extended periods due to ship inactivity, owners need to reassess direction and modify strategy to adopt to the changing maintenance requirements. New engine technology and support programs can help operators avoid unnecessary costs. "Fuel, oil, repair and maintenance costs can be controlled by using the available product support programs. While fuel and lubricants can account for almost 90 percent of vessel operating costs, the cost of downtime at the wrong time can destroy profits," he stated. "Survivors in this industry will plan their success ... by knowing current operating costs and weighing each repair option as it relates to cash flow, age of equipment, fuel cost, anticipated repair and maintenance costs. The balance sheet will quickly determine when its time to change the method of operation. Caterpillar product support capabilities are unrivaled and are in place to help owners do just that."

For further information, and complete literature on Cat support programs, plus a free copy of a new North American Marine Service Directory (for Caterpillar engine owners),

Circle 47 on Reader Service Card

Gulf Coast Fabrication Delivers 46th Vessel Built At Pass Christian Facility

Gulf Coast Fabrication, Inc. of Pass Christian, Miss., has delivered a 266-foot by 53-foot by 23-foot self-opening dump scow to Weeks Dredging, Inc. of Cranford, N.J. The vessel was completed early this year and is homeported in New York.

The barge is designed to carry dredging spoils and has a total cargo capacity of 4,600 cubic yards, or approximately 8 million pounds. The dumping system operates by means of hydraulically operated cylinders mounted at centerline. The hydraulic pumps are powered by a 4-71 Detroit Diesel engine through a "funk" power transmission unit. The engine was supplied by Kennedy Engine of Biloxi, Miss., and is designed for future radio control capability. This vessel, Weeks 256, is the 46th to be constructed at Gulf Coast Fabrication's Pass Christian facility since the company was founded in 1981.

For further information on Gulf Coast Fabrication's facilities and capabilities,

Circle 23 on Reader Service Card

ACT/PACE To Establish Own Offices On Gulf Coast

Associated Container Transportation/PACE Line is expanding its involvement in the trade between the U.S. Gulf and Australia and New Zealand, through establishment of its own offices in New Orleans and Houston. The change will also involve the appointment of Gulf and Eastern Steamship and Chartering Corporation to perform other agency functions. The Gulf operations will be managed by **Joseph Zehner,** ACT/PACE Gulf regional manager.

Last September, ACT established its own sales office in the Midwest. The line also commenced a slot-charter agreement with its main competitor, Columbus Line, which now allows PACE Line to offer greater frequency of sailings from a full range of Atlantic and Gulf Coast ports.

Gilead Named Vice President Of Operations For Zim-American Line

Capt. **Yoel Yanai,** senior vice president of operations for Zim-American Israeli Shipping Company, has announced the appointment of **Avi Gilead** as vice president of operations. Mr. **Gilead,** who joined Zim in 1975, is responsible for logistics and equipment control for Zim's North American operations, and he will oversee Zim's evaluation of innovations such as double-stack trains.

He received a master's degree in operations research from the Israeli Institute of Technology, and is a graduate of Haifa University with a degree in economics and statistics. He has more than 12 years of experience in the transportation industry, most recently serving as assistant vice president of operations for Zim.

Engelhard Offers Chloropac Generator Service Contracts

Engelhard Corporation, Iselin, N.J., a world leader in the manufacture of specialty chemical and metallurgical products, is now offering complete service contracts to customers of its Chloropac® in-situ sodium hypochlorite generators for the prevention of organic fouling in circulating water systems.

Structured to ensure trouble-free operation, Engelhard's Chloropac service contracts are customized for each user to provide regular servicing and inspections, routine and emergency repairs anywhere in the world and periodic updating of the systems as technological improvements are achieved.

Installed in over 1,000 industrial and commercial sites around the world, Chloropac units are available in virtually any size for the electrolytic generation of sodium hypochlorite from ordinary seawater. Applications range from coastal power stations to offshore drilling rigs and oceangoing vessels.

To obtain information on how to purchase a Chloropac service contract, or a Chloropac generator,

Circle 20 on Reader Service Card

Metropolitan Plumbing Expands Valve, Fitting Strainer Inventories —Literature Available

Metropolitan Plumbing Supply of Long Island City, N.Y., recently announced that they have doubled their inventory and tripled their machine shop capacity.

They can now supply quality shipyard and marine valves, fittings, flanges, strainers, expansion joints and piping specialties in sizes to 72 inches, in all metals: scupper valves, inverted vent check valves, deck drains, strainers, stop check, cross, angle, hose and practically any valve required.

For complete literature containing full information,

Circle 63 on Reader Service Card

Bailey Controls Announces Significant Price Reduction On 'Smart' Transmitters

Bailey Controls has announced a $400 price reduction on its Type Smart BC Transmitter used to measure and control flow, liquid level, gauge and absolute pressure. The reduction places the microprocessor-based BC Transmitter at prices nearly comparable to those charged for conventional transmitters.

The "Smart" BC Transmitter offers several distinct benefits, including increased accuracy (.10 percent of calibrates span), turndown (10/1) and self-diagnostics. It also communicates digitally over its signal lines with a Bailey hand-held communicator, a personal computer or any RS-232-C compatible terminal. Through this communication ability, users can configure, rerange, troubleshoot, or verify the operation of the transmitter from a remote location, saving time and manpower.

The Smart BC Transmitter also boasts integral capabilities that allow for true distribution of control intelligence. These include square root calculations for flow applications or function generating capability for tracking non-linear pressure inputs. Process flows and volumes, for example, can be configured easily as direct transmitter outputs. All information can appear on a convenient printout copy.

The Smart Transmitter is designed to withstand harsh application and environmental conditions found in industrial environments such as the chemical, pulp and paper, petroleum refining and metal producing industries.

Bailey attributes its ability to reduce its prices for the Smart Transmitter to recent technological advances with processor chips, plus the economies-of-scale achieved in manufacturing the increasingly popular device.

For free literature and additional information,

Circle 24 on Reader Service Card

Philadelphia Gear Names Thomas R. Kling President

Thomas R. Kling has been appointed president and chief operating officer of Philadelphia Gear Corporation. He succeeds **Russell C. Ball**, who will continue as chairman of the board.

Mr. **Kling** is a 15-year veteran of Philadelphia Gear, most recently serving as executive vice president. A graduate of the U.S. Military Academy at West Point, he is a member of the American Gear Manufacturers' Association and serves as senior vice chairman of the Manufacturers' Association of the Delaware Valley.

Philadelphia Gear, located in King of Prussia, Pa., specializes in the design and manufacture of large, high-capacity power transmission equipment. Products include gears, enclosed gear drives, fluid mixers and variable speed drives.

Sperry Receives $44-Million Navy Contract For Computer Center Work

Sperry Corporation, Information Systems Group, McLean, Va., is being awarded a $44,279,775 firm-fixed-price contract for an integrated scientific computer center to be installed at the David W. Taylor Naval Ship Research and Development Center, Bethesda, Md. The center consists of a vector processor, a scalar processor and an optical secure scalar processor. These will be linked to a mass storage system using local area network. The contract includes software, hardware and software maintenance, systems analyst support, training, pre-installation test facility, manuals, documentation and up to four optional mini-computer systems. The contract will be for one year with 10 yearly options to renew through February 1997. Thirty-three bids were solicited and five offers were received. The Navy Automatic Data Processing Selection Office, Washington, D.C., is the contracting activity (N66032-86-C-0001).

Panel on Rights-in-Data were (L to R): **Gordon L. Flynn**, president of Hardie-Tynes; Dr. **Norman V. Brown**, director Compliance Division, Office of the Competition Advocate of the Navy; **Colleen Preston**, counsel, House Investigations Subcommittee; **V. Rock Grundman**, government-business affairs counsel, Dresser Industries; and **Thomas M. Hopkins**, moderator.

Marine Machinery Association Discusses Quality And Rights-In-Data

More than 100 attendees at a recent Marine Machinery Association (MMA) meeting held at the Sheraton Crystal City in Arlington, Va., heard Alabama Congressman **Bill Nichols**, chairman of the Investigative Subcommittee of the House Committee on Armed Services, discuss the highly sensitive issue of Rights-in-Data. He explained that it was not the intent of Congress to discourage technical innovation of private industry by unilaterally demanding unlimited rights on all procurements. Rather, he said, the rights issue should be examined on each procurement and only where there is significant cost benefit to the Government, such as repeat purchases of large quantities, should the Government purchase the data rights.

The meeting was attended by representatives from the following important industry leaders: Advanced Technology, Inc.; AEROQUIP; ALCO Power; Baker & Mckenzie; Bendix; Blackmer Pump; Buffalo Pump; Byron-Jackson Pump; Cameron Pump; CLA-VAL; Colt Industries; Dayton T. Brown, EG&G SEALOL; FALK; General Dynamics; General Motors; Gimpel; Gould Pumps; Hale Fire Pumps; Hamel & Park; Hardie-Tynes; IBM; Industrial Analyzing; Ingersoll Rand; John Crane; KORNYLAK; Leslie; Lynmar Sales; Machinery Repair-DRESSER; Mason Neilan; Marotta Scientific; Pacific Pumps; Rix Industries; Roots Dresser; Sargent Industries; SESCO; Solar Turbines; Terry Corp.; Transamerica Delaval; Treadwell; Turbodyne; United Technologies Elliott; VACCO; Viking Pump; Warren Pumps; Washington Engineering; Waukesha Bearing; Waukesha Engine; Western Electric; Woodward Governor; Worthington Compressor; Worthington Pump; XOMOC; and various consultants to the industry.

Following opening remarks by MMA president **John E. Flannigan** and executive director **Daniel A. Marangiello**, the topic "Quality" was discussed by four eminently qualified panelists. Moderator for the session was Mrs. **Hazel Bradford** of *Business Week Magazine*.

George Landberg, president of Warren Pumps Inc., lead off the presentation. The following are excerpts from his remarks.

"The wave of change that has been triggered by the Competition in Contracting Act of 1984, the Defense Procurement Reform Act of 1984, and the Small Business and Federal Procurement Competition Enhancement Act of 1984, as well as the interpretation and implementation that has followed, has dramatically altered the historical industrial intra-structure that has delivered high-quality designs, products, and parts. Historically, manufacturers have provided cradle-to-grave services for products sold to the military. For example, Warren Pumps currently maintains drawings, patterns, and tooling for pumps furnished during World War I, and has supplied parts for such equipment during the current year.

"By focusing on one very narrow aspect of a product's total life cycle cost, namely maintenance parts, Congress, with the assistance of the Department of Defense, has begun the process of disassembling the integrated manufacturer who historically has provided the integration of design, prototype development, unit production, parts, repair service, and maintenance of the product's documentation over its planned life.

"I will not argue if the breakup of the OEM's (original equipment manufacturer) role into separate and district procurement steps is in the best interest of the U.S. and our

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Luncheon speaker at recent MMA meeting was Congressman **Bill Nichols** (D-AL) shown at left. With him are **Robert McClory**, Congressman from Illinois with 20 years of service, and **Colleen Preston**, counsel for House Investigations Subcommittee.

Panelists for morning session of Quality included (L to R): **Dan Marangiello**, MMA executive director; **Hazel Bradford**, *Business Week* writer, moderator; **George C. Landberg**, president of Warren Pumps; **David M. Cote**, president of Terry Corporation; **William C. Wyatt III** of ADTECH, Inc.; and **Richard B. McFarland** of Navy Ships Parts Control Center.

MMA Discusses

(continued)

defense establishment. However, if we want to maintain quality through all points of a product's evolution and useful life, we must recognize that the integration responsibility is being removed from the OEM and must be vested elsewhere.

"I do not believe in the short term that the Denfense Department has staff in numbers or by qualification to fill this role, nor have funds been provided to take on this mission. I believe in the long term that the loss of this integrating responsibility without a planned process to replace it represents the greatest threat to maintaining quality. The new approach to procurement, when fully implemented, may actually result in a reduction in quality at greater expense to the Government."

He was followed by Rear Adm. **William C. Wyatt III**, USN (Ret.) of ADTECH, Inc. Calling on his experience as U.S. Pacific Fleet maintenance officer from 1980 to 1985, he suggested current designs are so performance-driven that they have little margin for error in operation or maintenance. Repair quality in shipyards, both public and private, is not good, with rework of some form approaching 25 percent. He noted that even though technology has progressed, fleet equipment is slipping farther and farther behind. Quality parts and services are a must for the fleet, he said.

In his opening remarks, **Richard B. McFarland**, executive director, acquisition logistics planning support, Navy Ships Parts Control Center, stated that the Navy is better supported now than ever before. Supply support response time is 10.7 days, down from 14+ days a year ago. Quality control for nuclear and Level 1/Subsafe material is outstanding, but he noted it is nonexistent for other programs. He described the executive level quality assurance group of which he is a key member, as a problem-solving and not merely a policy-making group.

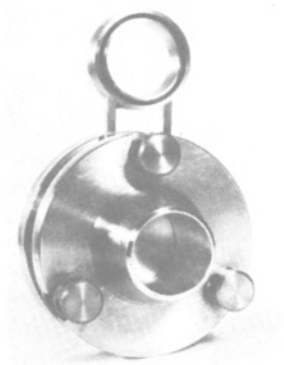
The Navy, he realizes must rely on technical data from OEMs for quality assurance, and he said the offer of the Marine Machinery Association to help QA working groups is most welcomed and accepted.

David M. Cote, newly elected president of Terry Corporation, spoke for the industry, voicing frustration over the dual quality standards wherein OEMs, in parts and service support, must maintain QA systems that meet the rigid requirements of original equipment manufacture, while parts suppliers do not. Competition for after-market business is not a fair and equal competition but in truth is more a reallocation that a completion because of various misinterpretations of the "Congressional mandate." He expressed concern over the serious erosion of quality in parts and services, and forecast an increase in fleet casualty reports.

At the afternoon session, Rear Adm. **Thomas M. Hopkins**, USNR (Ret.), moderated the panel on Rights-in-Data. Well versed on all facets of the subject, the former NAVSEA deputy commander for engineering skillfully drew out the panelists on all questions.

Ms. **Colleen A. Preston**, counsel for the Subcommittee on Investigations, House Committee on Armed Services, made it clear that in enacting the recent legislation Congress wanted fair and equitable prices for equipment and services.

American Piping Offers Steel Spectacle Blinds —Free Brochure Available



American Piping Products, Inc., manufactures a complete line of quick-acting spectacle blinds, featuring forged-steel bodies. They are designed for marine piping systems which cannot tolerate leakage and are commonly used for cargo segregation, inert gas and ballast piping.

The company has made available sizes 1- through 24-inches, with either butt weld or flanged ends and a wide choice of body materials and "O" rings to suit the application.

"O" ring seals located in the faces of the spectacle plate can be quickly replaced and eliminate the need for down-time servicing. A safety feature of the American line blind is the position of the spectacle plate, which indicates the line to be open or closed.

American Piping Products is offering a free brochure detailing the applications, features and construction of their spectacle blinds. The publication contains several cross-section diagrams of the units, along with weight and dimension charts. For a copy of the brochure,

Circle 18 on Reader Service Card

Draper Lab Receives $121.8-Million Contract For Guidance System

Charles Stark Draper Laboratory, Cambridge, Mass., is being awarded a $121,790,790 cost-plus-fixed-fee contract modification for design and development of an MK-6 guidance system for the Trident missile program. Work will be performed in Cambridge, and is expected to be completed September 30, 1989. The Strategic Systems Program Office, Washington, D.C., is the contracting activity (N00030-84-C-0036).

New Loudhailer Has Foghorn, 4-Station Intercom —Literature Available

Raytheon Marine Company has introduced the new, multi-function RAY-410 Loudhailer, featuring two-way intercom with inputs for up to four remote stations, plus automatic foghorn with six signals, anchor bell, and more.

This powerful, 25-watt hailer/listener projects voices over long distances, and amplifies sounds of far-off buoys, surf, etc. Its automatic foghorn is programmed to sound six standard international/inland signals for powerboats, or other vessels underway, vessels stopped, aground, at anchor, or in tow. Emergency "yelp" and other signals can be activated manually by the push-to-talk button on the microphone. All controls on the main console are by touch-keyboard.

For intercom communications, up to four remote stations can be connected to receive or initiate a call to the master station. An auxiliary input allows audio from an external source, such as radio or cassette, to be piped and amplified to all or selected stations throughout the vessel. The RAY-410 may also be used for burglar alarm functions.

Supplied with universal mounting yoke, the RAY-410 measures 6.5 inches high by 9.5 inches wide by 4.8 inches deep (165 × 240 × 120 mm), and can be mounted on a tabletop, bulkhead, or overhead.

The RAY-410 has passed Raytheon's tough environmental tests for shock, vibration, temperature extremes, and resistance to corrosion, fungus, and water penetration.

For further literature containing full information,

Circle 9 on Reader Service Card

Propulsion Update

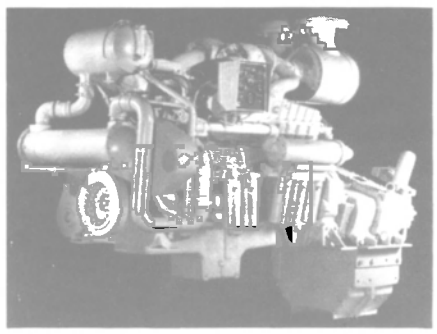
Cummins Introduces VTA28-M, 675-BHP Marine Diesel— Free Literature Available

Cummins Engine Company has announced the availability of their VTA28-M diesel engine for a wide variety of marine applications. Rated 675 bhp at 1,800 rpm, the powerful, compact VTA28-M is ideally suited for continuous duty marine applications, from tugboats and towboats to trawlers and draggers. The VTA28-M (28 liters) produces 55 bhp more than the former Cummins 1710 CID, V-12 engine, a tried and proven marine industry standard.

Applying the latest technology in advanced turbocharging and design process, Cummins developed the higher output while actually improving brake specific fuel consumption. In increasing the bhp from 620 to 675, the increase in total fuel consumption was held to less than one gallon-per-hour and the BSFC was reduced by 10 points.

At this power rating, the VTA28-M is lighter in weight and more compact than many comparable competitive marine diesels. In addition to the lighter weight-to-horsepower ratio, this also means there is more walk-around room in the engine compartment for ease of maintenance and service.

The new VTA28-M marine diesel is available through Cummins extensive marine distributor and dealer network. For free brochures containing photos, drawings and full specifications on the VTA28-M and the complete line of Cummins marine engines,



Circle 6 on Reader Service Card

V28 SERIES SPECIFICATIONS

Length (w/gear):	3044.19 mm/119.85 in.
Width:	1317 mm/51.80 in.
Height:	2011.72 mm/79.18 in.
Weight (dry w/gear & heat exchanger):	4000 kg/8800 lb.
Marine Gear:	MG-520 Deep Case
Engine Speed:	1800 rpm
Engine Power Output (continuous):	504 kw/675 bhp
Fuel Consumption (per/hr @ rated power):	214 gal/kw .352 lb/hp 126.7 liter 33.5 U.S. gal.

Literature Offered On New Spin-On Racor Fuel Filter/Water Separator

A new spin-on fuel filter/water separator is being introduced by the Racor Division of Parker Hannifin Corporation, which fits the existing fuel filter head on almost any diesel engine. Designed for easy installation and service, Racor Spin-On filters feature a see-through collection bowl, long a hallmark of Racor filter/separators.

The complete filter/separator with element and clear collection bowl fits onto the existing on-engine filter head, and neither tools nor adapters are required for installation. In addition, filter elements can be replaced and the see-through bowl is reusable. The straight Spin-On filter is available for Cummins, Detroit Diesel Allison, Caterpillar and International Harvester engines.

The Racor Spin-On filter/separator removes virtually 100 percent of the damaging water, and filters out solids down to two microns in size. Contaminants are separated into the see-through collection bowl, and isolated there until they are flushed away through the self-venting drain in the bottom.

To combat the damaging effects of emulsified water on filter elements, Racor engineered a special filter media called Aquabloc™. The media is chemically treated to screen out emulsified water and microscopic solids. This tough material makes emulsified water bead up on the element, then sheet off into the collection bowl.

Two optional features enhance the new product's capabilities. First, a water sensor in the collection bowl can be wired to a panel-mounted indicator to signal when the container should be drained. Second, in cold weather, a Racor self-regulating diesel fuel heater can be installed between the fuel tank and the pump to prevent power loss and stalls due to waxing. They also assist in cold weather starting and assure smooth engine operation in severe conditions.

Racor straight spin-on fuel filter/water separators.

For additional information including specification and cross reference charts on Racor Spin-On filters,

Circle 15 on Reader Service Card

EMCO Introduces Boiler Fuel Oil Monitor —Literature Available

A new boiler fuel oil monitor consisting of a meter augmented by a complete line of transmitters was recently introduced by the Engineering Measurements Company (EMCO), Longmont, Colo.

The meter features stainless steel construction with sealed bearings and FNPT or flanged-wafer connec-

tions. Transmitters provide pulse or analog outputs with rate and totalizer displays. Highly accurate over a wide range of flow and viscosity, the system is designed for easy installation and low maintenance.

For further information and complete literature on the new boiler fuel monitor from EMCO,

Circle 17 on Reader Service Card

Mid-America Marine Offers Literature On Generator And Propulsion Engines

Mid-America Marine (M.A.M.) of Memphis, Tenn., which specializes in sales and service of marine and industrial generator sets, power units and propulsion engines, has made available free literature on the products and services offered by the company.

Included in the package is information on the complete marine supply line offered "from nuts to turbochargers," and fliers on custom-built generator sets and marine propulsion.

Also included is an "Introduction to Mid-America Marine" which explains that M.A.M. can custom build any package desired to customers' specifications. Qualified technicians perform all in-house work necessary for this operation. M.A.M. handles a variety of new and rebuilt products for the market and are capable of giving service 24 hours a day with comprehensive inventory of marine supplies at competitive prices. With a "Hot Shot Truck" on call at all times, the publication points out, customers are assured of fast and courteous service direct to the boat.

For further information and free copies of the literature offered by Mid-America Marine,

Circle 66 on Reader Service Card

$20-Million Navy Contract To Westinghouse Electric For Launcher Subsystems

Westinghouse Electric Corporation, Sunnyvale, Calif., is being awarded a $20,000,000 cost-plus-incentive-fee contract for launcher subsystems for the Trident missile program. Work will be performed in Sunnyvale, and is expected to be completed September 1, 1991. The Strategic Systems Program Office, Washington, D.C., is the contracting activity (N00030-86-C-0040).

$2.5-Million Follow-On Contract Awarded SEACOR

Systems Engineering Associates Corporation (SEACOR) has been awarded contract N00140-86-D-9457 to provide engineering and technical services in support of technical training equipment (TTE) for the Naval Sea Support Center, Atlantic (NAVSEACENLANT), Philadelphia. This is a follow-on contract to provide Navy Training Plans, Equipment Facility Requirements Plans, Initial Outfitting of Training Activities and Technical Training Equipment engineering and logistics support. Credit for this follow-on award goes to SEACOR's team of technical writers, logisticians, technical artists and engineering technicians whose performance over the past 10 years has earned SEACOR their reputation for leadership in all areas of Technical Training Support.

The awarded contract is valued at $2.5 million over a 30-month period. It will be managed by **Thomas Weller** out of SEACOR's Northern Division headquarters in Cherry Hill, N.J. Approximately 22 Technical Training experts will be assigned to this contract.

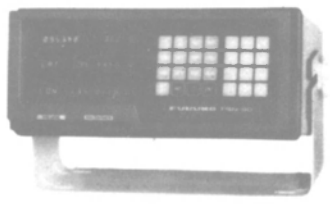
SEACOR specializes in providing engineering, management and technical services to the Government and private industry. Presently employing over 1,200 people, and operating out of 23 worldwide locations, SEACOR is expanding their reputation for providing responsive, quality service to both DoD and commercial clients.

Circle 88 on Reader Service Card

ELECTRONICS UPDATE

Furuno Offers New High-Performance SatNav Receiver—Literature Offered

With an ever increasing number of vessels now sailing outside convenient loran C coverage, Furuno has introduced the FSN-90, a new satnav receiver with some of the most popular performance features.



The FSN-90, after automatically acquiring the satellite signal, shows position in the lat./long. on a bright green, three-line fluorescent display. The system will also show date and time, the last 20 fixes and the next 100 satellite forecasts. It alerts the user for a multitude of operating conditions. For example, arrival and cross-track error alarms, satellite acquisition, fix computation, etc.

The FSN-90 will accept manual entry of up to 10 waypoints and computes a wide range of navigational data, including range/bearing on either Great Circle or Rhumb Line course, set and drift, and distance run, as well as range/bearing, course to steer and time to go to any waypoint. The unit is completely self checking and permits easy entry of both speed and magnetic heading. The FSN-90 has standard interfaces for speed and either gyro or magnetic heading inputs, plus standard outputs to Furuno GD-170 or GD-2000 video plotters or ZR-394 printer. It will also operate as a hybrid navigation system with either the LC-80 or LC-90 loran receivers.

A built-in keep-alive system protects stored data in case of power failure, and the FSN-90 operates from a standard 12 or 24 VDC supply, requiring just 14 watts.

For complete literature describing the new Furuno FSN-90,

Circle 68 on Reader Service Card

RST Introduces 'Smart' Load Monitoring/Line Payout System

A microprocessor-based device that monitors line tension, load position, and line speed is now available from Remote Systems Technology Inc. The device may also control line position and speed.

RST's Load Monitoring/Line Payout System incorporates 16K bytes of program memory and interfaces with the following inputs and outputs: four channels of analog input that can be converted to digital values with 12-bit (one part in 4096) resolution; four input amplifiers for calibration of transducer signals; eight digital inputs for special function switches and On/Off sensors; four output relays (used to drive order higher power relays); two analog output channels; 20 position sealed keyboard; and two line by 16 character backlit LCD display.

The input channels can be configured to accept load cells; pressure, angular position, and linear position transducers; temperature and magnetic flux sensors; and pendulums.

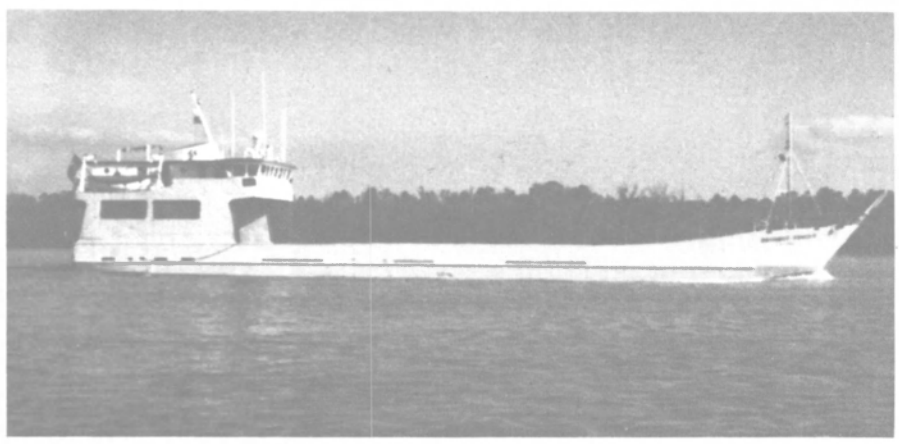
The four output relays can drive large relays for controlling motors and alarms; the analog output channels can drive meters for analog indication of calculated values.

System features include an alphanumeric display to assist the operator through instruction sequences, an alarm function and an On/Off control function.

Custom configurations are also available to meet specific application requirements.

For more information,

Circle 98 on Reader Service Card



The Bahamas Ranger was lengthened from 130-feet to its present 170-feet by Conrad Industries, Inc. of Morgan City, La.

Conrad Lengthens And Overhauls Cargo Ship —Literature Available

Conrad Industries, Inc. of Morgan City, La., recently completed the two-month lengthening and overhaul of a cargo vessel owned by Bahamas Ranger Limited of Nassau, Bahamas. The project was valued at a quarter of a million dollars.

The cargo ship, the Bahamas Ranger, a beach-landing vessel equipped with a loading ramp for under developed waterfronts, was lengthened by Conrad with the addition of a 40-foot midsection.

The lengthening of the Bahamas Ranger, according to Conrad project manager/estimator **Richard P. Chiasson**, was to accommodate an increasing demand for shipping cargo space on the vessel. The cargo ship is used to carry supplies and equipment to areas in the Bahamas inaccessible to aircraft.

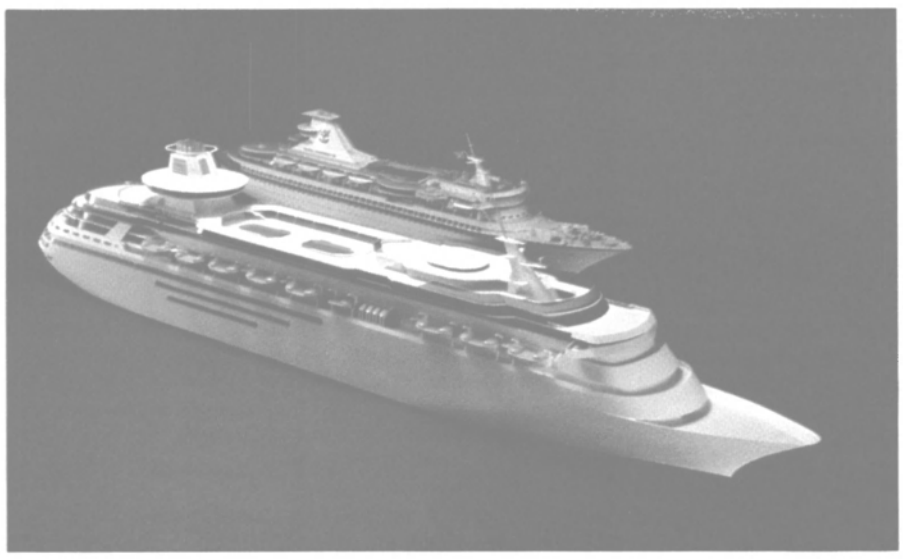
Conrad, which outbid several companies for the project, landed the contract in July of last year, and by August had constructed the new section to be added to the cargo ship.

Mr. **Chiasson** said the lengthening involved the cutting of the vessel into two halves and separating the halves on railcars. The prefabricated section was then lifted by cranes and inserted into place. The sections were then welded together.

The conversion also involved the reworking of portions of the Bahamas Ranger's electrical systems as well as other equipment.

For further information on the services and facilities of Conrad Industries, Inc.,

Circle 45 on Reader Service Card



Model of Royal Caribbean's 70,000-grt Sovereign of the Seas dwarfs to-scale model of line's smallest ship, 18,556-grt Sun Viking. New ship will be delivered in December 1987 by Chantiers de l'Atlantique in St. Nazaire, France.

Construction Underway On Big Royal Caribbean Cruise Liner

The Chantiers de l'Atlantique shipyard in St. Nazaire, France, recently began cutting steel for the huge cruise liner under construction for Royal Caribbean Cruise Line of Miami. To be named Sovereign of the Seas, at more than 70,000 grt and carrying 2,276 passengers, double occupancy, the new vessel will be almost twice the size of Royal Caribbean's current largest ship, the 37,584-grt 1,414-passenger Song of America.

The new ship will have an overall length of 874 feet, beam of 103.5 feet, and draft of 25 feet, enabling her to transit the Panama Canal and dock in most ports in the Caribbean, where she will operate initially on one-week cruises. She will be powered by four Atlantique/Pielstick 9PC20L diesel engines, each with an output of 7,425 bhp, capable of driving the ship at a top cruising speed of 21 knots.

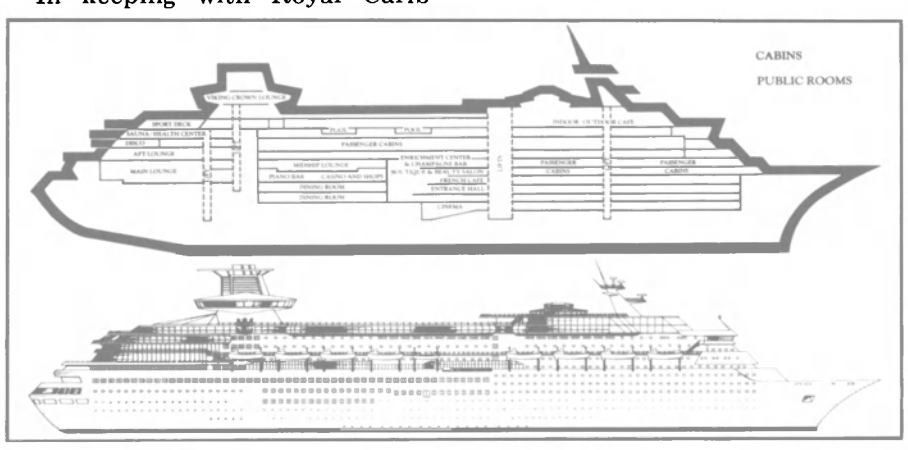
With a total ultimate cost of $183.5 million, the Sovereign is being financed by the shipyard and a consortium of banks, led by Manufacturers Hanover Norge and Christiana Bank, whose principal offices are in Norway. The bank consortium will provide pre-delivery financing during the construction period, and the shipyard will provide a loan of approximately 80 percent of the project cost at the time the ship is delivered in December 1987.

In keeping with Royal Caribbean's other four ships, the decor and ambiance of the newest member of the fleet will be a blend of contemporary Scandinavian design and European sophistication that has proved extremely effective with the American market. More than $1.7 million in original artwork will enhance the decor in the public rooms.

A unique feature of the ship is called The Centrum, a central lobby area spanning a height of five decks, serving as a focal point for passengers to meet and mingle. The Centrum will have glass-walled elevators (two of the ship's 14), spiral staircases, fountains, and plants. No Royal Caribbean ship is complete without a Viking Crown Lounge cantilevered from the funnel; the Sovereign's will be 12 decks above sea level and seat 250 people.

The new ship will have 12 passenger decks, and 722 outside and 416 inside staterooms with private bath, interactive television, individually controlled air conditioning, telephones, and 110-volt electrical power.

When the Sovereign of the Seas sails from Miami for the first time in January 1988, passengers will experience a cruise ship that reflects the American lifestyle enhanced by Norwegian marine tradition and French shipbuilding expertise and prestige.



M.A.N.-B&W Offers New 24-Page Color Brochure On Marine Generator Sets

M.A.N.-B&W Diesel recently published an unusually attractive new 20-page full-color brochure describing "Holeby"-manufactured generator sets.

Besides describing heavy fuel generating sets and giving basic data, the brochure also addresses such topics as the "Total System Solution," and "Total Diesel."

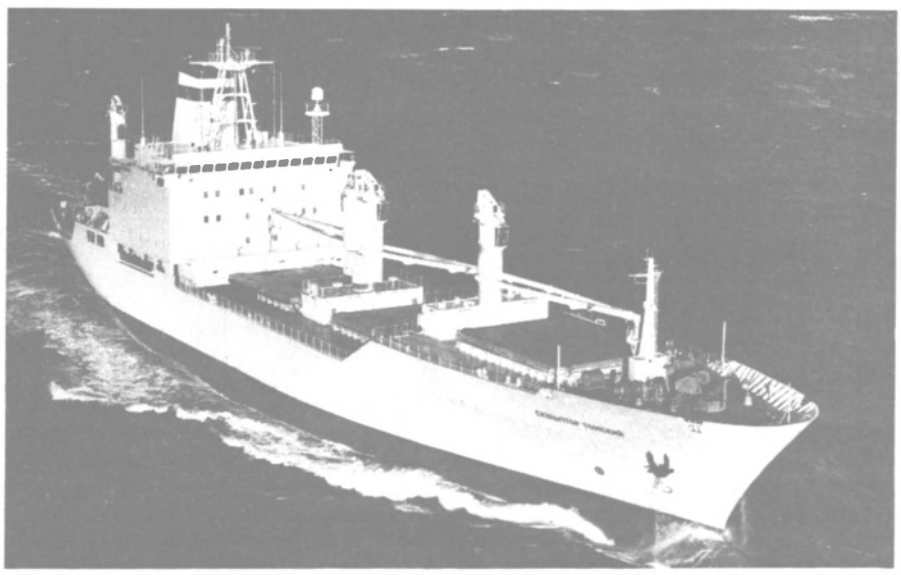
Patricularly interesting to shipowners is the availability of computer-aided analysis to determine the most economical power solution for a vessel's specific operating profile. This is accomplished by optimizing combinations of diesel generators plus waste heat/turbine generators, and main engine power take-off generators.

According to the manufacturer, the 75-year-old family relationship between "Holeby" and M.A.N.-B&W main engine departments means that "Holeby" GenSets are designed on the basis of a continuous common research and development effort to insure optimized unifuel and power supply solution backed by one of the largest marine diesel service organizations.

In addition to specification data and excellent photos of the different types of GenSets, the publication contains outstanding photographs of some 16 vessels that are equipped with them.

For further information and a copy of the new brochure,

Circle 55 on Reader Service Card



Aalborg Delivers Multipurpose Reefer To Soviet's Sudoimport

Aalborg Vaerft in Denmark recently delivered the advanced refrigerated cargo ship Skulptor Tomskij to V/O Sudoimport. Named for a famous Soviet sculptor, the 10,700 cubic meter vessel is the second of three ordered in 1984. The first was completed in November 1985 and the third is scheduled for delivery in May this year.

Built to USSR Registration of Shipping classification, the Tomskij is designed as a multipurpose reefer capable of transporting fruit as well as frozen meat. The ship has large open type cargo hatches that, with the necessary reinforcement of tank tops and decks, provide the capability of carrying both 40-foot and 20-foot containers in the cargo holds as well as on the weather deck.

The new reefer has an overall length of 453.4 feet, beam of 70.5 feet, depth of 43 feet, and draft (bananas) of 23 feet. Propulsion machinery consists of a low-speed Briansk/B&W two-stroke, direct reversible, crosshead marine diesel, type 6DKRN 67/170. The engine is fitted with constant-pressure turbocharging by a BBC system. Main engine output is 12,874 bhp at 123 rpm. It drives, via intermediate and propeller shafting, a 4-bladed nickel/aluminum/bronze propeller with fixed blades.

The electric supply is provided by four diesel generator plants, each consisting of a 720-kw generator direct-coupled to a B&W Holeby four-stroke 6T 23 LH-4 with an output of 1,033 bhp at 750 rpm. Both the main and auxiliary engines are designed for burning heavy fuel with a viscosity of 380 cSt at 50 C.

For additional information and free literature on Aalborg Vaerft facilities and capabilities,

Circle 74 on Reader Service Card

Wijsmuller (U.S.A.) Appoints Daniels Vice President

Wijsmuller, the Dutch heavy lift transportation, towage and salvage company which operates one of the world's largest fleets of heavy lift semisubmersible vessels, and **Jim P. Stevens**, president of Wijsmuller (U.S.A.) Inc., recently announced the appointment of **Matt J. Daniels** as vice president.

Mr. **Daniels** comes to Wijsmuller after several years of experience in the offshore industry. Mr. **Daniels**, who joined Wijsmuller effective March 1, 1986 will spend his first three months in Wijsmuller's home office in the Netherlands before joining the Wijsmuller (U.S.A.) Inc. office.

NEW & REBUILT EQUIPMENT FOR IMMEDIATE DELIVERY

NEW CONDENSER TUBES

3,500 of ¾", 13'2½" long, 18-gauge, aluminum-brass condenser tubes.

2,200 of ⅝", 9'6" long, 18-gauge, 70/30 cupro-nickel condenser tubes.

OUR PRICE: ½ of Mil Price

We have all type of Reciprocating Pumps in stock: Horizontal Duplex, 6x4x6, 9½x6x10; and many others.

STEAM MOORING WINCHES

Equal-to-new, Latest Type:

(3) Pusnes 10-ton enclosed gear type. New cost approximately $35,000 each.

OUR PRICE: $8,500 each

(3) PUSNES 20-ton Mooring Winches, built in 1976. New Price approx. $60,000 each.

OUR PRICE: $11,000 each.

All available in our yard in Jersey City.

(3) New Byron Jackson Pumps 700 GPM at 150' head with 50 hp motors.

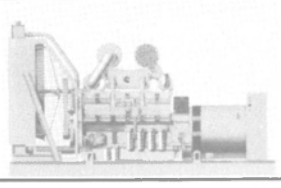
Price: $2,500 each

GENERAL ELECTRIC TURBINE ROTORS

We have the largest stock of main turbine and auxiliary turbine rotors in the United States: including:
32,000 HP
30,000 HP
28,500 HP
19,500 HP
9,300 HP
FOR THE AUXILIARY TURBOGENERATORS:
6-stage 750 KW
6-stage 600 KW
5-stage 500 KW
3-stage 500 KW
FOR THE CARGO PUMPS OR AUXILIARY TURBINE ROTORS WE HAVE:
DR125
DP125
DR120
DP120
DP114

WINCHES

Thirty (30) winches, almost new, American Hoist & Derrick. Twenty (20) 5-tons at 118'; ten (10) 30-tons at 30'. Can be used with DC, AC, hydraulic or diesel drive. Price: 5-ton, $1,500 each. 30-ton, $3,000 each.



(1) Reconditioned 600 KW Cummins Diesel Generator Set, radiator cooled; built in 1981, 440V AC
New Price: $120,000.

OUR PRICE: $39,000

General Motors 1600 HP 16-278A Diesel Engine complete with Allis Chalmers 1000 KW 550V DC Generator.

(1) General Motors 12-278A 1000 HP Diesel Engine complete with Allis Chalmers generator and 1000 HP Motor with reduction gear.

(1) 1000 HP General Motors 12-278A Engine complete with clutch.

All used, in excellent condition, with spare parts. We offer these at bargain prices; just call!

(2) reconditioned HIGH PRESSURE DIESEL STARTING AIR COMPRESSORS, Ingersol Rand, 50 CFM at 400#, driven by 25 HP, 440V Westinghouse motor, in excellent condition. Price: $2,900 each.

(1) Complete set of Cylinders and Pistons for FAIRBANKS MORSE 32E14 DIESEL ENGINES, used, in excellent condition. Price: $700 per cylinder.

(6) Cooper Bessemer 300 HP, 6-cylinder, type FS 900 RPM, 8¾ X 11 DIESEL ENGINES. Used, in good condition. Price: $3,000 each.

(2) Cylinder Covers for 840x1600 B&W Diesel Engines, excellent condition.

OUR PRICE: $1,800 each

We also have in stock Winches, 4x6 Lidgerwood Steam Winches, can be operated with air, equal-to-new, with ⅝" wire rope, approximately 2500# pull. New Price $10,000 each.

OUR PRICE: $1,500 each.

Reconditioned 7x12 American Hoist 2-Speed Winches; can be operated by air; 5-ton# low speed; #3-ton# high speed. New Price $15,000 each.

OUR PRICE: $3,300 each.

(2) NEW 44,000# Baldt Anchors

500 Tons Mooring Chain: 2"-4" at extremely low prices.

All sizes Shafting: 8"-28" in diameter at 15¢ per pound.

All sizes Heat Exchangers in Stock

NEW PUMPS

We have the following New Bronze fitted pumps, Brand New, built in 1981, in stock, which we offer at extremely low prices:

(2) Aurora 2500 GPM at 155' head, New Model 411, size 8x20x15. New Price $8,000 each.

OUR PRICE: $2,500 each.

(2) Ingersoll Rand Type 3GT, New, all Bronze, 400 GPM at 150 PSI. New Price: $12,000 each.

OUR PRICE: $1,800 each.

Ingersoll Rand Model 4x3x13, capacity 300 GPM at 30' head; or 500 GPM at 100' head. New Price: $2,500 each.

OUR PRICE: $500 each.

New Deepwell Pumps, 4-stage, capacity 1500 GPM at 125 PSI; Goulds Model JMC 8x14 (bowl & column assembly only). Goulds Price $5,500.

OUR PRICE: $1,800.

We also have other Deepwell pumps in stock, including:

(3) Complete Pumps, less motors, Byron Jackson 12GH, 600 gPM at 156' head.
New Price $8,000 each.

OUR PRICE: $2,500 each.

Hundreds of other pumps in stock—call us for your pumps requirement.

Two (2) New 35-ton pedestal type Whirly ship cranes, manufactured by Appleton in 1979; unused with electric hydraulics, 300 HP 440V AC motors, rated 35-tons with 56' boom. All controls and motors ABS and CG approved. New Price: $295,000. OUR Price: $49,000 each, as is, Jacksonville.

NEW AXIAL FLOW FANS with totally enclosed motors & stainless steel Impellers.

(2) JOY 25,000 CFM at 3" with 20 HP 440V AC motors. New Price: $4,900.
OUR PRICE: $1,500 each.

(1) JOY 66,000 CFM at 3" complete with 40 HP 440V motor. New Price: $11,500.
OUR PRICE: $2,500 each.

(2) NEW 108,000 CFM at 4" static pressure with 120 HP totally enclosed explosion-proof motor 440V. New Price $39,000 each.
OUR PRICE: $7,500 each.

These units could be used to ventilate the largest ship.

(2) 100-ton York hermetic compact AIR CONDITIONING UNITS, complete with condensers, chillers; all in one piece, built 1969, all bronze and copper nickel. Original Cost: $200,000 each. OUR PRICE: $9,500 each

(2) Used, in excellent condition, WORTHINGTON 125-TON AIR CONDITIONING CHILLER UNITS, complete with 125HP Worthington turbine, 440#. New Cost of these units approximately $125,000. Our Price: $11,950 each.

CALL
WRITE
WIRE

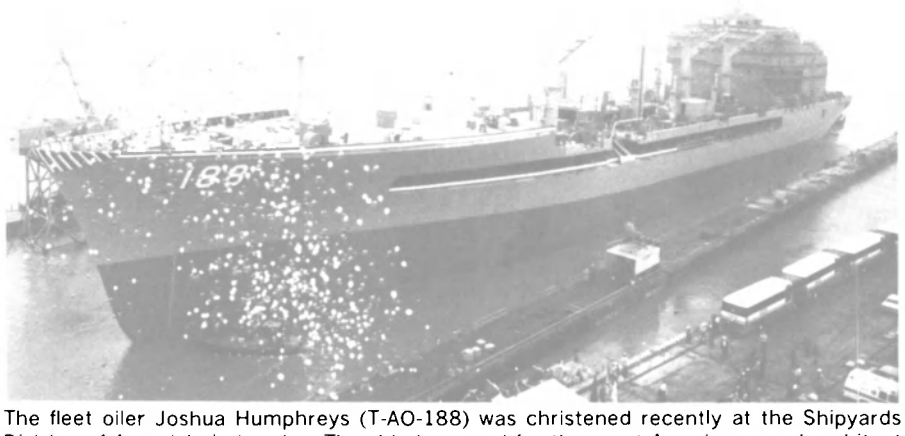
4½ ACRES OF MARINE EQUIPMENT FROM
PORTHOLES TO PROPELLERS—ALL EQUIPMENT GUARANTEED
AT OUR JERSEY CITY WAREHOUSE—210 Henderson St., Jersey City, NJ 07302

JACKSONVILLE WAREHOUSE—8th & Evergreen St., Jacksonville, Florida

MARITIME POWER CORPORATION

MAIN OFFICE: 200 HENDERSON STREET, JERSEY CITY, N.J. 07302 (201) 433-0870

TELEX: 620533 MARPOW



The fleet oiler Joshua Humphreys (T-AO-188) was christened recently at the Shipyards Division of Avondale Industries. The ship is named for the great American naval architect who designed, built, and outfitted many U.S. Navy ships during the Revolutionary War and the War of 1812. The vessel is scheduled for delivery in December this year.

Sponsor of the T-AO-188 was **Mrs. Ruth Metcalf** (center), wife of Vice Adm. **Joseph Metcalf,** Deputy Chief of Naval Operations (surface warfare); looking on are **Albert Bossier,** president of Avondale's Shipyards Division, and **Elizabeth Metcalf,** maid of honor.

Avondale Christens Joshua Humphreys, Second Fleet Oiler Of Kaiser (T-AO-187) Class

The second in a series of six fleet oilers of the Henry J. Kaiser (T-AO-187) Class under a contract with the U.S. Navy by the Shipyards Division of Avondale Industries, Inc., was christened the Joshua Humphreys (T-AO-188) in recent ceremonies at the yard. She is scheduled for delivery in December 1986; the Kaiser will be delivered in September this year.

Avondale has a contract for six fleet oilers at a total cost of approximately $715,500,000. This contract is providing jobs for 2,000 Avondale employees. In previous contracts with the Navy, Avondale built five auxiliary oilers.

The Humphreys has an overall length of 667.5 feet, beam of 97.5 feet, and maximum draft of 36 feet. She is powered by twin 10-cylinder, medium-speed Colt/Pielstick PC4.2

diesel engines with a total output of 32,000 bhp, providing a service speed of 20 knots. The twin-screw design provides the vessels of the Kaiser Class with improved directional stability, ease of control, and mission reliability under combat conditions. Accommodations are provided for a crew of 137.

Vice Adm. **Joseph Metcalf III,** USN, Deputy Chief of Naval Operations (Surface Warfare), was the principal speaker at the christening ceremony. His wife, **Ruth Daniels Metcalf,** was the ship's sponsor. Other speakers included Vice Adm. **W.H. Rowden,** USN, Commander, Naval Sea Systems Command; **Albert L. Bossier, Jr.,** president of Avondale Industries, Shipyards Division; and Capt. **Paul D. Hurst,** Supervisor of Shipbuilding, Conversion, and Repair-New Orleans.

Special guests at the christening ceremony were Capt. **Wayne Humphreys,** USN, and his wife of Warrentown, Va. He is ship design engineer of Adm. **Metcalf's** staff, and a sixth-generation descendant of **Joshua Humphreys,** for whom the ship is named.

A great American naval architect and shipbuilder, **Joshua Humphreys** designed, built, and outfitted many ships during the Revolutionary War and the War of 1812. Often referred to as the "Father of the American Navy," he built the first two naval shipyards in the U.S. Two of his most famous ships, the Constellation and the Constitution (Old Ironsides), are still afloat today. He died in 1838 but is remembered today as one of the most influential figures in American naval history.

The mission of the fleet oilers is transportation of bulk products from shore depots to combatants and support forces underway. These ships also deliver limited fleet freight, cargo water, mail, and personnel. Each has a capacity of 183,500 barrels of oil in 18 cargo tanks, and is capable of simultaneously receiving, storing, and discharging two separate grades of fuel (JP-5 and DFM). All cargo pump and valve operations and the ship's segregated ballast system are operated from the cargo control center located in the aft superstructure. This center has an overview of the entire underway replenishment deck.

Underway replenishment is accomplished using transfer rigs with hoses suspended by a span wire than is automatically maintained in a constant-tension range. The T-AO vessels are also capable of refueling helicopters from a vertical replenishment facility aft of the accommodation house.

Mueller Steam Introduces Pump-Protection Valve—Free Literature Offered

Mueller Steam Specialty, a division of Core Industries, Inc., has introduced the Model 721 valve, designed for installation in pump discharge piping where it functions silently and automatically as a spring-loaded check valve, balancing valve and shut-off valve.

Line pressure of approximately ¼ psi will lift the disc off its seat. The acme threaded valve stem can be adjusted to whatever disc position is desired depending on flow requirements—from a bubble tight shut-off to full flow.

The yoke and valve stem threading are unwetted parts so they cannot be corroded or eroded by the line fluid, a feature unique to the Mueller Steam Specialty Model 721 valve. Field servicing can be done without special tools; even the packing can be replaced under full-line pressure.

The Mueller Steam Specialty Model 721 valve is available in cast iron, bronze, carbon steel, or stainless steel, and in other materials for special and unusual applications.

For additional information and free detailed literature on the new valve from Mueller Steam Specialty,

Circle 19 on Reader Service Card

Circle 106 on Reader Service Card ➔

Radio Technical Commission For Maritime Services Annual Meeting

April 29—May 1, Boston

This year's Annual Assembly Meeting of the Radio Technical Commission for Maritime Services (RTCM) will be held at the Copley Plaza Hotel in Boston, Tuesday, April 29 through Thursday, May 1. A Welcome Reception sponsored by the RTCM Booster Club will be held at 6:30 pm on April 28 for all registrants and their spouses.

Only one formal luncheon will take place this year, at noon on April 29. Keynote speaker will be **R. Bryssinck,** president of Comite International Radio Maritime.

Two historic tour programs have been planned. The bus tour on Tuesday will include highlights of Boston from Beacon Hill to the new City Hall, the waterfront area, Back Bay, Cambridge, and Faneuil Hall. On Wednesday the tour will follow the route of **Paul Revere** as he warned the countryside that the British were coming. It will also include Lexington Green, where Capt. **Jonathan Parker** and 77 Minutemen stood their ground against 700 of England's finest regulars, and the Old North Bridge where "the embattled farmers stood and fired the shot heard around the world." On both days participants may depart the tour at either Faneuil Hall at noon or the Copley Plaza at 12:15 pm.

Tuesday, April 29

8 am to 4 pm—Registration desk open

9-10 am—Annual Business Meeting

10-10:15 am—Coffee Break

10:15-11:45 am—Session I

Moderator: **L.R. Raish,** Fletcher, Heald & Hildreth

"Survey of the National Ocean Service," by **Paul M. Wolff,** NOAA, U.S. Department of Commerce.

"Maritime Radio Regulation for the Eighties and Beyond," by **Raymond A. Kowalski,** Federal Communications Commission.

"Radionavigation Systems Know No Boundaries—The Problems of International Coordination and Planning," by **David C. Scull,** Research and Special Programs Administration, Department of Transportation.

"Transitioning Into the FGMDSS in the United States," by Capt. **Robert E. Fenton,** USCG, and **Joseph D. Hersey Jr.,** U.S. Coast Guard, Department of Transportation.

Noon-2:15 pm—Luncheon

Keynote speaker: **R. Bryssinck,** president, Comite International Radio Maritime.

2:30-3:35 pm—Session II

Moderator: **G.F. Hempton,** Federal Communications Commission.

"A Report on the April 1986 Session of the International Maritime Organization (IMO) Radiocommunications Subcommittee," by Capt. **Robert E. Fenton,** USCG.

"Recent Developments for Radio Communicators and Equipment Maintainers in the Future Global Maritime Distress and Safety System (FGMDSS)," by **William A. Luther,** Federal Communications Commission.

Panel Discussion on National and International Implementation of the FGMDSS.

3:35-3:50 pm—Coffee Break

3:50-5 pm—Session III

Moderator: **H.T. Blaker,** Rockwell International.

"The New Wave—Automatic Telex, Data and Digital Selective Calling Systems," by **Saverio J. Berte,** Radio-Holland U.S.A., B.V.

"North European DSC Network—Scandinavian Approach," by **Goste Bengtsson,** Swedish Telecom Radio.

"A Demonstration of Digital Selective Calling Equipment," by **Per Thrane,** Thrane & Thrane A/S, Norway, and **Saverio J. Berte,** Radio-Holland U.S.A.

Wednesday, April 30

8:30 am-12:30 pm—Registration desk open.

9-10:30 am—Session IV

Moderator: **Yaraslov Kaminsky,** The Mitre Corporation.

"The 1.6 GHz Satellite EPIRB System—Preparations for Pre-operational Demonstration," by **Hans Kesenheimer,** Dornier System GmbH, West Germany.

"Current Status and Future of the COSPAS/SARSAT System," by **James T. Bailey,** National Environmental Satellite Data and Information Service, NOAA, Department of Commerce.

"Interactive Distress Beacon for SARSAT," by **Frederick J. Kissel,** Westinghouse Electric Corporation.

"COSPAS/SARSAT SAR Performers," by **Wayne A. Hembree,** National Aeronautics and Space Administration, and **Yaraslov Kaminsky,** The Mitre Corporation.

10:30-10:45 am—Coffee Break

10:45 am-12:35 pm—Session V

Moderator: **J.C. Fuechsel,** National Ocean Industries Association.

"INMARSAT Looks to the Future," by **David W. Lipke,** Communications Satellite Corporation.

"Problems and Opportunities in the Transmittal of Data Via Satcom," by **George X. Tsirimokos,** Sperry Corporation.

"JRC-FDMS for Use with INMARSAT System," by **Kouichi Konnai, Yoshikatsu Okabe** and **Masanobu Okuyama,** Japan Radio Company, Ltd.

"Standard C: A Low-Cost Message Handling Ship Earth Station," by **John C. Bell** and **David C. Schoen,** International Maritime Satellite Corporation.

12:35-2:05 pm—Lunch Period, no scheduled activities.

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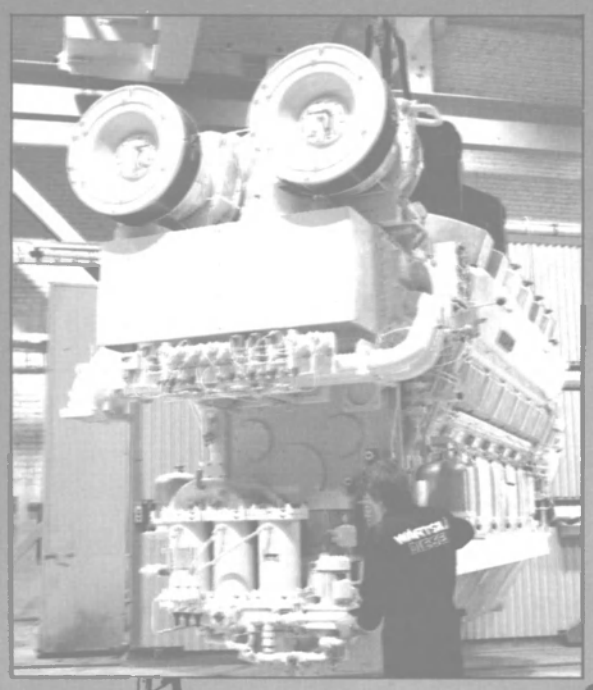

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(continued)

2:05-3:15 pm—Session VI
Moderator: **Carl S. Andren,** Racal-Megapulse, Inc.

"Capabilities of Future Radiodetermination Systems: An Analysis of Surface and Space-Based Candidates," by **Keith D. McDonald,** Federal Aviation Administration.

"NAVSAT in the Marine Environment," by **C. Rosetti,** European Space Agency.

"The Loran C System of the People's Republic of China," by the representatives of the People's Republic.

3:15-3:30 pm—Coffee Break

3:30-5 pm—Session VII
Moderator: **Ralph F. Eschenbach,** Trimble Navigation.

"Special Committee 104 Recommendations for Differential GPS Service," by Dr. **Rudolph M. Kalafus,** Transportation Systems Center, Department of Transportation.

"U.S. Coast Guard Differential GPS System Development," by Lt. Cdr. **John E. Quill,** USCG.

"Examining the Use of a VHF Radio Link for Transmission of Differential GPS Data," by **James B. Chadwick** and **Thomas B. Silliman,** Camden Instruments Corporation.

"A Differential GPS Receiver for Marine Navigation, by Dr. **Alison Brown,** Litton Industries.

5:45-7:45 pm—RTCM Assembly Reception for registrants and spouses.

Thursday, May 1

8:30-10:30 am—Registration desk open

9-10:30 am—Session VIII
Moderator: **John H. Beattie,** Racal-Decca Ltd.

"The Perfect Fix—A Marriage Made in Heaven," by **Patrick Patent,** Racal-Megapulse, Inc.

"An Innovative Solution to Marine Radionavigation Systems Integration," by **A. Ramsay,** Racal-Decca Marine Navigation, Ltd., U.K.

"Maritime Racons and Transponders," by **Joseph D. Hersey Jr.,** U.S. Coast Guard.

"Racons, Transponders and User-Selectable Services," by **C. Gunnar Svala** and **Bo Morwing,** The Ericcson Corporation, Sweden.

10:30-10:45 am—Coffee Break

10:45 am-12:15 pm—Session IX
Moderator: **David C. Scull,** RSPA, Department of Transportation.

Panel Discussion: The Impact on Users of Government Radionavigation Policy and Plans.

12:15-1:45 pm—Lunch Period, no scheduled activities.

1:45-3:15 pm—Session X
Moderator: **Charles S. Carney,** National Marine Electronics Association.

"Electronic Charts," by **Mortimer Rogoff,** Navigation Sciences, Inc.

"WATERCOM—The Direct Line," by **Richard A. Baker,** Waterway Communications Systems, Inc.

"From Telegraphy to Teletherapy," by **Steven A. Herring,** PA-C, Medical Advisory Services, Inc.

"A Demonstration of the Navigation Information Network," by **Bruce Seaton,** Defense Mapping Agency, Department of Defense.

3:15-3:30 pm—Coffee Break

3:30-5 pm—Session XI
Moderator: **Martin W. Bercovici,** Keller and Heckman.

"Planning NOAA Satellite Operations for the 1980s," by **Daniel J. Cotter** and **W. John Hussey,** National Environmental Satellite Data and Information Service, NOAA, Department of Commerce.

"Update from the FCC: The Mobile Satellite and Radiodetermination Satellite Services," by **John B. Richards,** Federal Communications Commission.

"The First Geostar Satellite—Initial Test Results," by Dr. **Leslie O. Snively,** Geostar Corporation.

"Cellular Technology in the Offshore Environment," by **Alec J. Bentley,** Gull Cellular Associates.

5-5:10 pm—Closing remarks.

For additional information on the meeting and tour programs, contact Radio Technical Commission for Maritime Services, 655 15th Street, N.W., Washington, D.C.: (202) 639-4006.

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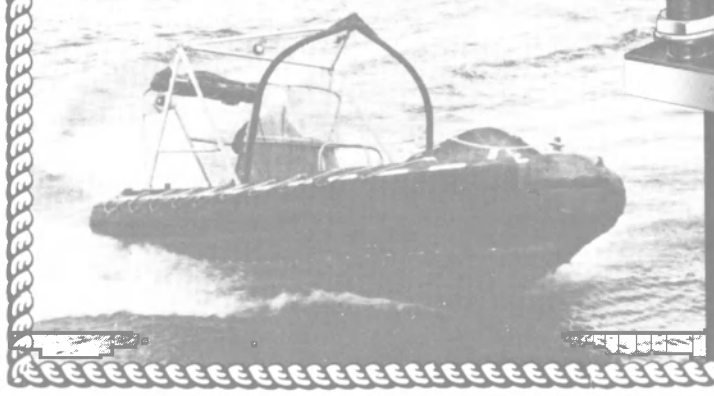

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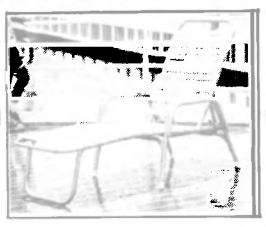

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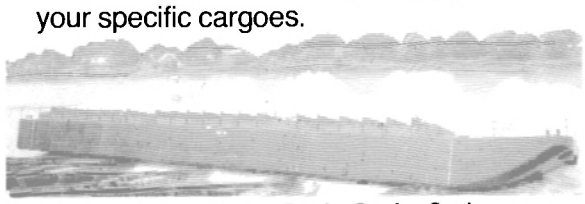

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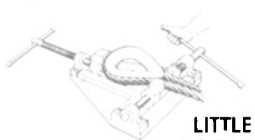

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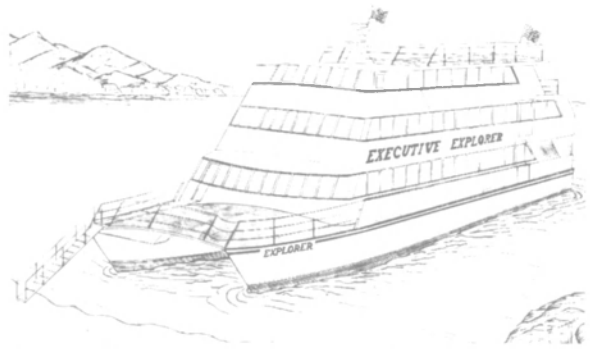
Nichols Brothers To Build Catamaran Cruise Ship For Glacier Bay Yacht Tours



Drawing of the Executive Explorer, which will be able to operate on voyages with a range of 2,600 miles.

Nichols Brothers Boat Builders Inc., Freeland, Wash., is building a 30-meter (99-foot), 25-knot catamaran for operation by Glacier Bay Yacht Tours, Inc., that will provide luxury passenger accommodations for 49 people in 25 staterooms.

The catamaran, being built for **Robert** and **Lori Giersdorf** of Seattle who will in turn lease the vessel to Glacier Bay Yacht Tours, Inc., will be delivered in time for the early summer cruising season in Alaska, according to Mr. **Giersdorf.**

The cruise vessel, which will carry the name M/V Executive Explorer, is being built to international shipbuilding and safety standards for domestic and international operations. Glacier Bay expects to operate the vessel in Hawaii and the South Pacific during winter seasons.

Matt Nichols, president of the building yard, said that the vessel will be the largest cruising catamaran ever built in the U.S., and may well be unique among world cruise ships.

Accommodations in the triple-deck vessel will include a forward view lounge on the main deck.

The dining room aft will have full sitdown meal service from a well-appointed galley.

For further information on the full services and facilities offered by Nichols Brothers Boat Builders,

Circle 69 on Reader Service Card

Thomson-Gordon Introduces New Acrylic Adhesive For Bonding Thordon Elastomeric Bearings —Literature Available

A new acrylic adhesive, called TG-6, has been introduced by Thomson-Gordon Limited of Burlington, Ontario, Canada, for bonding its Thordon elastomeric marine bearings and bearing materials to a wide range of backing metals, including steel and nonferrous metals.

The adhesive is primarily intended for the installation of Thordon propeller-shaft and rudder-shaft bearings by shipyards, large boatbuilders and marine and fishing-boat repair depots. Depending upon the application, the bearing or bearing staves can be bonded to the shaft housing rather than being shrink fitted using dry ice or liquid nitrogen.

TG-6 provides room-temperature curing and gives, according to the manufacturer, an exceptionally strong bond, resistant to oil and water. The surface should be cleaned and the activator applied. The adhesive is then applied and the joint made and tightly clamped for two to five minutes at 23° C (77° F), when handling strength is achieved. Working strength is reached in 60 minutes, full strength in 24 hours.

For further literature containing full information,

Circle 39 on Reader Service Card

Instruments, Computers, Controls Corp. Offers Vessel Owners New Cost-Saving Equipment

Instruments, Computers, and Controls Corporation provides ships, riverboats, and tugboats with hi-tech computer products such as the company's patented product "The Digital Torque Meter System." This product measures horsepower, torque, and rpm for fuel conservation and information-gathering that plugs directly in the I.B.M. P.C. or compatibles.

The firm provides software, hardware, interfacing, installation, and service for marine applications. Fiber optic sensors and cabling will reject noise problems occurring from generators, and communication systems.

Systems monitor as many instruments or other devices necessary at one location for safety and information accumulation.

For further information on the new cost-saving equipment from Instruments, Computers, and Controls Corporation,

Circle 84 on Reader Service Card

Tri-Tex Introduces Fitz-Wright Handy Elevated Lifting Package —Free Literature Available

Tri-Tex Marine Inc., a subsidiary of Baldt Inc., recently introduced the new Fitz-Wright Handy Elevated Lifting Package (H.E.L.P.).

The Handy Elevated Lifting Package (H.E.L.P.) accompanies the worker to the job site and provides safe aerial and confined entry rescues.

The H.E.L.P. system consists of a heavy duty fire-resistant nylon harness, seat belt webbing, buckles, and associated rope and block attachments. For aerial rescues, these attachments are self-contained in a carrying bag; for confined entry rescues, the attachments are self-contained in a metal box secured to the ladder. All H.E.L.P. system components meet or exceed C.S.A. standards.

In confined entry applications, the guide bar of the harness prevents the victim from twisting and being caught in the ladder rungs or the manhole during the life procedure. The mechanical advantage of the top block system reduces the entire rescue operation to less than four minutes for one rescuer.

For further information on the H.E.L.P. system,

Circle 101 on Reader Service Card

Newest SSB Radiotelephones Offered By Hull Electronics —Free Brochure Available

Hull Electronics Company of San Diego, Calif., recently announced the latest SSB radiotelephones available to the marine marketplace. Latest state-of-the-art electronics provide a special Random Access Memory (RAM) to store individual channels. The units are designed to provide clear, dependable communications between ships, and from ships to private or public shore stations. The Model 924 features a built-in automatic antenna tuner.

For complete details and a free brochure,

Circle 76 on Reader Service Card

Stork Moves Service And Repair Shop To Schiedam

Stork-Werkspoor Diesel bv (SWDiesel) of Amsterdam has moved its Service and Repair Workshop, formerly located in Rotterdam for the past 25 years, to the Wilhelminahaven in Schiedam, The Netherlands. All service and repair work for The Netherlands and Belgium will now be carried out at the new location, which covers approximately 3,000 square meters.

One of the major considerations for moving to this new location was to have deep water adjacent to the workshop. The Wilhelminahaven, located on Holland's major waterway between Rotterdam and Europoort, enables customers to moor their vessel next to the new building, where the water depth is more than seven meters (23 feet) at SWDiesel's own pier.

For further information on SWDiesel's new repair facility,

Circle 57 on Reader Service Card

Free 12-Page Full-Color Brochure Offered By Baldt

Baldt Inc., Chester, Pa., has published a new 12-page four-color facilities brochure detailing the company's recent reorganization.

Entitled "Baldt Charts a New Course," this brochure highlights the responsibilities and long-term goals of Baldt's three new operating divisions. These new divisions are marine products, safety products and systems, and distribution.

James Palmer, Baldt president, said: "For most of its history, Baldt has manufactured and sold high-quality proprietary marine products to the U.S. shipbuilding industry, and most recently to the offshore drilling industry. This brochure reflects our commitment to these traditional markets. It also emphasizes our goal to aggressively seek new markets to expand our capabilities."

The brochure also details Baldt's product lines, testing capabilities, application data, and product certifications.

For a free copy of the brochure,

Circle 92 on Reader Service Card

Fleet Data Service Offers new Edition Of 'Offshore Service Vessels'

The ninth annual edition of "Offshore Service Vessels—A Guide to the American Fleet" has just been published by Fleet Data Service. This comprehensive directory to the American fleets and vessels serving the offshore petroleum industry includes 100 fleets operating 1,061 vessels measuring 150 LOA and larger, 180 fleets operating 1,340 smaller vessels under 150-ft. LOA, and 13 fleets operating 104 self-elevating liftboats.

Vessels are grouped by owner/operating fleet. In addition to standard directory information on the fleet, each vessel is listed with details of its operational capabilities. Specific information on each vessel includes the current name, type, flag, year built, length overall, total continuous horsepower, number/make/model of main engines, towing/anchor-handling winch capacity, dimensions of clear deck space, fuel oil tankage, potable water tankage, drill water tankage, total volume of dry bulk pressure tanks, liquid mud cargo capacity, etc.

Indexes and appendices provide easy access to name changes, vessel operators, and manufacturer's engine ratings. Additional listings identify unsold shipyard stock vessels, attrition from the fleet during the year, and vessels stacked and for sale by investors who are not operators. tables give a statistical breakdown of the entire fleet by size, type, horsepower, age, etc.

Founded in 1974, Fleet Data Service has been serving the information needs of fleets, yards, manufacturers and suppliers worldwide with custom market studies, annual directories and newsletters on the tug and OSV fleets. The year-end 1985 OSV edition is now available, at $150 per copy. For immediate shipment contact Fleet Data Service, P.O. Box 2576, Nacogdoches, TX 75963-2576 (telephone: 409/569-0375), or

Circle 8 on Reader Service Card

Hudson Engineering Plans Study Of Offshore Platforms For 1,600-Foot Water Depths

Hudson Engineering Corporation is planning to initiate a study of composite leg platforms for 1,600-foot water depths. The study will develop technical and cost data for a drilling/production platform and a drilling/wellhead platform for environments like those found in the Gulf of Mexico, as well as generate two field development schemes for using CLPs.

"The study will provide decision-making data for economic evaluations of deepwater leases in the Gulf of Mexico," said **Stephen A. Will,** manager of Hudson's Development Department. "The results will also be applicable to waters around the world with similar characteristics."

Study participants will share resulting critical data concerning deepwater concepts and the cost information on all phases of operations, from design to fabrication, transportation, and installation.

The project is estimated to cost a total of $840,000. It is scheduled to start in February this year and be completed in early 1987. For further information on the project,

Circle 48 on Reader Service Card

Black Elected President And CEO Of ARO Corp.

Todd Shipyards Corporation recently announced that **David Black** was elected by the board of directors to the position of president and chief executive officer of The ARO Corporation, a wholly owned subsidiary of Todd. In addition, the board elected **John T. Gilbride,** Todd chairman, to the position of chairman of ARO.

Mr. **Black,** a director of ARO since 1982, has been executive vice president of ARO since July 1984 and prior to that was vice president of marketing and product research and development engineering since December 1974. Before joining ARO, Mr. **Black** was marketing manager for international operations for the Tool Group of Dresser Industries.

Mr. **Black** holds a B.S. degree in industrial engineering from Texas A & M University. He is president of the American Supply and Machinery Manufacturers Association Inc., a trustee of the Fluid Power Educational Foundation, and a member of the industrial advisory committee of the Industrial Distribution Program at Western Carolina University of Cullowhee, N.C.

Todd Shipyards Corporation, one of the nation's leading ship construction and repair companies, operates shipyards in Seattle, San Francisco, Los Angeles and Galveston. Its recently acquired ARO subsidiary is an international manufacturer of industrial air-powered equipment and aeronautical and environmental life support systems.

Ciserv And ScanMarine Form New Joint Venture Ship Repair Service

Ciserv AB of Gothenburg and ScanMarine Services BV/ScanMarine Trading BV of Rotterdam has agreed to collaborate in a new, jointly owned company—Ciserv Rotterdam BV. Ciserv will buy 50 percent of ScanMarine; at the same time the name will be changed to Ciserv Rotterdam.

The partners foresee positive developments arising from the merger, and the new company will become part of Ciserv's international organization. The company's managing director will be **Barry Solaas,** present owner and managing director of ScanMarine Services/ScanMarine Trading. The new company's goal is to give all customers, old and new, the very best possible service, based upon the two companies' considerable experience within the marine sector.

Ciserv AB is a wholly owned subsidiary of Cityvarvet AB in Gothenburg, specializing in ship repair service in ports and at sea. The company is headquartered in Gothenburg, with service facilities also in the U.K., Singapore, and Norfolk, Va.

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Aluminum Boats Delivers Unique Mini-Crewboat To Five Star Marine Service

An all-aluminum crewboat delivered recently by Aluminum Boats, Inc. of Crown Point, La., to Five Star Marine Service of Belle Chasse, La., the Joe Lynn II (shown), is described by Five Star president **Clyde A. Giordano** as "a 50-foot crewboat that has the look, feel, ride, and performance of a much larger boat." The new boat's design is a joint effort by **Cameron Thompson,** Aluminum Boats' design consultant, and Mr. **Giordano.**

Some of the innovative design and Joe Lynn II's "bigness" is apparent inside because of its space and unusual amenities. Twelve passenger seats were sacrificed to provide additional room and comfort for 18 passengers and a crew of two. While most crewboats in this category have a depth of about five feet, the Joe Lynn II has a depth of 6 feet 10 inches, providing a smoother, more comfortable ride.

Propulsion is provided by twin Caterpillar 3408TA diesel engines developing a total of more than 850 bhp at 1,800 rpm, driving through Twin Disc 514 reverse/reduction gears, giving a cruising speed of 27 knots. The engines and support services were supplied by Boyce Machinery, Caterpillar distributor for Louisiana.

The Joe Lynn II is working for Shell Pipeline Corporation of Venice, La., on a contract Five Star Marine Service has held for 23 years.

For further information on the Aluminum Boats yard,

Circle 67 on Reader Service Card

JOE LYNN II
Major Suppliers

Main engines (2)	Caterpillar
Reduction gears (2)	Twin Disc
Propeller shafts	Aquamet
Bearings	Cutless
Steering	Wagner
Engine controls	Morse
Anchor	Danforth
Genset	Westerbeke
Aircon/heating	Duratherm
Hot water heater	Sears
Sanitation system	Mansfield
Radars (2)	Furuno
SSB radio	Stephens
VHF radio	Horizon
Loran C	Sitex/Koden
Depth sounder	Sitex
Loudhailer	Regency
(Electronics supplied by Frank L. Beier Radio)	
Compass	Ritchie
Bilge pump & searchlight	Jabsco
Water pump	PAR
Strainers	Groco
Interior lighting	Pauluhn
Paint systems	PRS
Seating	Eacco
Lifeboat	Plasticraft
Horn	Signaltone
Windshield wipers	American Bosch

New Free Catalog Available On Waveguide Components For Marine Radar Application

Space Machine & Engineering Corporation of St. Petersburg, Fla., has available an expanded line of standard waveguide components for marine radar application. New items include 20 dB bidirectional crossguide couplers and high, medium and low-power terminations in small X and large X bands; and a repair or replacement service for SX band rotary joints.

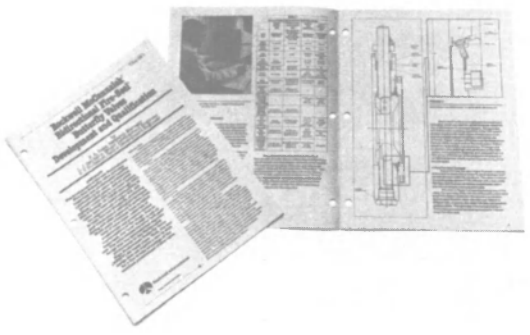
These are included in an updated catalog that also contains such components as formed and cast waveguide bends, straight sections and twists; flexible waveguide; flanges; deck and bulkhead thru-fittings; waveguide to coax adapters and 20 dB directional couplers—all in both SX and LX bands.

For a copy of the new catalog,

Circle 32 on Reader Service Card

$33-MILLION RECONSTRUCTION AT TODD—The 700-foot Matsonia, a Matsonia Navigation Company roll-on/roll-off trailership, departs for Los Angeles Harbor under tow from Oakland. The vessel is en route to Todd-Pacific's San Pedro yard for a $33-million reconstruction that will lengthen it to 760 feet and triple its cargo capacity. Matsonia will be converted to a combination lift-on/lift-off container carrier and RO/RO-trailership, and return to West Coast/Hawaii service next spring. She was towed into bay stern first and turned around to be towed bow first for the three-day trip to San Pedro.

Rockwell Offers Free Technical Article On Fire-Seal® Butterfly Valves



The Flow Control Division of Rockwell International has published a new technical article, "Rockwell McCannalok® Bidirectional Fire-Seal® Butterfly Valves Development and Qualification."

The 12-page technical article describes the development and test program of Rockwell's new bidirectional Fire-Seal butterfly valves.

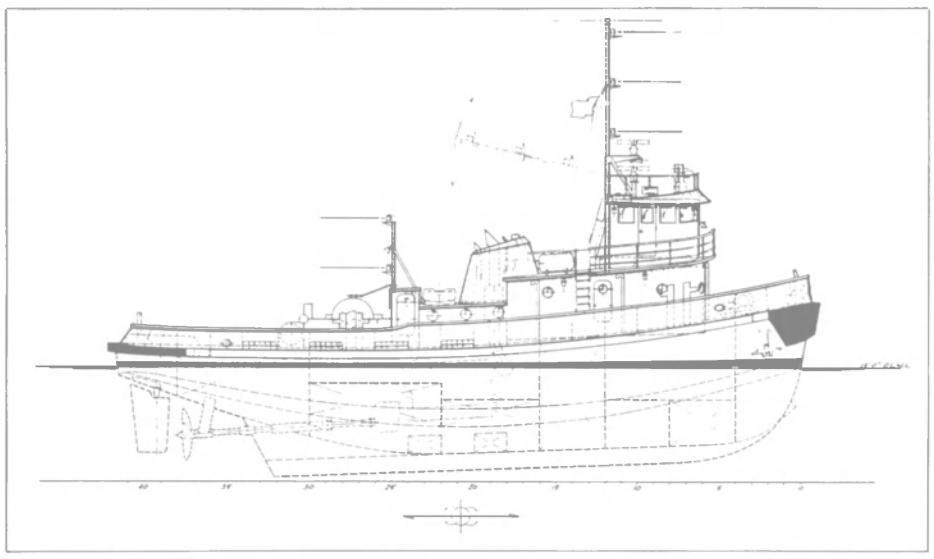
According to the publication, these new fire-tested valves provide important new performance benefits (particularly for users in refineries, petrochemical plants and oil patch regions) where fire is a serious hazard.

Size 3 through 16 valves have been successfully tested to the requirements of major U.S. and British fire test standards, predicting good bidirectional sealing performance before, during and after exposure to severe fires.

The Flow Control Division of Rockwell International is a leading supplier of high-technology industrial valve and actuator products for worldwide electric power, oil and gas, chemical process and general industrial markets.

For a copy of the technical article from Rockwell International's Flow Control Division,

Circle 54 on Reader Service Card



Martinac-Built Tug For Boyer Powered By Stork Diesels

Boyer Towing, Inc. of Ketchikan, Alaska, will take delivery in April this year of a new 86-foot, twin-screw tug under construction at Martinac Shipbuilding Corporation in Tacoma, Wash. The 1,800-bhp vessel, with a beam of 25.5 feet and depth of 15 feet, was designed by Glosten Associates of Seattle.

Two six-cylinder Stork-Werkspoor FHD-240 diesel engines will each provide 900 bhp at 900 rpm. They will drive twin propellers via Masson reverse/reduction gears. The engines were sold through the Seattle office of SWDiesel Gulf, Inc., which is headed by West Coast sales manager **Charles Garman**. The French-built Masson gears were supplied through Diesel Power International of New Orleans.

Last year Boyer had an existing tug, the Brenda H., repowered with a Stork-Werkspoor 9FHD-240 diesel with Masson reverse/reduction gears. Since then that vessel has been operating in barge and log raft towing in Southeastern Alaska.

Electric power for the new vessel at Martinac will be provided by a 30-kw Ford/Onan generating set and a Lister 8-kw auxiliary generator. The tug will have a capacity for 28,700 gallons of fuel oil, 800 gallons of lube oil, and 2,000 gallons of fresh water.

For free literature on Martinac Shipbuilding facilities and services,

Circle 12 on Reader Service Card

For literature on Stork Diesel Engines,

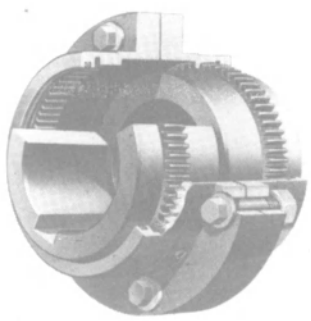
Circle 14 on Reader Service Card

Falk Crowned Tooth Gear Couplings Cut Application Costs

Savings averaging 15-20 percent on a project basis are claimed for selecting Falk's 1000G crowned tooth gear couplings compared with smaller-bore designs. According to The Falk Corporation, the 1000G series has the largest bore on the market, permitting the same size coupling to be used on a larger shaft or a same size shaft.

The coupling also features Falk Long Term Grease (LTG), which eliminates routine lubrication cycles for up to three years. Location of the lubrication hole in the sleeve assures that an adequate grease reservoir will be maintained close to the gear mesh.

Falk's 1000G couplings are also half-for-half interchangeable with all standard gear couplings, and replacement half couplings are reported to provide additional hub strength and lower gear mesh loads. Grade 8 fasteners are used for added strength, while Prevailing Torque Locknuts (PTL) eliminate the need for lockwashers. Nonturning locknuts permit installation with only one wrench. Exposed bolt design is furnished as standard. Shrouded bolt design is available for sizes 1010 through 1055 when specified.



1000G coupling (exposed bolt design).

Available in coupling sizes, the 1000G series offers maximum bore capacities from 1.875 to 10.000.

The Falk Corporation, a subsidiary of Sundstrand Corporation, is a leading manufacturer of standard and custom design gear drives and flexible couplings.

For additional information,

Circle 64 on Reader Service Card

Circle 320 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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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 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.**

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Borg-Warner Air Conditioning, P.O. Box 1592-361C, York, PA 17405
Flakt AB, Box 8862, S-40272, Gothenburg, Sweden
Mechanical Resources Inc., 210 West Side Ave., Jersey City NJ 07305
Stal Refrigeration AB, Butangsgatan 16, S 601 87 Norrkoping, Sweden
United Technologies, Carrier Transicold Division, P.O. Box 4805, Syracuse NY 13221

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G.J. Wortelboer Jr. B.V., Eemhavenstraat 4, P.O. Box 5003, 3008 AA Rotterdam, Netherlands

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Federal Harco, P.O. Box 40310, Houston, TX 77240
Saphire Technology, Inc.; 9370 Sunset Dr., Suite A215, Miami FL 33173
Thermal Reduction Company, 1 Pavilion Avenue, Riverside, NJ 08075
Wilson, Walton International, Inc., 66 Hudson St., Hoboken, NJ 07030

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

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Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
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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
Clemco, P.O. Box 7680, San Francisco CA 94120
Inventive Machine Corp., P.O. Box 369, Bolivar, OH 44612

BOILERS
Aalborg Vaerft, P.O. Box 661, DK-9100 Aalborg DENMARK
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

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MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016

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NKS Industria Pesada, Grupo Industrial, Reforma 404, 140 Piso, Mexico, D.F. 06600 U.S. REP.—Lexington International Trading, Inc., 551 Fifth Ave., Room 910, New York N.Y. 10017

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Veson Systems, 29 Broadway, Suite 1002, New York, NY 10006

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Wright Austin Co., 3245 Wight St., Detroit MI 48207

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ASEA, Inc., 4 New King St., White Plains, NY 10604
Bailey Controls, 29801 Euclid Avenue, Wickliffe, OH 44092
Barringer Research, 304 Carlingview Dr., Rexdale, Ontario, Canada M9W 5G2
Cooper Energy Services, Mount Vernon, OH 43050
Ergon, Inc., P.O. Drawer 1639, Jackson, MS 39205
Indikon Corp., 26 New St., Cambridge, MA 02138
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Leslie Co., 401 Jefferson Rd., Parsippony, NJ 07054
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

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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
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McElroy Machine & Mfg. Co., Inc., Lorraine Rd., Industrial Seaway, Gulfport, MS 39501

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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—CYUNDER LINERS
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, MA 02360
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn NY 11231
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

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
BMV Bergen Diesel A.S., P.O. Box 924, N-5001 Bergen NORWAY; 2110-10 Service Rd., Kenner LA 70062
Caterpillar Tractor Co., Engine Division, 100 N.E. Adams St., Peoria IL 61629
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
Goltens, 160 Van Brunt Street, Brooklyn, NY 11231
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Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166
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
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
Sunbelt Energy Systems, Inc., Park Square, 2105 Park Ave., Suite 14, Orange Park, FL 32073
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
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
Daito Engineering Co., Ltd., 10-23 Kawaguchi, 3-chome, Nishi-ku, Osaka JAPAN
Genstar Stone Products Co., Executive Plaza IV, Hunt Valley, MD 21031
Hossfeld Manufacturing Co., P.O. Box 557, Winona MN 55987
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, NY 10550
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302
Marketec, Inc., 27 Bowers Lane, Chatham NJ 07928
Nicolai Joffe, P.O. Box 5362, 9171 Wilshire Blvd., Beverly Hills, CA 90210
Raytheon Service Company, 100 Roester Rd., Suite 103, Glen Burnie, MD 21061
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
Atlas-Danmark Marine & Offshore, Baltorpvej 154, KD-2750 Blierup, 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
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
Action Threaded Products, Bridgeview IL 60455
Hardware Specialty Co., Ships Division, 48-75 36th St., Long Island City, NY 11101

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., Clearbrook Industrial Park, P.O. Box 98, Clearbrook VA 22624

FILTERS
Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307
Parker Filter Division, 16810 Fulton County Rd., #2, Metamora, OH 43540

FINANCING—Leasing
JMJ Marine Investors Corp., 1525 River Oaks Rd East, Marahan LA 70123

FIRE PROTECTION, DETECTION & ALARM SYSTEMS
Formica Corp., One Cyanamid Plaza, Wayne NJ 07470
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
McTigue Industries Inc., 1615 9th Ave., Bohemia, NY 11716

FURNITURE
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
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

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

HATCH & DECK COVERS—Chain Pipe
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

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
Vapor Corp., 6420 West Howard St., Chicago IL 60648

HULL CLEANING
Aurand 1270 Ellis Street, Cincinnati, OH 45223
Petroferm Marine, Route 2, Box 280, Amelia Island, FL 32034
Phosmarine Equipment, 21 Bd. de Paris, 13002, Marseille, France
Seaward Marine Service, Inc., 201 N. Union Street, Alexandria, VA 22314
Seaward Marine Service, Inc. 5409 Beamon Rd., Norfolk, VA 23513 TX: 710-881-1182
Seaward Marine Service, Inc. 424 West 8th Street, National City, CA 92050
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
Parker Hannifin Corporation, 17325 Euclid Avenue, Cleveland, OH 44112
Titeflex Corporation, P.O. Box 54, Springfield, MA 01109
Washington Chain & Supply, Inc., P.O. Box 3646, Seattle, WA 98124

INERT GAS
Saab Tank Control, One Harmon Plaza, Secaucus NJ 07094

INSULATION—Cloth, Fiberglass
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
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., 2323 Randolph Avenue, Avenel, NJ 07001
Masonite Commercial Division, Dover, OH 44622
Walz & Krenzer Inc., 725 Glen Cove Ave., P.O. Box 6, Glen Head NY 11545

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
Carlisle & Finch, 4562 W. Mitchell Avenue, Cincinnati, OH 45232
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
American Piping Products Inc., Box 1056, New Hyde Park, NY 11040
Stacey/Fetterolf Corp., P.O. Box 103, Skippack, PA 19474

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL-MARINE
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

METAL MARKER
J. P. Nissen Company, P.O. Box 188, Glenside PA 19038

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
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Hydromath Inc., Box 2450, Danby-Pawlet Road, Pawlet, VT 05761
Ameritech Corporation, 7 Belver Avenue, Suite 215, N. Kingston, RI 02852
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.D.I. Marine Co., 5520 Los Santos Way, Suite 600, Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829
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
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
Engineering Visions, 1111 Bay Blvd., Chula Vista CA 92011
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
JJH Inc. of Virginia, 330 County St, Portsmouth VA 23704
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Jantzen Engineering Co., 6655-H Amberton Drive, Baltimore, MD 21227
James S. Krogen, 1515 NW 7th St., Suite 124, Miami FL 33125
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
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 Power Associates, 1010 Turquois St., Ste 217, San Diego, CA 92109
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 Inc., 12200 Sunrise Valley Dr., Reston VA 22091
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
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, FL 33156
O.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 Corp., 520 Fellowship Rd., Ste C306, Mt. Laurel NJ 08054
STV/Sonders & Thomas, Inc., 1745 Jefferson Davis Hwy., Arlington, VA 22202
Seaworthy Systems Inc., 28 Main St., Essex CT 06426; 17 Battery Pl., New York, NY 10004; P.O. Box 205, Solomons MD 20688; 2 Skyline Pl, 5203 Leesburg Pike, Falls Church VA 22041
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
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
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, 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
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
Naval Electronics, 5479 Jetport Industrial Blvd., Tampa FL 33614
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-Shipmate, 400 Oser Ave., Hauppauge NY 11788
S.P. Radio A/S, DK 9200 Aalborg, Denmark
SAIT Inc., 33 Rector St., New York, NY 10006
Simrad, 2208 NW Market St., Seattle WA 98107
Sperry Corporation, Rte 29 North, Charlottesville, VA 22906
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Telesystems, 2700 Prosperity Ave., Fairfax, VA 22031 USA
Tracor Instruments Austin Inc., 6500 Tracor Lane, Austin, TX 78725

OILS—Marine—Additives

B P North America Petroleum, 555 US Route 1, So. Iselin, NJ 08830
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, Hockensack, 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

OIL/WATER SEPARATORS

Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
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
Sigma Treatment System, Merry Meadows RD 1 Box 70, Chester Springs, Pa 19425

PAINTS—COATINGS—CORROSION CONTROL

American Abrasive Metals Co., 460 Coit St., Irvington NJ 07111
Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754
Devoe Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207
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 Dorby 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
Ameron Fiberglass Pipe Division, P.O. Box 801148, Houston TX 77280
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
Willcox, P.O. Box 484, Garfield NJ 07026

PLASTICS—Marine Applications

Hubeva Marine Plastic, Inc., 390 Hamilton Ave., Brooklyn, NY 11231

PROPELLER POUSHING

Aquafacs Marine Technical Services, Pier One, Berth One, Boston MA 02128
Pacific Marine Services, P.O. Box 3400, Terminal Island, CA 90731

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines

Allison Gas Turbine Division, General Motors Corp., P.O. Box 420 Speed code U6, Indianapolis, IN 46206
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
BMV Bergen Diesel A.S., P.O. Box 924, N-5001 Bergen NORWAY; 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 Tractor Co., Engine Division, 100 N.E. Adams St., 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
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505
General Motors, Electro-Motive Division, LaGrange, IL 60525
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231
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, 10450 Corporate Dr., Sugarland, TX 77478
MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
Mitsubishi International Corporation, 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 Porsippany 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
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
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
Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072

PUMPS—Repairs—Drives

Allweiler Pump Inc., 5410 Newport Dr., Rolling Meadows, IL 60008 TX: 270-0444
Cat Pumps Corp., 1681 94th Lane NE, Minneapolis MN 55434
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL-MARINE
FMC Coffin Turbo Pump, 326 S Dean St., Englewood NJ 07631
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
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
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

REFRIGERATION—Refrigerant Valves

Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
Grasso, Inc., 1101 N. Governor Street, P.O. Box 4799, Evansville, IN 47711-0799
United Technologies, Carrier Transicold Division, P.O. Box 4805, Syracuse, NY 13221

ROPE—Manila—Nylon—Hawsers—Fibers

A.L. Don Co., Foot of Dock St., Matawan, NJ 07747
Allied Fibers, 1411 Broadway, New York, NY 10018
Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008
Tubbs Cordage Company, P.O. Box 709, Orange, CA 92666
Tubbs Cordage Co., P.O. Box 7986, San Francisco, CA 94120-7986
Vermeire N.V. Industripark Zwaarveld, B-9160 Hamme, Belgium TX: 21687

SANITATION DEVICES—Pollution Control

Davit Sales Inc., P.O. Box 232, Jefferson Valley, NY 10535
Envirovac Inc., 1260 Turret Dr., Rockford, II 61111
Fast Systems Inc., 1717 Sualette Ave., St. Louis MO 63110
Golar Metal A/S, P.O. Box 70, 4901 Tvedestrand, Norway

SCAFFOLDING EQUIPMENT—Work Platforms

McCausey Lumber Co., 7751 Lyndon, Detroit, MI 48238

SCUTTLES/MANHOLES

Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

SHAFT SEALS, MECHANICAL PACKING

EG&G Sealol Engineered Prod. Div. Marine Products Group, Warwick, RI 02888
Garlock Inc., Mechanical Packing Div., 1666 Division St., Palmyra, NY 14522

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

SHIPBUILDING EQUIPMENT

Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA. 93116
M.A.N.—GHH Sterkrade Werfsrabe 112 D-4100 Duisburg 18, West Germany
Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, FL 33156
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

SHIPBUILDING STEEL

Armco Steel Corp., 703 Curtis St., Middletown, OH 45042
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
High Strength QA Steel, P.O. Box 40606, Houston, Tx 77240-0606
Welded Beam Company, P.O. Box 280, Perry, OH 44081

SHIPBUILDING—Repairs, Maintenance, Drydocking

Arsenale Triestino-San Marco Shipyard, Trieste, Italy, U.S. Rep: Marine Technologies & Brokerage, 33 Rector St., New York, NY 10066
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
Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA 93116
Bath Iron Works Corp., 700 Washington St., Bath, ME 04530
Bay Shipbuilding Corp., 605 N. 3rd Ave., Sturgeon Bay, WI 54235
Bender Shipbuilding & Repair Co., Inc., P.O. Box 42, Mobile, AL 36601
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
Blohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1 (In US)-Blohm & Voss CO, Springfield, N.J.
Blount Marine Corp., P.O. Box 368, Warren, RI 02885
Boston Whaler Commercial Div., 1149 Hingham St., Rockland MA 02370
Brodosplit, Put Udarniku 19, P.O. Box 107, 58000 Split YUGOSLAVIA
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AWO President Calls For Board Formation To Set Waterways Spending Priorities

A major spokesman for the nation's barge and towing industry said that recent government action to drastically reduce the federal deficit greatly increases the need to establish a government-industry "Users Board," consisting of representatives from the various users and beneficiaries of the nation's inland and coastal waterways system.

"We have entered the Gramm-Rudman era," said **Joseph Farrell**, president of The American Waterways Operators, the national association for the barge and towing industry. Mr. **Farrell's** remarks recently were made in an address to the National Coal Association Transportation Seminar in Lexington, Ky.

"I firmly believe that the nation is on course to reduce the breathtaking federal budget deficit of recent years. And well it should be," Mr. **Farrell** said.

He said that in light of this current climate of greatly reduced federal spending, that "There should be in place an advisory board made up of waterway system beneficiaries to help government in setting its waterway construction and maintenance priorities."

For the barge industry, Mr. **Farrell** said that new restrictions on federal spending will require that "The priorities must be sharper and performance likely more drawn out," and that such an advisory board could realistically help keep the government aware of the waterway industry's specific needs.

Mr. **Farrell** proposed that the "Users Board," if created, would be most effective if it were required to report to the U.S. Senate and House Committees that are directly responsible for authorizing federal funds for the nation's waterways.

"What is certain, is that we must all become more efficient in the maintenance and construction of America's ports, waterways and rivers," Mr. **Farrell** said. "I do not pretend that this will be an easy or painless exercise. But we must undertake it," he said.

For further information on The American Waterways Operators, Inc., write to 1600 Wilson Blvd., Arlington, Va. 22209, or call (703) 841-9300.

'Comdev Marine 2000' Autopilot Available From Canadian Firm—Free Full-Color Brochure Offered

CompuNav Systems Ltd. of Vancouver, Canada, has made available a color brochure on its marine autopilot.

Since its introduction in 1982, the Comdev Marine 2000 Autopilot has gained a solid reputation in the commercial fishing industry for its unwaveringly reliable and trouble-free operations.

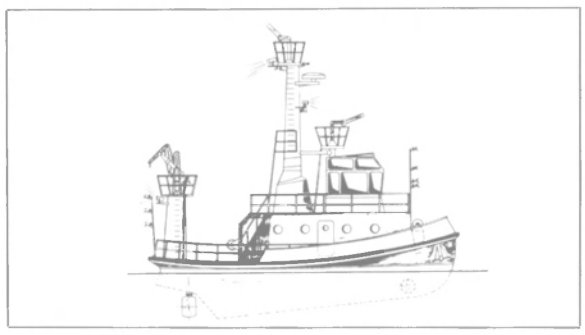
The system features an automatic trim that allows the autopilot to correct for the turning effect of the propeller, uneven loading, etc., keeping the vessel exactly on course.

At the flick of a switch, the large LCD display gives either the programmed course or the vessel's actual heading. The liquid crystal display is clearly visible in bright sunlight and is illuminated for night viewing.

For more information and a copy of the new 'Comdev Marine 2000' color brochure from CompuNav Systems,

Circle 41 on Reader Service Card

Rugged Fiberglass Service Vessel Offered By Ameritech Shipyard



Ameritech Corporation of North Kingston, R.I., has designed a 45-foot harbor service vessel intended primarily for firefighting, rescue, and salvage. With a beam of 14 feet and displacement of 29,000 pounds, the craft may also serve other purposes. Called Cyclops I by designers **H.R. Frazier** and **L.C. Babb,** the design is also available in a 38-foot tug/yacht configuration.

With two Volvo Penta TAND 70E 211-bhp diesel engines as main propulsion power, the vessel incorporates a 38-inch Harbor Master 3000 Kort nozzle and hydraulically operated Upton Marine bow thruster to provide the extra maneuverability needed in emergency situations.

The vessel's main tower mounts a Feecon water/foam turret cannon capable of discharging 500 gallons per minute at 100 psi with 360-degree capability. The tower stands 21½ feet above the fire bridge deck, and also services the midbridge water cannon, which is a Feecon remote/manual unit also rated 500 gpm at 100 psi, with 300-degree operation.

A box frame aft mounts two portable water cannons and also provides storage for additional fire/salvage equipment and serves as a foundation for a 5-ton folding crane for salvage or emergency use.

The design of Cyclops I is to traditional tug lines, with added ruggedness in the keel, fender area, and bow for commercial service. The standard hull and deck are constructed of extra-heavy alternating courses of unidirectional glass fiber and woven mat reinforcement on each side of 1-inch, end-grain balsa core. All through-hull fittins are solid fiberflass. Hull and deck joints are the double-flange type with stainless steel bolting. The superstructure, fire bridge, and control room are of rugged 5086 aluminum. The aluminum decks are treated to have a non-skid surface.

For additional information on the Cyclops I design.

Circle 81 on Reader Service Card

Jamesbury Introduces The New Low-Cost Series 3000 Ball Valves —Brochure Available

Jamesbury Corporation, a subsidiary of Combustion Engineering, Inc., and a leading manufacturer of valves, actuators and associated controls, has announced the introduction of the Jamesbury Series 3000 ball valve.

The Series 3000 ball valve is intended for general service in a wide range of process applications such as venting, draining, purging, bypassing, isolating in addition to many industrial and OEM applications. While the Series 3000 is economically priced, these valves offer the high performance and reliability demanded by safety-conscious plant managers and engineers.

There are eight sizes in the Series 3000 ball valve line, ranging from ¼- to 2 inches. The Series 3000 is a unit body, screwed end ball valve available in carbon steel or 316 stainless steel. Monel and hastelloy trim in conjunction with Teflon and Delrin seat materials are available for special applications. Depending on the choice of seat materials, the Series 3000 is pressure rated to 2,000 psi and temperature rated to 500° F (steam to 250° F). The valve is fire-tested to meet both API 607 and RP6F as well as British Standard 5146.

For more information and free literature on the low-cost, high-quality Series 3000 ball valve,

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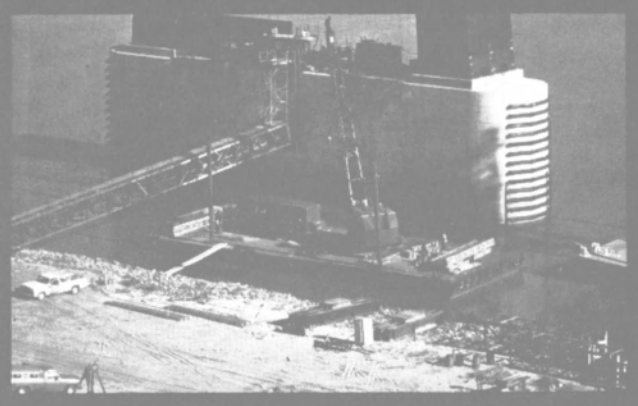

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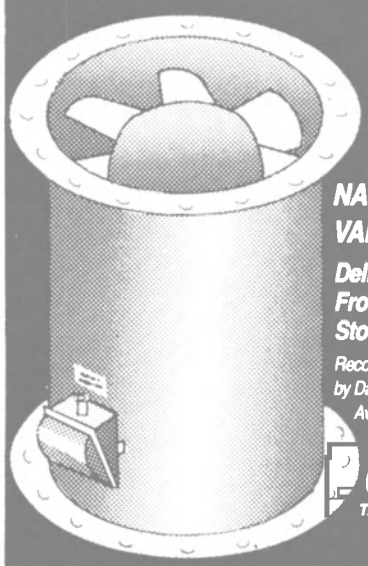

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DEPARTMENT OF ENVIRONMENTAL PROTECTION
Notice to Bidders

Sealed bids will be received by the City of New York—Department of Environmental Protection for Contract WP 284-30 Construction of 15,000 ton Ocean Going Barges to be used for removal of sludge, from New York City Water Pollution Control Plants.

Blank bid forms and contract documents (Fee $100) may be obtained on or about April 7th, 1986 from the:

Contract Division, DEP
346 Broadway, Room 828
New York, New York 10013
Tel. (212) 566-0885

Bids will be publicly opened and read at the same location at 11:30 A.M., **May 7, 1986**

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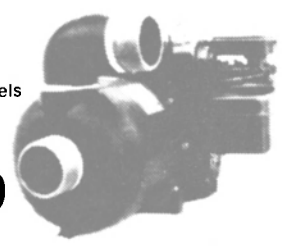

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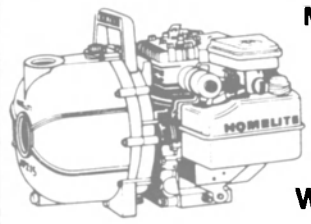

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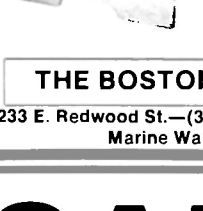

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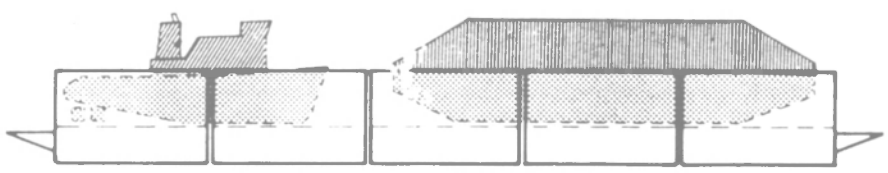

Lift capacity: 9,000 long tons
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Length overall: 514 feet
(156.7 meters).

Clear width: 92.7 feet
(28.3 meters).

Sectional pontoon design enables each of its five sections to operate independently. The dock is used primarily for tugs, barges, dredges, and small- to medium-sized vessels. Recent survey, located in U.S. Price negotiable. Contact:

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Telephone: 212/477-6700 Telex: 424768 MARINTI
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Halter Marine Launches Catcher/ Processor For Lund Fisheries

The Moss Point, Miss., yard of Halter Marine, a Trinity Industries company, recently launched the catcher/processor fishing vessel Atlantic Prince being constructed for Lund Fisheries of Cape May, N.J. The 150-foot boat had an extremely short engineering and building period—less than six months from contract signing to complete design to owner's requirements to launching, even with the disruptions of three hurricanes.

Propulsion for the twin-screw vessel is provided by two Caterpillar 3512 diesel engines with a total output of 1,800 bhp. Her 435-kw generators are driven by Cat 3412 engines.

The Atlantic Prince was christened by Mrs. **Evelyn Lund.** The principal partner in Lund Fisheries, **Warren Lund,** said that he is pleased with the design and workmanship on the vessel.

The Moss Point yard has a record of supplying fishing vessels for both the Pacific and Atlantic fisheries. The recent keel laying of the T-AGOS ocean surveillance vessel for the Navy and the launching of the Atlantic Prince show the adaptability of Halter Marine in building both military and commercial vessels in the same yard.

For additional information on Halter Marine,

Circle 100 on Reader Service Card

Lima Electric Introduces Line Of Single-Phase Alternators—Literature Offered

Lima Electric Company announced the availability of a new line of single phase alternators for marine and industrial service. Designed in the compact 282 frame, the new design provides superior single phase electrical performance in a rugged mechanical structure.

According to **Mike Spees,** marketing manager, "The patented excitation system based on proven MAC concepts provides excellent 120/240 V, 4 wire single-phase performance including 3 percent voltage regulation and .5 hp/kw electric motor starting capability. Inherently, the alternator provides 300 percent short circuit current plus a volts-per-hertz characteristic for underspeed protection."

"Mechanically, the 282 frame is designed for strength and compactness providing more kw/pound in a rigid cast aluminum frame and bearing carrier. The steel insert in the bearing carrier is machined to very close tolerances and has an 'O' ring insert to discourage wear and provide extended bearing operating life. All electrical components are moisture and fungus protected from adverse environments."

On shipboard, the MAC 282 frame provides reliable single phase power for lights, radio and navigation, winches, refrigeration, air conditioner, pumps and a host of other applications. On land, this same machine is ideal for light towers, communication stations and electric tools for construction as well as emergency applications for safety of life and property.

Available ratings range from 5 through 8.5 kw, single phase, in a single and two bearing configuration adaptable to all popular diesel and gasoline engines.

For further information and free detailed literature on Lima's new line of single phase alternators,

Circle 70 on Reader Service Card

Jotun Introduces New Modified Epoxy Brush-On Coating For Unshotblasted Steel Surfaces

Jotun has introduced a new two-pack modified epoxy coating specially formulated for application by brush, roller or spray, to steel surfaces that cannot be shotblasted or otherwise carefully prepared. Known as "Jotamastic," the new product can be applied over existing coatings of many kinds, and is suitable for overpainting by many other products.

Jotamastic contains aluminum, which helps to reflect heat, increases water resistance, and gives the coating a pleasing metallic-gray color. It has a high solids content of 86 percent by volume, and a dry film thickness of 200 micron is possible with a single coat on steel. The coating can also be used on concrete.

The new product can be readily applied by brush or roller provided the existing surface is reasonably clean and dry, and it will adhere to and upgrade the existing coatings, including weathered primers. It is also suitable for application by airless spray when thinned 15 percent by volume with suitable thinners.

Jotamastic is easily overcoatable and it dries to touch in five hours. It is ideal for cargo holds since it can overcoat the existing alkyd paints commonly used, thereby upgrading to an epoxy system. it is also approved by the North of England Industrial Health Services as an interior surface coating for the storage holds of grain transporters.

For further literature containing full information on Jotun marine Coatings,

Circle 33 on Reader Service Card

Siemens-Allis Changes Name To Siemens Energy & Automation —Color Brochure Available

Harry S. Burker Jr., president and chief executive officer of Siemens-Allis, has announced that, effective immediately, the company will be named Siemens Energy & Automation, Inc. The name change follows Siemens' purchase of Allis-Chalmers' remaining interest in Siemens-Allis last fall.

"The new name appropriately reflects Siemens' full ownership of our company, as well as our increasing involvement with the Siemens organization worldwide to optimize technological leadership," Mr. **Burker** said. "However, to our customers, we will be known simply as Siemens," he added.

Prior to the buyout, Siemens has gradually increased its ownership of Siemens-Allis since 1978 when it initially purchased 20 percent of what was then the Electrical Products Group of Allis-Chalmers. During that period, Siemens introduced a number of high-technology developments into the Siemens-Allis product line, which was further expanded in 1983 by the acquisition of the ITE electrical products business from Gould Inc.

Headquartered in Atlanta, Siemens Energy & Automation is a manufacturer of electrical and electronic equipment for marine electric utilities and general industry. The company has 24 plants in the U.S. and its products are marketed worldwide.

For further information and a free copy of a full-color brochure,

Circle 71 on Reader Service Card

Bids To Carry U.S. Military Cargo For Next Six Months Increase On Atlantic Route

The Military Sealift Command has reported that bids to carry U.S. military cargo for the next six months have increased on the North Atlantic route while declining on shipments to the Far East. Coming in with the low of $17.54 per measurement ton on containerized military cargo to Europe, United States Lines beat American Automar at $17.80 and Sea-Land Service Inc. at $18.16.

Low bidders on the Pacific routes were Sea-Land offering $13.67 and $12.49 for the Korea and Okinawa routes, respectively, and APL submitting rates of $11.24 and $6.73 for the Philippines and Japan. The Sealift Command said the decrease in Pacific rates was due to increased competition and lower fuel cost, but did not explain the hike on the North Atlantic routes.

Gen. **John Stanford** said APL, Sea-Land and Lykes Bros. Steamship Co. have been asked to support their assertions that containers could handle 80 percent of military cargo being moved during an emergency. He said the Command is dubious that containerships could handle more than 20 percent of the supplies required in an emergency, citing the sheer volume of cargo needed to support a division of 18,000 men on a move from the U.S. to, for example, Korea. He also noted that containerizing equipment like heavy tanks would be more than a little difficult.

Lykes, the only carrier so far to respond to the query, said it would use flatcars and RO/RO vessels to handle oversized cargo. Another carrier, USL, said it could not accommodate the move in that it does not have what it believes is the required bulk space available.

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- • **Diesel Engine Review**
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AUGUST 1986 DOUBLE ISSUE

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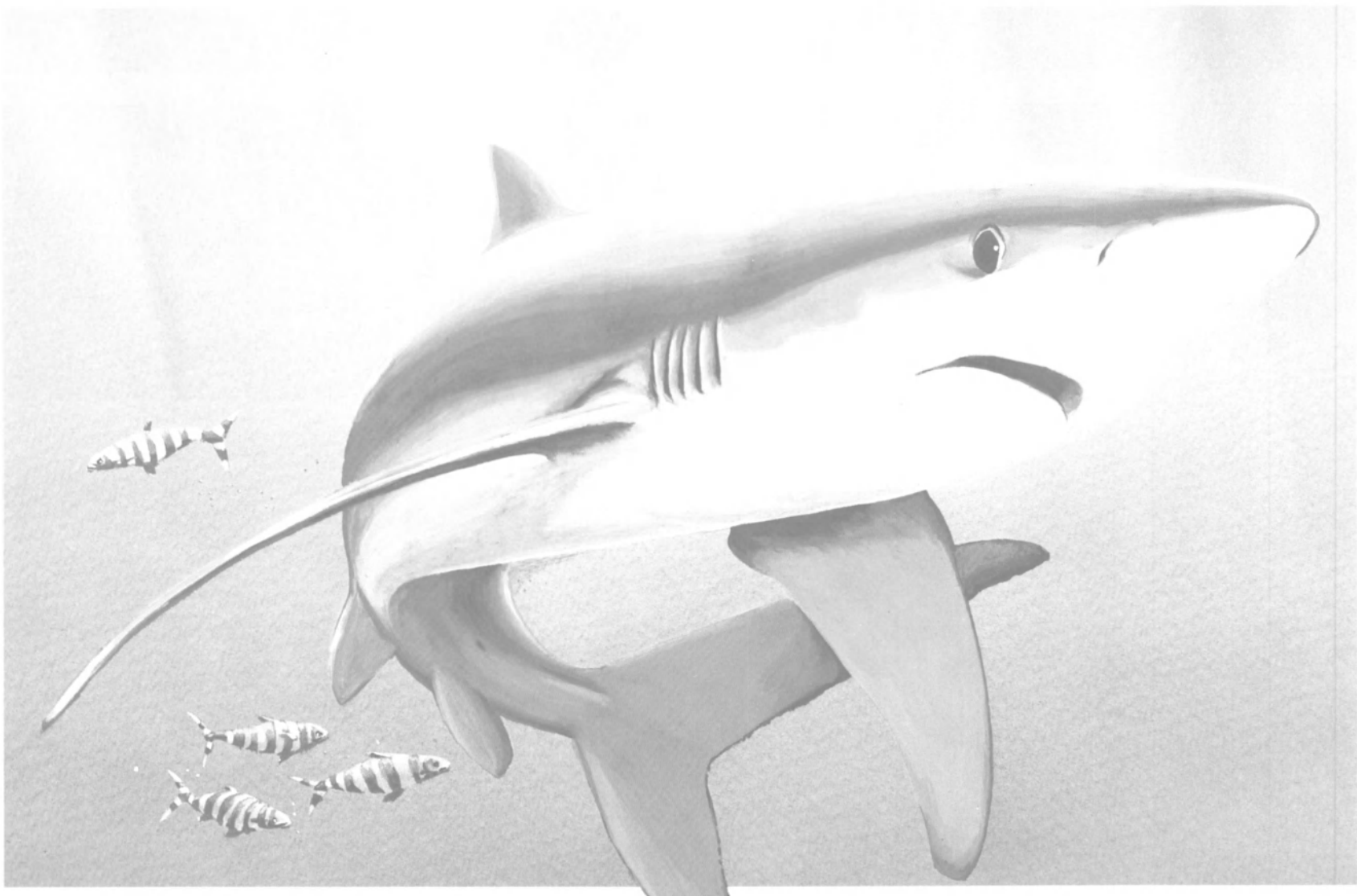

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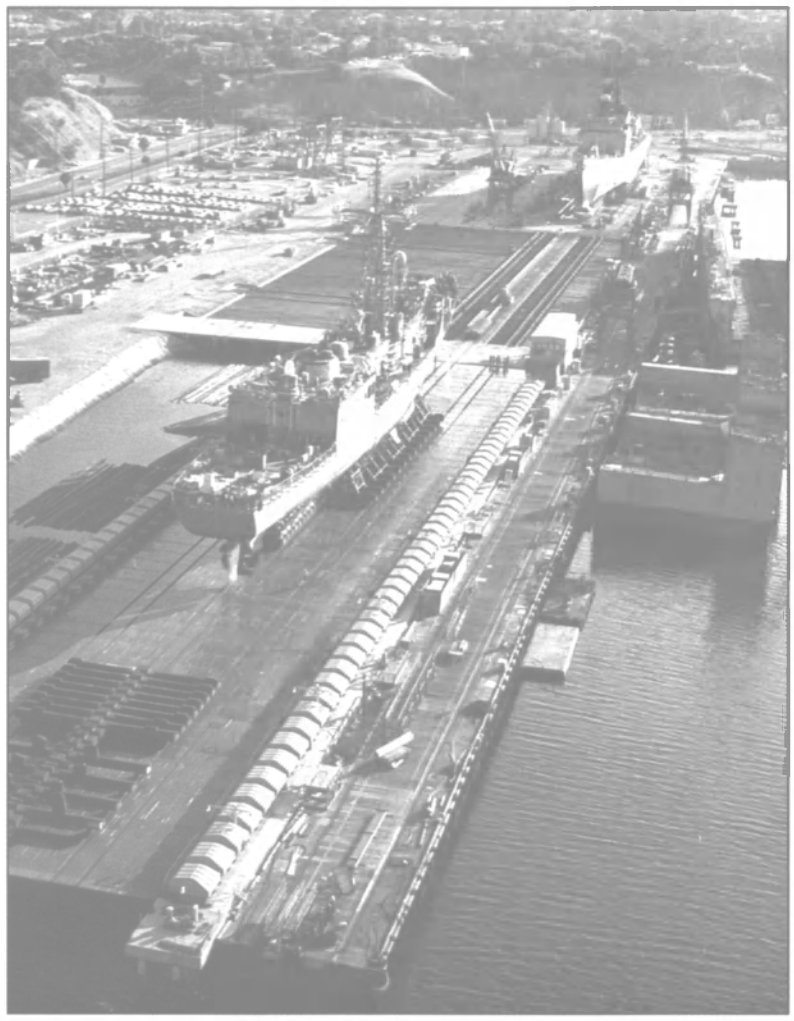
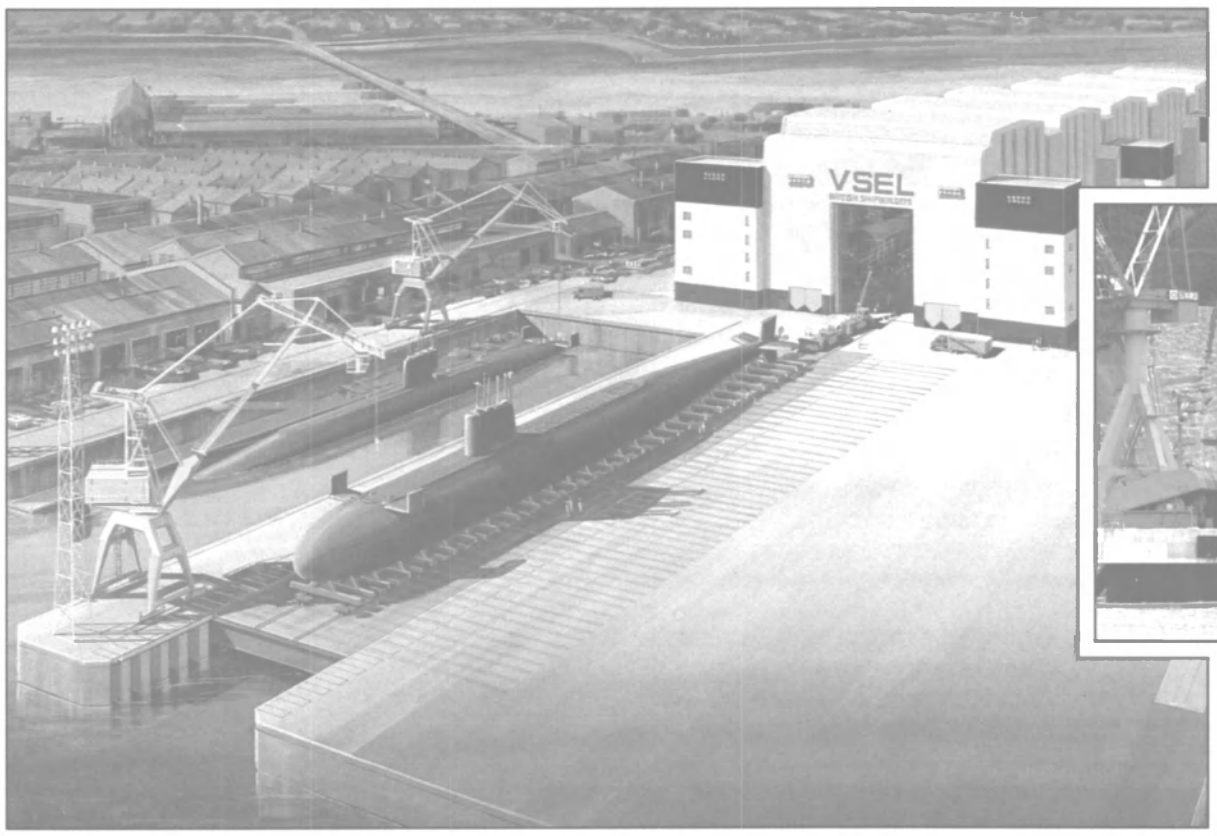


Photo by Joseph Ernest



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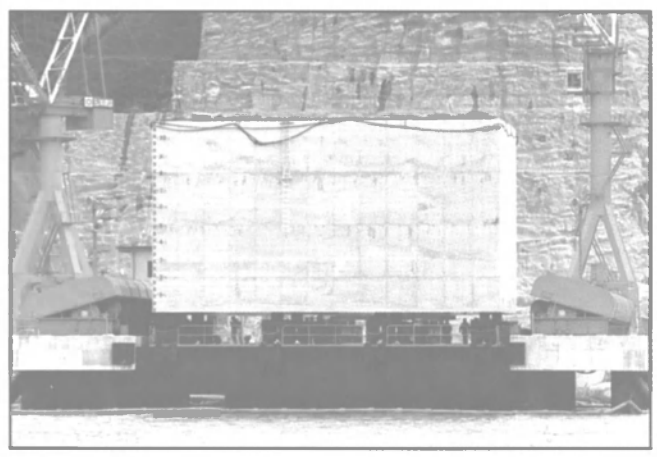

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