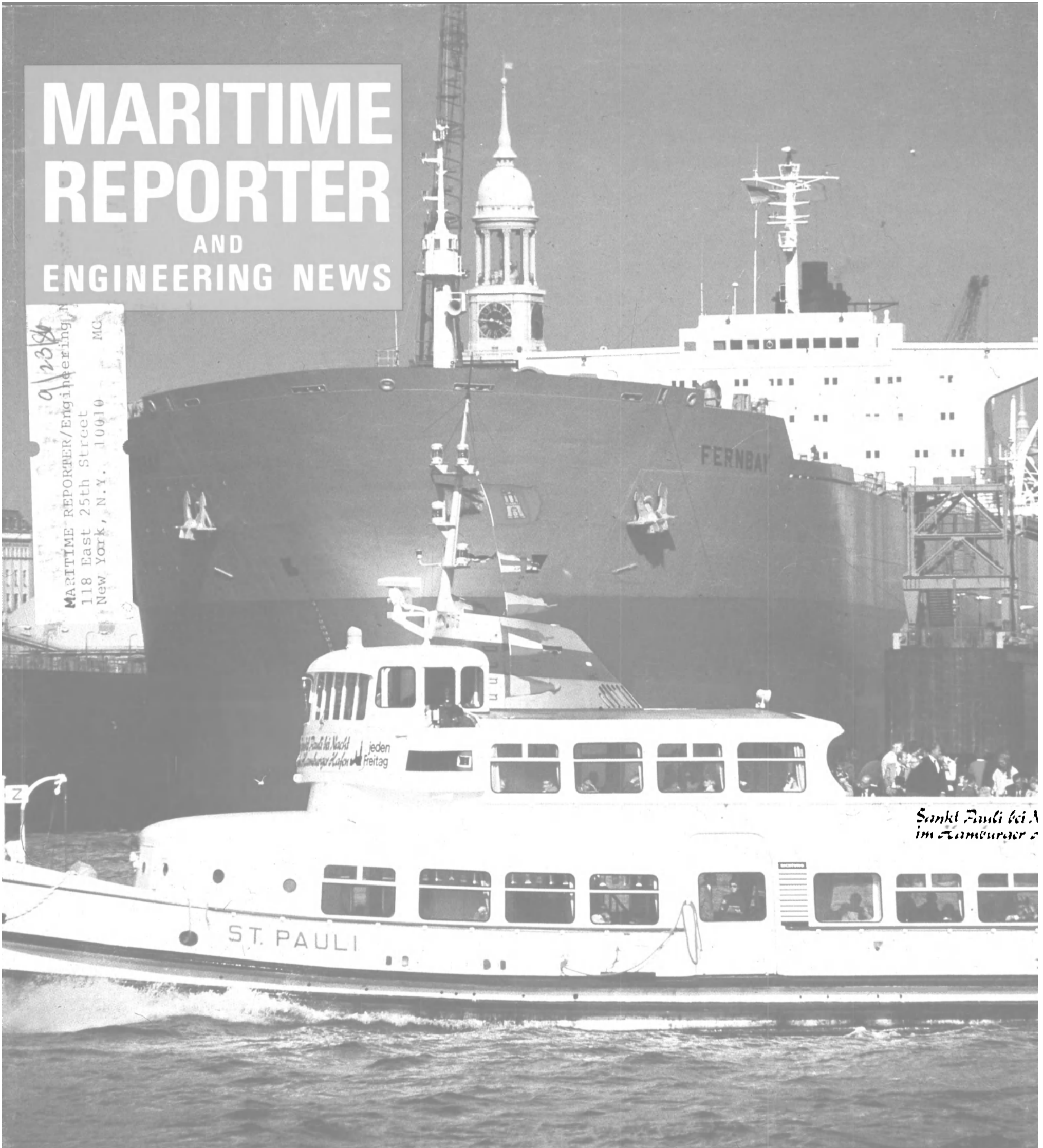


# MARITIME REPORTER AND ENGINEERING NEWS

9/23/86  
MARITIME REPORTER/Engineering  
118 East 25th Street  
New York, N.Y. 10010  
MC



Hamburg Harbor

**PREVIEWS: THE HAMBURG SHOW—ASNE FALL SYMPOSIUM**

**SPECIAL EDITION**

**NAVAL TECHNOLOGY & SHIPBUILDING**

**SEPTEMBER 1986 ISSUE**



# With COMSAT Maritime Services, every signal comes in loud and clear.

**Computer to computer. Packet data networks. News and weather reports. Electronic mail. Radio and television. Even credit card telephones and automatic banking services.**

Only COMSAT Maritime Services can give you shipboard communications that rivals anything available on shore. For both business and pleasure.

For business, any ship equipped with an INMARSAT ship earth station can send and receive electronic mail, connect to a packet data network (at speeds up to 9600 bps), and communicate with on shore computers. Telex and facsimile messages can be sent and received. Ships can receive up-to-the-minute weather information, including digital graphics.

For pleasure, COMSAT Maritime Services can connect on board telephones with almost any telephone in the world, send daily news reports, and provide live radio and television programming. Even electronic banking and credit card phone services are available.

With the communications package that only COMSAT Maritime Services can provide, it will be smoother sailing for you, your crew, and your passengers.

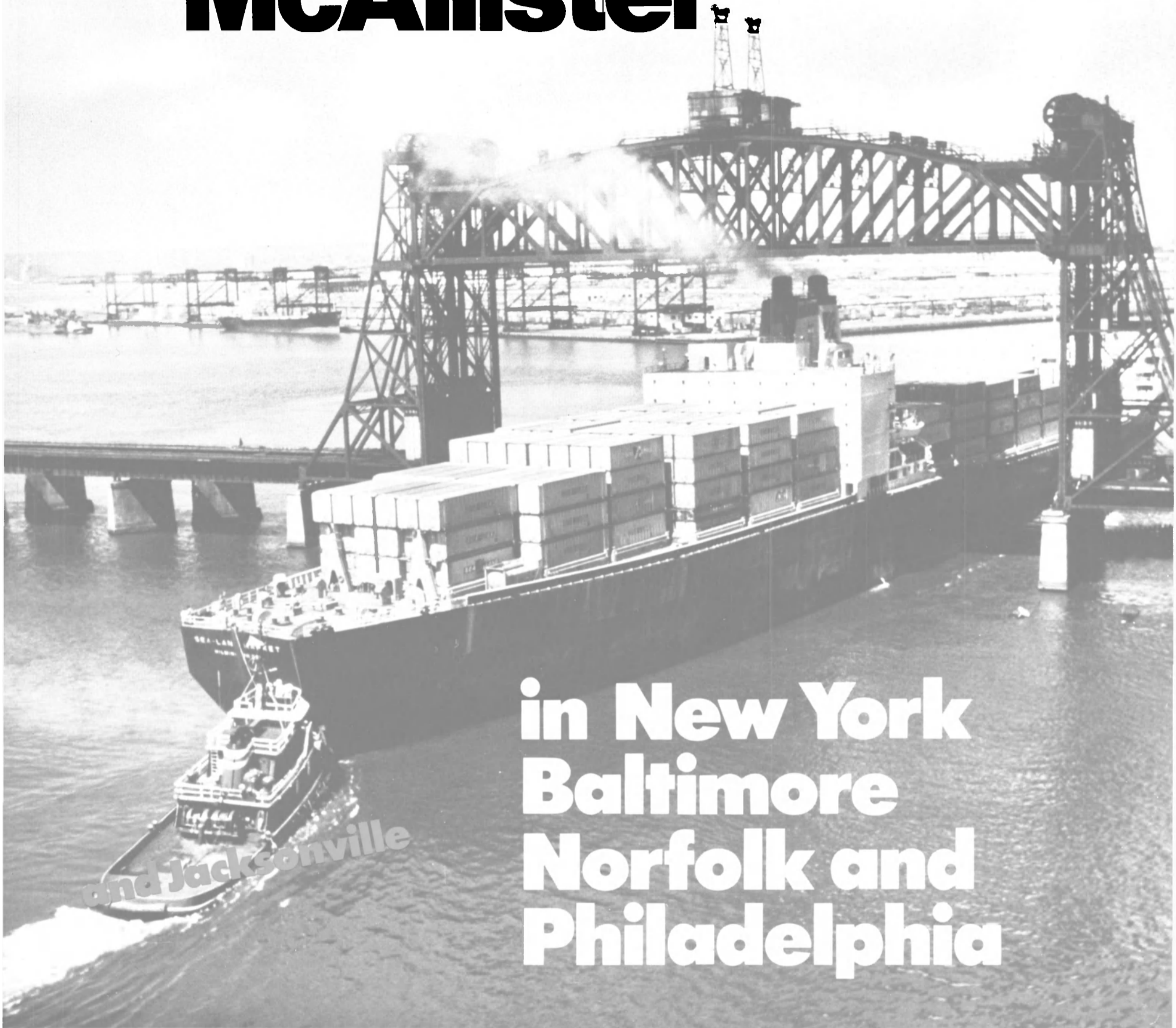
For more information call Bob Eichberg, Vice President, at 1-800-424-9152, or write:

 **COMSAT**  
Maritime Services

22250 COMSAT Drive Clarksburg, MD 20871.

Circle 14C on Reader Service Card

# The biggest call on McAllister



in New York  
Baltimore  
Norfolk and  
Philadelphia

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) 721-8888  
Jacksonville (904) 743-9226

**McAllister** 

## Repair worn, corroded parts in place



- minimal tear down
- fast turnaround
- good as new
- great cost savings

Why wait for replacement parts? Why remove in-line machinery? With CHESTERTON<sup>®</sup> METAL REPAIR SYSTEM you can repair damaged pump, valve or machine housings in-place, repair scored shafts, even repair metal under water!



REPAIRING WORN, HEAT EXCHANGER

REPAIRING WORN, CORRODED IMPELLER

There is a system of eight specialized CHESTERTON products to solve every metal repair problem at a small fraction of the cost of a standard replacement part. All products are easy to apply. Cure to a hard, well bonded substance that resists wear and chemical corrosion as well as, or better than, the original part. Seven can be machined, sawed, drilled or sanded to original part dimensions and tolerances.

Ask your local CHESTERTON Distributor for complete information on the low cost CHESTERTON METAL REPAIR SYSTEM or send for Bulletin 72920. A.W. CHESTERTON CO., Stoneham, MA 02180 USA. For immediate response, phone 617-438-7670.

# CHESTERTON<sup>®</sup>

## METAL REPAIR SYSTEM

© A.W. CHESTERTON CO., 1986. All Rights Reserved

C-3E MAR

Circle 112 on Reader Service Card

## ON THE COVER

The Hamburg Show  
—SMM '86—  
PAGE 16

A.S.N.E. Fall  
Symposium  
PAGE 50

Naval Technology  
And Shipbuilding  
PAGE 29

### Wärtsilä Becomes Major Shareholder In Wichmann —New Company Formed

An agreement for change of ownership has been reached between A/S Wichmann of Rubbestadneset, Norway, Wärtsilä Diesel, and a local group of shipowners and yards. The agreement has been approved by the Norwegian Industrial Fund and Department of Industry, and sanctioned by the Norwegian Cabinet.

The agreement calls for forming a new company—Wärtsilä-Wichmann Diesel A/S—that will take over the factory at Rubbestadneset. Oy Wärtsilä AB will be the major shareholder of the new company; the remaining share capital will be supplied by the local group of shipowners and yards, as well as by employees. The new company will have all rights to manufacture Wichmann products.

Wärtsilä-Wichmann will continue diesel engine production, and will conduct an effective after-sales activity including service, sales of spare parts, and ship repair work. Controllable-pitch propellers and remote control systems are to be sold worldwide as part of complete propulsion systems.

Marketing of the new WX28 heavy fuel engine will be concentrated in Norway, Iceland, and Faroe Island. This engine will also be sold to Norwegian shipowners building abroad, to Norwegian yards building for foreign owners, and to former Wichmann customers all over the world.

For additional information and free literature on the new company and its product lines,

Circle 92 on Reader Service Card

## MARITIME REPORTER and Engineering News

Editorial and Executive Offices  
118 East 25th Street, New York, NY 10010  
(212) 477-6700 • ITT Telex: 424768 MARINTI

Publishers: JOHN E. O'MALLEY  
CHARLES P. O'MALLEY  
Editorial Director: CHARLES P. O'MALLEY  
Editor: ROBERT WARE  
Senior Editor: THOMAS H. PHILLIPS  
Associate Editor: JOHN SNYDER  
Editorial Coordinator: LILIAN IRVINE  
International Editor: ROBIN F. BURNETT, MRINA, MNI, London, England  
Advertising Sales Director: JOHN C. O'MALLEY  
Regional Sales Managers: LISA WILLIAMS  
SHARI L. LINKER  
Production Manager: MARGE SULLIVAN  
Circulation Manager: M. SOTTILE

Advertising Circulation and Sales Offices  
118 East 25th Street, New York, NY 10010  
Telephone (212) 477-6700

### REPRESENTATIVES

Holland MR. TONY KENTER  
Kenter & Co.  
P.O. Box 130, 7470 AC Goor, Holland  
Telephone: 05470-5005  
Telex: 72028

Italy MR. VITTORIO F. NEGRONE  
Ediconsult Internazionale  
Piazza Fontane Marose, 3-16123 Genova, Italy  
Telephone: (010) 543.659-268.334-268.513  
Telex: 211197 EDINT I

Scandinavia MR. STEPHAN R. G. ORN  
AB Stephan R. G. Orn  
Box 184, S-271 00 Ystad, Sweden  
Telephone 0411-184 00  
Telex: 33335 Orn S

West Germany MR. WOLF O. STORCK  
Schiffahrtswerbung Karl-Otto Storck  
Stahlwiete 7, 2000 Hamburg 50,  
Federal Republic of Germany  
Telephone 040/850 0071

United Kingdom MR. MICHAEL J. DAMSELL  
Euromedia, Ltd.  
P.O. Box 122, Haywards Heath  
West Sussex RH16 1YF, England  
Telephone: 0444-416845

Korea MR. CHRIS MAENG  
IPR Int'l PR, INC.  
Yongsan  
P.O. Box 100  
Seoul, Korea  
Telephone: 273-7765  
Telex: MOCNDM K23231

Japan MR. TOSHIO EGUSA  
Publinetwork, Inc.  
Room No. 206 Pegasus Mansion  
21-7, Hakusan, Bunkyo-ku, Tokyo 112 Japan  
Telephone: 03 (812) 2406  
Telex: 02722469 EVERAD J

# MARITIME REPORTER

AND  
ENGINEERING NEWS

ISSN-0025-3448

No. 10

Volume 48

118 EAST 25th STREET  
NEW YORK, N.Y. 10010  
(212) 477-6700

Telex: MARINTI 424768

ESTABLISHED 1939

Maritime Reporter/Engineering News is published monthly, except twice a month in January, by Maritime Activity Reports, Inc. Mailed at Second Class Postage Rates at Waterbury, CT 06701 and additional mailing offices.

Postmaster send notification (Form 3579) regarding undeliverable magazines to Maritime Reporter/Engineering News, 118 East 25th Street, New York, NY 10010.

Member

**BPA**  
Business Publications  
Audit of Circulation, Inc.

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

# SIEMENS

## Now...convert at sea!

## UMS...for increased efficiency and lower operating costs.

In today's highly competitive shipping industry, remaining competitive is the key to remaining afloat. Ship owners everywhere face the problems of increasing their vessels' efficiency and lowering overall operating costs.

Siemens has the solution! Now you can meet the demands for more efficient operation, and stay competitive...by upgrading your ship with automated systems for unattended machinery operation (UMS) from Siemens.

Our cost-effective UMS systems will convert your steam or diesel-powered vessel to operate with the engine room unattended...safely, efficiently. You'll lower your overall operating costs as never before, through:

- Reduced crew requirements
- Highly efficient machinery operation
- Increased fuel efficiency



In fact, UMS systems from Siemens are so efficient, pay-back for your investment is often as short as two years!

When it comes to UMS upgrades, Siemens has the experience, the advanced technologies, and the skilled personnel to achieve a smooth, problem-free turnkey conversion...while you're at sea. Without a costly lay up.

Siemens 'does it all', including inspection, planning, obtaining

classification approval, equipment supply and installation...everything! And best of all, we do it while you're under way, with your vessel working for you.

For UMS...and a wide range of other electrical and electronic marine services, Siemens is the name to remember. With branch offices and service facilities in more than 100 ports in 53 countries, we're ready to serve your needs in the Siemens tradition of excellence.

For further information, contact Siemens Energy and Automation, Inc. 635 Montrose Avenue South Plainfield, NJ 07080 (201) 756-8660.

Siemens AG, Marine Department  
Lindenplatz 2, Siemenshaus  
2000 Hamburg 1  
Tel: (40) 282-2032  
Tx: 21558452

Circle 210 on Reader Service Card

## Siemens... supplier to the marine industry for over a century.

## Kabel And Jepsson Named Vice Presidents For Wärtsilä Diesel



Dan Kabel



Anders Jepsson

**Dan Kabel** has been appointed vice president of service and spare parts for Wärtsilä Diesel, Inc. in the U.S. Previously he served as superintendent engineer for a fleet of vessels operated by Seahawk Management, Inc. He is a graduate of the U.S. Merchant Marine Academy.

**Anders Jepsson** has been named vice president-administration. He was previously financial director for Ifo Sanitar in Bromolla, Sweden.

Wärtsilä Diesel, Inc. has offices in New York, New Orleans, Houston, and Miami, and is a subsidiary of Wärtsilä Diesel of Finland, a leading manufacturer of medium-speed diesel engines.

## Tideland Signal Offers Free 30-Page Brochure On Aids To Navigation For Ports And Harbors

Tideland Signal Corporation of Houston, Texas, manufacturer of high quality navigational aids and solar electric generators, has published a 30-page, full-color brochure on the company's products, and on the many projects around the world for which it has supplied equipment.

Tideland entered the international market in the early '70s and has since developed a sales and service network that includes three wholly owned overseas subsidiaries and representatives in more than 50 seaboard nations. The company has acquired 19 U.S. and 29 foreign patents for design innovations.

The colorfully illustrated publication discusses Tideland projects in such areas as Africa and the Middle East, Europe, Australasia, the Far East, Latin America, and Canada. This is followed by three domestic sections. The first covers Gulf Coast projects such as Galveston Bay Entrance Channels in Texas, and the LOOP (Louisiana Offshore Oil Port) Marine Project. The two other domestic sections deal with activities on the East Coast and in the Caribbean, and on the West Coast, including Alaska.

For a free copy of the 30-page, full-color brochure from Tideland Signal Corporation, Circle 77 on Reader Service Card

## Lucian Q. Moffitt Offers Paper On New Water Lubricated Rubber Bearing Materials/Applications

New engineering composite materials, nitrile rubber developments, performance efficiencies and application guidelines for water lubricated rubber bearings is the subject of a concise technical paper written by **John M. Foulk**, president of Lucian Q. Moffitt, Inc., a subsidiary of B.F. Goodrich. It was presented recently to the Gulf Section of The Society of Naval Architects and Marine Engineers.

Complete with illustrations, the paper describes the evolution of materials from the original lignum vitae materials to ultra high molecular weight plastics for staves and engineering composite shell materials for full molded water lubricated bearing designs. Traditional brass shell materials are also discussed. The paper covers lubrication, shaft care, shaft bearing clearances, load deflection characteristics and installation procedures.

The paper is available without cost from Lucian Q. Moffitt, Inc., manufacturer and marketer of Cutless® Commander®, Romor® and Standard Cutless water lubricated rubber bearings. Simply request a copy of "Water Lubricated Rubber Bearings: A Brief Overview of History, Application Guidelines and Recent Advancements" on your company letterhead, to Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309, or

Circle 78 on Reader Service Card

## New Hull Cleaning System Brochure Offered By VEB Kombinat Schiffbau



VEB Kombinat Schiffbau hull-cleaning system in operation.

The hydraulically operated hull cleaning system manufactured by VEB Kombinat Schiffbau of the German Democratic Republic permits shell plating to be cleaned, derusted, painted

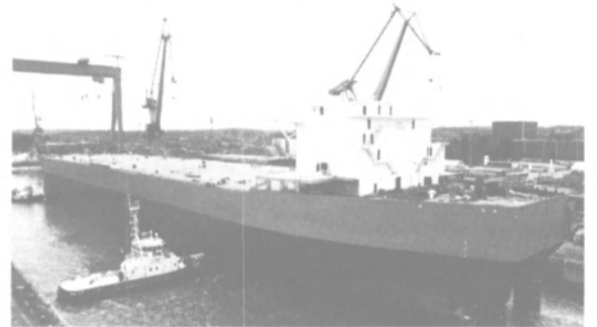
and repaired while the ship is in dock. The advantages to the shipyard are: a reduction in manpower; vessel spends less time in dock; existing dock cranes need not be used for cleaning or painting; eliminates scaffolding and bottom of the dock remains free from obstructions; and healthier environment when derusting due to application of closed circuit wire shot blasting system.

The system enables the hull to be cleaned down to the bare metal, improving the durability of the paintwork and keeping the drydock time to a minimum. It offers the vessel owner substantial fuel savings and minimum downtime.

For a free copy of the brochure completely describing the new system,

Circle 75 on Reader Service Card

## Hull Built By Wärtsilä-Turku Will Be Outfitted By Moss Yard



Shuttle tanker of 127,000 dwt is cooperative venture of Wärtsilä's Turku yard in Finland, which built the hull and installed Wärtsilä/M.A.N.-B&W main engines, and Fredrikstad yard of Moss in Norway, which will complete ship with accommodations and outfitting.

The biggest hull ever built by Wärtsilä was delivered recently to its purchaser, the Norwegian Moss Fredrikstad Verft. This project is a unique example of how shipyards in two different countries can carry out a cooperative building venture. The Turku yard constructed the hull and installed the main engines; the Moss yard will complete the outfitting and accommodations. The hull left the Finnish yard for delivery to Norway accompanied by five tugboats.

When completed this 127,000-dwt shuttle tanker will carry crude oil from North Sea fields to shoreside terminals. The ship will have an overall length of 843.2 feet, beam of 150.9 feet, and draft of 52.5 feet. Main propulsion will be provided by two Wärtsilä/M.A.N.-B&W diesels, each with an output of 9,760 bhp at 95 rpm.

For additional information on the Wärtsilä shipyard in Turku and Helsinki, Finland,

Circle 79 on Reader Service Card

For further information on the Moss yards in Fredrikstad and Rosenberg, Norway,

Circle 80 on Reader Service Card

## EQUIPMENT • PARTS • SERVICE • REPAIR



### EE CENTRIFUGE • SEPARATOR • PURIFIER PARTS

OEM QUALITY +

LARGE SAVINGS OVER OEM

STOCKING FOR ALFA-LAVAL/DELAVAL PURIFIERS

MODELS—MAB—MAPX—MOPX—WHPX—FOPX

AVAILABLE—MINOR—INTERMEDIATE—MAJOR

EE—CENTRI-KITS

Contact: Tom Junod

**MAIN OFFICE**  
757 Murry Street  
Indianapolis, IN 46227  
(317) 783-5496

**WEST COAST OFFICE**  
666 Baker Street #265  
Costa Mesa, CA 92626  
(714) 540-3200

**TOLL FREE CALL 1-800-952-6859**  
**TELEX: 27-6125**



**Equipment Engineering**

Circle 170 on Reader Service Card

## MARINE TV ANTENNAS

AND DISTRIBUTION SYSTEMS

- CABIN OUTLETS
- FREE ENGINEERING

MK20CA

"OMNI-DIRECTIONAL"

**Naval ELECTRONICS, INC.**

5417 JETVIEW CIRCLE  
TAMPA, FLORIDA 33614  
(813) 885-6091 TELEX: 289-237 (NAVL UR)

Circle 193 on Reader Service Card

Maritime Reporter/Engineering News



Artist's rendering shows dredge Chicago in clamshell mode with barge alongside.

## World's Largest Clamshell/Dipper Dredge To Be Delivered This Year To Great Lakes International

The dredge Chicago, said to be the world's largest and most powerful combination clamshell/dipper dredge, is scheduled for completion and assignment by the end of this year, according to Great Lakes International, Inc., the vessel's owner. **William L. Colnon**, president of GLI, announced that when the Chicago is completed, it will provide unequalled capabilities and versatility for the dredging industry in both the clamshell and dipper modes.

In order to effectively utilize the unprecedented production capacity of the new dredge, two large split-hull, hopper dump barges have been designed and are also presently under construction. This bold advancement in the bucket dredge field was based on a careful analysis

### DREDGE 'CHICAGO' Major Suppliers

Main engine	EMD-GM
Auxiliary generators	Caterpillar
Hydraulics	Heath Engineering
Electrical instrumentation	GE
Dredge computer	Dredge Technology
Gyrocompass	Sperry
Fuel separator	Alfa-Laval
Coolingwater/bilge/fire pumps	Goulds
Heat exchangers	Alfa Laval
Heating/air conditioning	Thermacon
Firefighting system	Kidde
Watermaker	Alfa-Laval
Sewage treatment	Microphor
Crane	Harnischfeger
Service Crane	Unit Crane
Spud winches	Falk
Deck winches	Mobile Pulley & Machine Works
Quarters	International Building Systems
Paint	International Paint

of future dredging requirements, according to Mr. Colnon. The Chicago has been designed specifically for work in the ports of the U.S., including the deepening of proposed deep-water ports, as well as in the ports of the rest of the world. The investment of \$30 million in the new dredge and the two barges is the largest single appropriation in the company's 100-year history.

The first design criterion for the Chicago was to double the capability of any clamshell or dipper dredge in existence. The P & H model 5700 electric excavator was selected as the most efficient digging machine available for that purpose. This revolving unit, weighing nearly 100 tons, is under construction at Harnischfeger Corporation in Milwaukee. The dredge will have a 50-cubic-yard clamshell bucket, whereas the largest clamshell currently in operation uses only a 26-cubic-yard bucket.

The Chicago will develop a dipper hoist pull of 480,000 pounds at a line speed of 240 feet per minute, about twice that of the next largest dipper currently in operation anywhere in the world. In addition, the dredge has been designed to operate with a 27-cubic-foot dipper bucket, compared with the 14-cubic-yard dipper that is the biggest presently in use.

The hull of the Chicago, being built by Southern Shipbuilding Corporation in Slidell, La., will be more than twice the size, by volume, of today's biggest clamshell and dipper dredges. The cross-sectional area of

the new vessel's spuds (a measure of the ability to work in rough seas) will be 2½ times that of similar existing dredges. Its total installed output of 8,650 horsepower is almost four times greater than that of today's largest dipper, and seven times more than that available in clamshell dredges at present.

The two new barges are being constructed by Bay Shipbuilding Corporation in Sturgeon Bay, Wisc. With a 6,000-cubic-yard capacity, they are 1½ times the size of the next largest barge of this type in use, and have an overall length of 277 feet and beam of 63.5 feet. They will be towed by 5,600-bhp tugs of twin propeller, Kort nozzle design.

Working in either the clamshell or the dipper mode, the Chicago will provide a continuous operation, dredging the material and disposing of it without interruption, even if the disposal area is far removed from the dredge site. The exceptional dipper power also enables the dredge to excavate extremely difficult material that might have otherwise required blasting.

For additional information including detailed literature on the services offered by Great Lakes International,

Circle 32 on Reader Service Card

For copies of free color literature being offered by Bay Shipbuilding on their facilities and capabilities,

Circle 33 on Reader Service Card

<sup>TM</sup>  
**INFRAPHONE**

— keeps your boiler clean

Yes please,  
send more information!

Mail this coupon to

**INFRASONIK AB**

S-612 20 Finspong, Sweden  
MR

Name .....

Company .....

Dept .....

Address .....

City .....

Country .....

or use the reader enquiry service.

Circle 107 on Reader Service Card

## CDI Marine Names Eason VP, Operations-West

CDI Marine Company, naval architects and marine engineers, have announced expanding operations have resulted in the promotion of **Don Eason** to vice president, Operations-West. Mr. Eason will add to his current assignment as program manager for the Puget Sound Naval Shipyard, the responsibilities

for the operational management function of the Bremerton, Seattle, Yokosuka, and Boston offices.

Mr. Eason has extensive knowledge in the design and planning field, and has held progressively increasing levels of responsibility, including office manager for the Groton, Charleston, and Jacksonville offices.

Mr. Eason is an active member of the American Society of Naval Engineers.

# WILL A FAST OVERHAUL SUPPORT YOUR MISSION?

Contact Transamerica Delaval, Pyramid Pump Division, for quality, cost-effective overhauls of your turbine-driven FOS and LOS pumps.

Pyramid Pump Division (formerly IMO Pump Division) offers complete overhaul services and OEM parts for FOS and LOS turbine-driven pumps. No one but Pyramid Pump Division can offer these same outstanding repair services:

- **Full-Load Testing** assures performance to specifications *prior* to sea trial.
- **New Equipment Warranty** for all materials and workmanship.
- **Factory Trained Personnel**, including engineers, designers and metallurgists, know the equipment and all part functions.
- **Expert Inspection** is performed on each individual part, determining whether they should be reworked, reused or replaced. When new components are needed, they are precision manufactured to Pyramid Pump Division specifications.
- **Qualified Field Support** is available for inspection evaluation, removal and reinstallation assistance, shipboard test support, training and troubleshooting.
- **Quality Assurance Personnel** inspect and verify all details of the overhaul process.

Have your FOS and LOS pumps overhauled by the people who know them best, so you can deploy with peace of mind.

Details for specific applications available upon request.



**Transamerica Delaval**

PYRAMID PUMP DIVISION

P.O. Box 5020  
Monroe, NC 28110-0527  
(704) 289-6511

Circle 177 on Reader Service Card



Artist's rendering of 1,900-passenger cruise ship that Wärtsilä Turku Shipyard will build for Kloster Cruises A/S. New vessel will operate in Caribbean area as part of Norwegian Caribbean Lines fleet. Ship is scheduled for May '88 delivery.

## Wärtsilä Wins \$122-Million Contract To Build Big Cruise Ship For Kloster

Wartsila has been awarded a \$122-million contract for construction of a 1,900 passenger cruise liner for the Norwegian shipowner Kloster Cruise A/S. According to the contract, signed recently in Oslo, the Finnish builder's Turku Shipyard will deliver the 40,000-gt vessel in the spring of 1988. The contract includes an option for a second similar vessel to be placed with Wartsila. The design of the vessel was a cooperative venture between Kloster Cruise and both the Turku and Helsinki Shipyards of the Wartsila Shipbuilding Division.

The new ship will have an overall length of 695.5 feet, beam of 93.2

feet, and draft of 22.3 feet. Main propulsion will be by four Wartsila/Sulzer 8 ZAL 40S medium-speed diesels with a total output of 28,720 bhp. Electrical power will be provided by four 2,900-kw generators driven by Wartsila Vasa 8 R 32D engines.

The new vessels will join the Norwegian Caribbean Lines fleet which already has five ships, including the Norway (ex-France).

For free detailed literature containing full information on the services and facilities offered by Wartsila,

Circle 27 on Reader Service Card

## Olsen Tanker Fleet Continues To Expand

In a continued expansion of its tankship activities, Oslo-based Fred. Olsen & Co. recently acquired the tanker Al-Oyour (ex-Athene) on long-term charter from foreign interests, who had purchased the vessel recently for about \$8.3 million.

Built by Kockums in Malmo in 1974, the 260,000-dwt tanker has been renamed Nock Dolian.

Olsen also took control of two other tankers recently, the Wangli and the Wangskog, each of 128,400 dwt. The addition of the three vessels, which will sail under the Liberian flag, has doubled the Norwegian company's tanker capacity.

## Wilson Walton Introduces Improved Version Of Aquamatic Impressed Current Cathodic Protection System

An improved version of the widely used Aquamatic impressed current cathodic protection system, incorporating a larger, 225-amp anode and a more compact power unit, has been introduced by Wilson Walton International.

The first installation of the new system will be on the new Hull 321, a 108,000-ton tanker currently under construction at China Shipbuilding Corporation for CPC of Taiwan.

Advantages of the larger 225-amp anode are significantly reduced installation costs, since only two are required instead of four 150-amp anodes; secondly, being manufactured from platinized titanium, a considerable savings in weight is achieved. Also the cost per amp supplied is reduced by 12 percent using the 225-amp anodes. The Aquamat-

ic 3 power unit also offers advantages over the previous unit, being lighter in weight, more compact and cheaper to install.

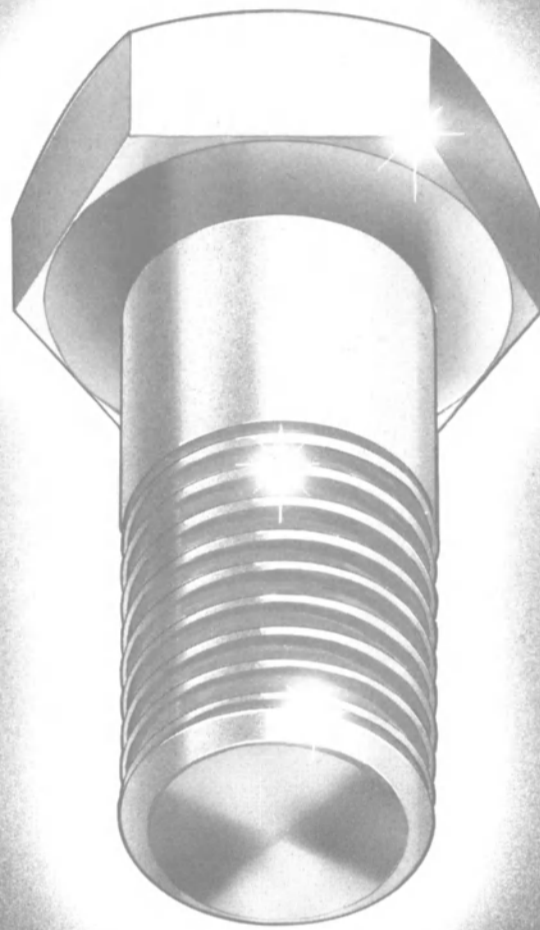
Developed in the U.K. under an exclusive agreement with Westinghouse, Aquamatic 3 now features thyristor control and LED bargraphs for output display of the system parameters.

An important advantage of the unit's light weight and compact size is that Aquamatic ICCP systems can now be retrofitted to existing vessels much more easily and economically than before, making the Aquamatic 3 more competitive with traditional sacrificial anode systems.

For free literature containing full information,

Circle 31 on Reader Service Card





# Meet Your Maker...Buy Direct!

Nevada Bolt & Mfg. Co. has made quality a number one priority and has recently accelerated its programs to encompass some of the most stringent standards in quality assurance. We like knowing that our parts are superior and our customers are satisfied with the quality they receive from Nevada Bolt & Mfg. Co. And with our recent MIL I 45208 certification we feel that our product carries an additional "seal of approval."

non-standard fasteners in high temperature and corrosion resistant metals. With 20 years of experience in the fastener industry we have become one of the nation's foremost producers of domestically manufactured fastener "specials." We are capable of producing hex heads, nuts, sockets, slots, carriage bolts, T-head bolts, square heads, penta heads, special studs and many more styles from over 100 grades of stainless steel and exotic metals. We will continue to strive for new and better ways to achieve high quality, good service and reliability our customers depend on.

Nevada Bolt & Mfg. Co. specializes in producing standard and

- COMPLETE TRACEABILITY  
MIL I 45208

- CERTIFICATIONS (On Request)  
ANSI QQN-281 ASME  
ASTM QQN-286 1S0

- NICKEL ALLOYS  
MONEL\*  
INCONEL\*  
INCOLOY\*

- HASTELLOY\*\*  
B-2  
G-3  
C-276  
X

STAINLESS STEEL

302	316L
303	317
304	317L
304B	321
304L	330
309	347
310	410
316	416
316B	430

- MIL SPECIFICATIONS  
B-857, 1222-F, 1222-G
- FED SPECIFICATIONS  
FF-S-85, FF-S-86, FF-S-92

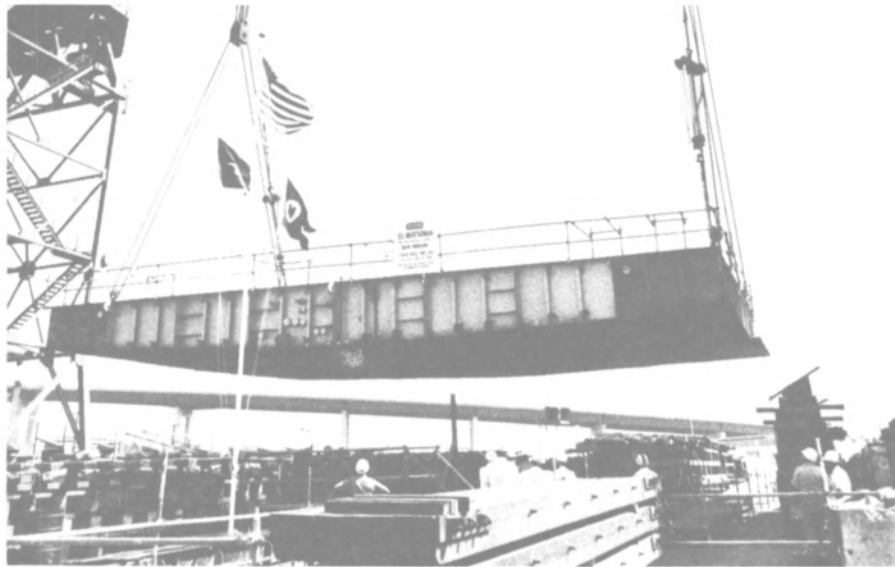
**NB Nevada Bolt & Manufacturing Co. Inc.**

TOLL FREE 1 (800) 742-0044 • FAX NO (702) 739-9043 • PHONE (702) 798-0044  
3650-M WEST RUSSELL RD. • LAS VEGAS, NEVADA 89118-2488

Circle 252 on Reader Service Card

\*Registered trademark of INTERNATIONAL NICKEL CO.

\*\*Registered trademark of STELLITE DIVISION, CABOT CORP.



Keel unit weighing 236 tons is placed on ways at Todd Pacific yard in San Pedro. This is first of 59 units that will comprise new 351½-foot midbody section for Matson Navigation's Matsonia that will triple her cargo capacity.

## Keel Laid At Todd San Pedro Yard For Matsonia's New Midbody Section

Conversion of Matson Navigation Company's RO/RO trailership Matsonia to a combination RO/RO and LO/LO container carrier is progressing on schedule as the 236-ton keel unit of the ship's new midbody section was placed on the building ways at Todd Pacific Shipyard in San Pedro, Calif. This is the first of 59 units that will comprise a

351½-foot section that will replace a 291½-foot midsection that will be removed from the vessel, increasing her present length of 700 feet to 760 feet. Launching of the new midbody section is scheduled for January 1987, with the ship redelivered to Matson in May to join the company's West Coast-Hawaii fleet, with cargo capacity tripled to accommo-

date more than 1,200 containers, plus trailers, automobiles, and bulk molasses.

During the period of midbody construction, major modifications will be occurring aboard the ship as she is afloat at the shipyard. Engine room alterations will be made to improve fuel efficiency, and a four-tier auto garage will be installed on the after deck.

After the midbody is launched, the Matsonia will be raised out of the water by Todd's Synchrolift system and hauled on rail-mounted cradles to the shoreside work platform where cutting of the hull and inserting of the new midbody will take place. The Todd rail system is ideal for this type of work because of its ability to maneuver large vessel sections laterally in and out of position.

The Matsonia will be ready for relaunching in March next year, and after two months of reactivation op-



Keel section of new midbody is certified by Mrs. **Marge Haskell**, wife of Matson senior vice president (engineering and marine operations) **Arthur J. Haskell**. At left is **Len Thorell**, vice president and general manager of Todd's San Pedro yard.

erations and sea trials will be ready to resume service.

For further information on Todd Pacific's San Pedro yard,

Circle 25 on Reader Service Card


## Dravo Mechling Charters Former National Marine Service Tank Barge Fleet

Dravo Mechling Corporation, New Orleans-based subsidiary of Dravo Corporation of Pittsburgh, became the nation's biggest inland tank barge operator when it chartered 141 units formerly operated by National Marine Service of St. Louis.

National Marine's parent company, NICOR Inc., recently sold the barges and three towboats to a private investor group. Dravo then acquired the vessels on short-term charters. The move more than doubles the company's tank barge fleet, which now totals about 240 units. Dravo now operates about 700 barges of all types, and more than 40 towboats.

**FERNSTRUM**  
**GRIDCOOLER**

When lives depend on your boat's reliability...



Don't take a chance on your cooling system. Crockett & McConnell use Fernstrum GRIDCOOLERS to keep their search and rescue crafts always ready.

Fernstrum GRIDCOOLERS are completely assembled and factory tested to assure dependable service. Fernstrum GRIDCOOLERS are available in copper-nickel 90/10 and 5000 series aluminum.

TO CONTACT US:  
R. W. FERNSTRUM & COMPANY  
MENOMINEE, MICHIGAN, U.S.A. 49858  
Phone: (906) 863-5553 • Telex: 26-3493  
Answer Back: FERNSTRUM MNOM

Circle 165 on Reader Service Card

**PUT US TO THE TEST**  
**OCEAN FLEETS SERVICES**

The cost of fuel and lube oil is your largest fleet operating expense. And contamination can add staggering costs in engine damage and downtime. To keep costs as low as possible, turn to Ocean Fleets Services. Our 125 years of experience in ship maintenance can help you with:

- **On-Shore Fuel Testing.** Call our Telex number from any major bunkering port, and we'll pick up a fuel sample at your ship, analyze it in our lab within 24 hours after receipt and get the results to you immediately.
- **On-Shore Lube Oil Testing.** Satisfy survey requirements of classification societies. Eliminates time-consuming, costly tear-downs to determine conditions of equipment.

Ocean Fleets Services can also help you with fuel selection, on-board trouble shooting, personnel training and fuel systems design and modification. Call or write.

**OCEAN FLEETS SERVICES**  
P.O. Box 247, Thorofare, NJ 08086  
Telephone: 1-609-848-2913

Circle 333 on Reader Service Card

WINCHES  
CRANES



HATCH  
COVERS

**DEL GAVIO**

**MARINE HYDRAULICS, INC.**

SERVICE • CONSULTING • PARTS

**Complete Repairs**  
On All Types of Electro Hydraulic  
Steering Systems

**Hydraulic Pump Testing,  
Rebuilding For Certification**

**24 Hour Service, Worldwide**  
207 West Central Ave., Maywood, N.J. 07607  
Telephone: (201) 843-4700  
Telex: 132610 DELMARINE

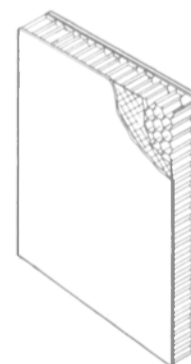
Circle 155 on Reader Service Card

## JOINER BULKHEADS

THE NAVY'S LIGHTEST AND STRONGEST HONEYCOMB BULKHEAD PANELS -

(Meets U.S. Navy Specs)

- Corrosion Resistant
- Lightweight
- High Strength/Weight Ratio
- Decorative



- Aluminum
- Steel
- Stainless Steel
- GRP/Nomex®

## TYPICAL APPLICATIONS:

- M.J. Bulkheads
- Berthing Partitions
- Shower Enclosures
- Waterclosets
- Work Stations
- False Decks

AVAILABLE WITH ALUM., CRES & GRP ERECTION MEMBERS



**ADVANCED STRUCTURES CORP.**  
235 WEST INDUSTRY COURT  
DEER PARK, NEW YORK 11729  
516-667-5000

NOMEX® ARAMID IS A TRADEMARK OF DUPONT

Circle 246 on Reader Service Card

Maritime Reporter/Engineering News

## Pennsylvania Shipbuilding Contracts With Siemens For PTO Generators

Siemens has been awarded a contract by Pennsylvania Shipbuilding Company of Chester, Pa., to supply the PTO generating systems for three Navy oilers, the T-AO 191, 192 and 194.

Each shipset consists of two 2,500-kw constant frequency PTO generators being driven off the main reduction gear. The function of each system can be reversed, allowing the PTO generators to serve as "emergency take-home propulsion."

The contract was placed with the Siemens Marine Department, South Plainfield, N.J.

For more information, contact **Allan Daneville**, Siemens Energy & Automation, Inc.; Power Engineering Marketing Division, 635 Montrose Avenue, South Plainfield, N.J. 07080, phone (201) 756-8660. Telex 844424, or

Circle 43 on Reader Service Card

## APL Gets MarAd Approval To Order Six Combination Carriers In Foreign Yard

The Maritime Administration and its Maritime Subsidy Board has granted permission to American President Lines of Oakland, Calif., to exercise the foreign shipbuilding rights it acquired in 1985. This will allow APL to contract with a shipyard (or yards) abroad for the construction of six bulk carrier/container-ships for operation on its trans-Pacific trade routes.

The new vessels will be considered replacements for six container-ships in APL's current fleet, and will be eligible for wages-only operating differential subsidy for a crew of 21 per ship. The ODS will not cover other items such as maintenance and insurance, nor will it be paid when "premium-rated" government preference cargoes are carried.

## St. Philip Towing Announces Sale Of Oceangoing Tug And Barge Fleet



St. Philip Towing's tug Tampa is one of the most powerful shipdocking-assist tugs operating in a U.S. port.

**William H. Young**, president of St. Philip Towing and Transportation Co., headquartered in Tampa, Fla., has announced the sale of its oceangoing tug and barge fleet to TECO Transport & Trade Corporation.

"The sale of our oceangoing tug and barge fleet will enable us to

aggressively pursue expansion and diversification," said Mr. Young. "We have been seeking to move ahead and, with the capital generated by the sale of our oceangoing equipment, we can focus our efforts on development and implementation of growth plans in the harbor operations segment of our business."

St. Philip recently introduced the tug Tampa, one of the most power-

ful shipdocking-assist tugs currently operating in a U.S. port. A second vessel similar to the tug Tampa is planned. The company also recently introduced the tug Thomas into the Mobile harbor operation. This craft is equipped with the latest technology and brings to the Mobile ship-assist business the company's first tractor tug. Mr. Young stated that expansion plans could include other ports.

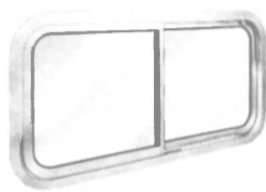
St. Philip Towing maintains a fleet of 24 vessels, following the sale of the oceangoing division, and operates a substantial harbor operations system in the Port of Tampa, Port Manatee, and St. Peterburg in Florida and Port of Mobile in Alabama.

For more information on the services offered by St. Philip Towing,

Circle 40 on Reader Service Card

## PROVED ENGINEERING AND DEPENDABILITY

STAND BEHIND THE WORLD'S FINEST SHIPBOARD WINDOWS, WINDSHIELD WIPERS AND DOORS BY... SINGER'S KEARFOTT DIVISION... NATURALLY.



SLIDING WINDOW



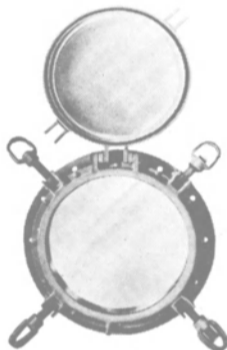
CRANK-OPERATED WINDOW



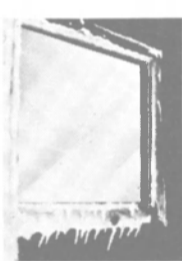
WINDOW WIPER AND FIXED WINDOW



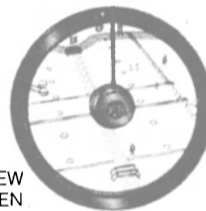
WEATHERTIGHT DOOR



HINGED PORTLIGHT



DE-ICING, HEATED WINDOW



CLEAR VIEW SCREEN

Kearfott products are quality constructed to meet requirements of A.B.S., U.S.C.G. and Navy standards.

Kearfott windows and doors can be manufactured in various sizes, shapes and materials.

Catalog showing complete line of marine products furnished upon request.

# SINGER

THE SINGER COMPANY  
KEARFOTT DIVISION  
550 S. Fulton Ave., Mt. Vernon, N.Y. 10550  
914-664-6033 • Telex 133440.

Circle 205 on Reader Service Card

## LESS MAINTENANCE. SAVES ENERGY.

### Bailey and Dunham-Bush for air conditioning.

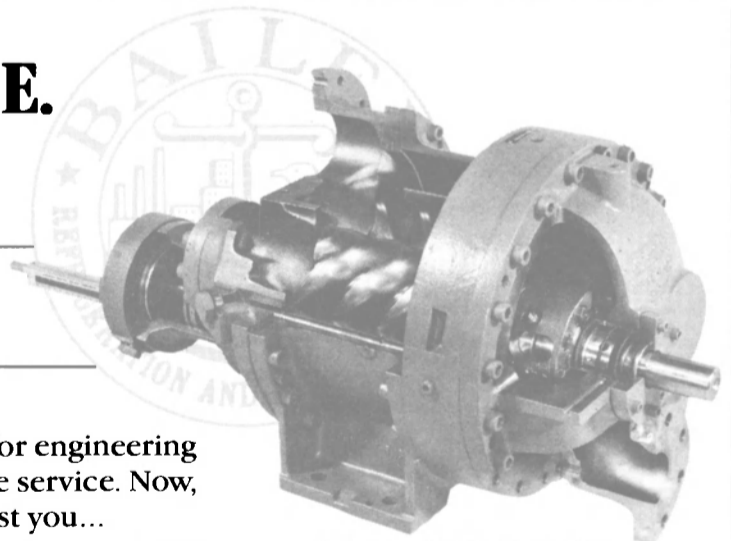
For over 35 years, you've come to Bailey for engineering expertise, fine equipment and dependable service. Now, we have something new that might interest you...

#### THE DUNHAM-BUSH ROTARY SCREW COMPRESSOR

The Dunham-Bush Rotary Screw Compressor has only seven moving parts, therefore it requires **less maintenance**. 50,000 hours between recommended inspections. Modulation capacity of 10% to full load results in significant **energy savings**.

#### TAILORED TO YOUR NEEDS

Bailey stocks a full line of rotary screw and reciprocating equipment. If you require, our engineers will design and install equipment or systems tailored to your specific needs.



Call or write Bailey today for quotes, advice, technical literature... anything you need in HVAC & R.

# BAILEY

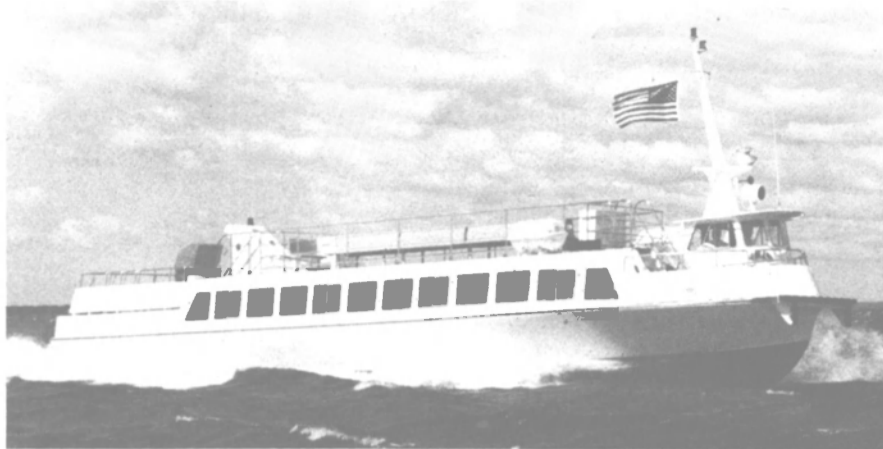
REFRIGERATION CO., INC.

2323 Randolph Ave.  
Avenel, N.J. 07001 U.S.A.  
Telephone: (201) 382-1225  
Telex: 4754293

Circle 106 on Reader Service Card

## Blount Awarded \$1-Million Contract To Build Ferry For Casco Bay Lines

Blount Marine Corporation of Warren, R.I., recently received an order from Casco Bay Lines in Maine for the construction of a 122-foot ferryboat at a price of \$1,084,500. The new 10-car, 350-passenger vessel will replace the ferry Rebel, which CBL plans to sell. Delivery of the new boat is scheduled for early summer 1987.



High-speed ferry Port Imperial will carry commuters between New Jersey and New York.

## Blount Delivers Commuter Ferry For High-Speed Hudson Crossings

Blount Marine Corporation of Warren, R.I., recently completed the 149-passenger, 77-foot, high-speed commuter ferry Port Imperial, said to be the first high-speed commuter ferry built for a Manhattan area run. Designed and built from Blount's patented concept of hull construction, it was delivered to Remus Realty of Port Imperial, N.J., for use as a commuter ferry between West 38th Street in Manhattan and Arcorp Properties, a 350-acre development site across the Hudson River in Weehawken, N.J. On earlier trial runs, the Hud-

son crossing was made in less than three minutes.

The Port Imperial is a Hitech type fast commuter ferry designed for quick, reliable transportation between terminals to provide a more convenient and comfortable passage for commuters. Certified by the U.S. Coast Guard to carry 149 seated passengers, the aluminum/foam/fiberglass composite construction of this high-speed craft renders it virtually unsinkable. In addition, as all components are extremely durable, the hull needs minimum maintenance. The minimum wake pro-

duced by the vessel is of significant operational importance.

Combined with the floating Blount Boat-Bus/Passenger Terminal, the Port Imperial will be capable of moving 750-1,000 people per hour crossing the Hudson on its regular route.

Blount's Hitech line includes three basic models:

- The 50-foot Water Taxi capable of speeds of up to 30 mph, certified by the Coast Guard for 70 passengers;
- the 77-foot Boat Bus, available with USCG certificate for Lakes, Bays, and Sounds to carry 149 passengers in a sound-proof cabin;
- the People Mover for 300-400 passengers, an all-aluminum commuter boat with various applications including high-speed commuter shuttle, cruise ship support launch, beach landing excursion craft, and standard ferry use.

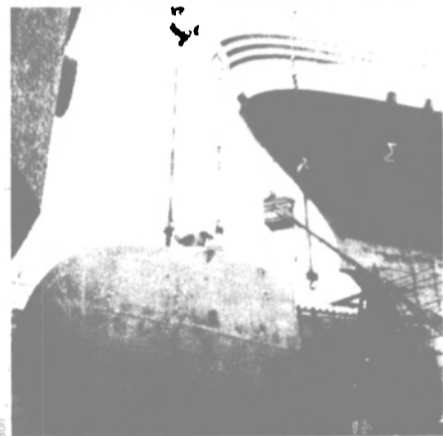
These boats are built entirely of durable and low-maintenance materials. Their tough, easily maintained fiberglass hulls have been tested to withstand loads of more than 10 tons per square foot of surface. The hull has proven capable of breaking six inches of hard ice. According to the builder, the per-passenger seat cost is about the same as that of a standard charter bus, and the operating costs are low.

For further information and full-color literature about the Hitech boat line and other Blount designs,

Circle 20 on Reader Service Card

IRI GROUP

## FINCANTIERI IS SHIPREPAIRS & CONVERSIONS



20 graving docks for ships up to 400,000 tdw, 8 floating docks for ships up to 160,000 tdw, 13 km of repair berths and the frontage of the repair yards around the Italian coastline: the resources of Fincantieri's Shiprepairing Division are conveniently situated along the main and busiest Mediterranean shipping routes.

### YARDS FOR SHIP REPAIR:

- A.T.S.M. - TRIESTE YARD  
Tel. (0) 40 7391 - Tlx 460122 FINCAT I
- C.N.O.M.V. - VENEZIA YARD  
Tel. (0) 41 798511 - Tlx 410255 FINCV E I
- TARANTO YARD  
Tel. (0) 99 407134 - Tlx 860020 FINCTA I
- PALERMO YARD - Tel. (0) 91 546488-545288  
Tlx 720674, 910041 FINCPA I
- S.E.B.M. - NAPOLI YARD  
Tel. (0) 81 7858111 - Tlx 710040 FINCNA I
- O.A.R.N. - GENOVA YARD  
Tel. (0) 10 283801 - Tlx 270090 FINCOR I
- M.G.N. WORKS  
Tel. (0) 10 283811 - Tlx 270370 FINCMG I
- LIVORNO YARD  
Tel. (0) 586 34121 - Tlx 500071 FINCLI I

## FINCANTIERI Cantieri Navali Italiani S.p.A.

SHIPREPAIRING DIVISION  
Via Cipro, 11 Genova/Italy Tel. (0) 10 59951  
Tlx 270102 FINCGE I

Circle 275 on Reader Service Card

## Carey Appointed President Of United States Lines

James J. Carey II has been elected president and chief operating officer of United States Lines. He succeeds Malcom P. McLean Jr., son of USL's principal owner. According to a company announcement, Mr. McLean will now devote most of his time to McLean Industries, the line's parent organization, but will remain involved with the shipping company.

Prior to joining USL in 1971, Mr. Carey was vice president-ports and terminals for Seatrain Lines. Before that he served some five years in various executive posts at Sea-Land Service. His most recent position at USL was executive vice president-Atlantic service.

Mr. McLean joined USL in 1978, and was executive vice president before being elected president and COO in 1985.

## Buky Appointed Vice President-Sales At ACBL

James W. Buky has been promoted to vice president of sales for American Commercial Barge Lines, Inc. (ACBL) of Jeffersonville, Ind. A 19-year veteran of the barge and towing company, he joined ACBL as a dispatcher and became district director in the distribution services department in 1969. In his new position, he will be responsible for ACBL's sales in dry bulk commodities and also for equipment allocation.

## Pier 80 In San Francisco Scheduled For \$15-Million Improvement Program

The Port of San Francisco Commission has announced plans to spend some \$15 million for expansion and modernization of Pier 80.

The renovated terminal will have

a storage capacity of about 5,270 TEUs. It will be available to one large tenant or several smaller ones. Included in the expenditure will be \$7 million to pave the container storage area, \$3.5 million on utilities, and \$2 million for tracks to handle the container cranes. Completion of the project is scheduled for March 1988.

## Aquamaster Propulsion Units Installed In Self-Unloading Malaysian Bulker

The biggest application to date of the Aquamaster azimuth propulsion units manufactured by Hollming Ltd. Engineering Works in Rauma, Finland, is in a 5,000-dwt self-unloading cement carrier built by Sahab Shipyard in Malaysia for Perbadanan National Shipping Line of Kuala Lumpur.

The bulk carrier, designed by Shiptech Pte. Ltd. of Singapore, operates between Kuantam and Pulau Langkawi. As the traffic is mainly an interisland operation, the owner specified the need for high performance of the main propulsion system in the ports.

The Aquamaster twin-screw, hull-mounted type US 1401 propulsion units achieve full nominal thrust when the main engines are operating in reverse. In addition, a sideward thrust can be used when moving the vessel to quayside, eliminating the need for a bow thruster. This decreases hull resistance and

provides savings in fuel costs.

The main engines are two Mirreles Blackstone ESL 6 MK 2 diesels, each developing 1,310 bhp at 1,000 rpm. The two Aquamaster US 1401/3000 propulsion units have open propellers with a diameter of 2,100 mm and speed of 306 rpm. The units are classed by Det norske Veritas 1A 1R 280.

The main engines and propulsion units are controlled by an Aquapilot steering system. A main control panel is installed in the wheelhouse and a portable control can be used on the bridge wings. The rpm control of engines is electro-pneumatic through an E/P converter. The Aquapilot system is connected to an Anschuetz autopilot helm steering unit.

For further information and free literature on the Aquamaster propulsion units,

Circle 26 on Reader Service Card



**ELDEC**

# **TIME FOR A SWITCH...**

**After 20,000 cycles, when most mechanical switches are through, ELDEC solid-state switches are just beginning.**

In fact, lifespans of over one million cycles are typical. But that kind of reliability is no good if the electronics can't survive the marine environment.

**ELDEC non-contacting switches can stand up to the sea.**

- Encased in non-corroding, stainless steel.
- EMI hardened to **exceed** MIL STD 461B, Class A4.
- Operating range from  $-30^{\circ}$  to  $+65^{\circ}\text{C}$ .
- Meets MIL STD 901C, Grade A, Class 1 for shock.

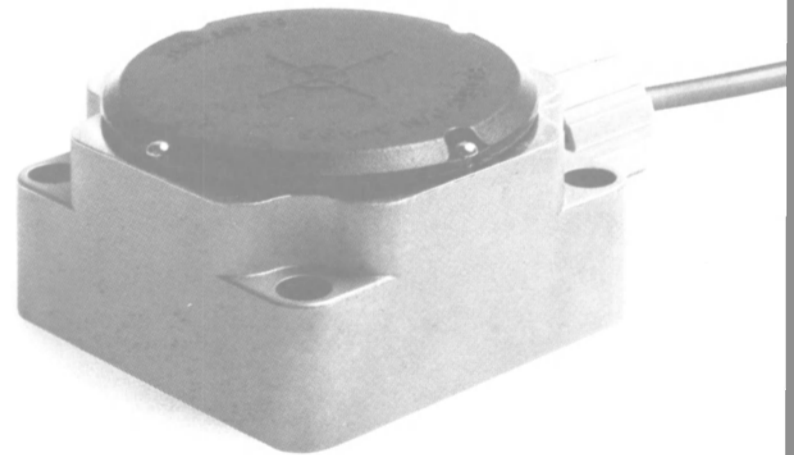
**Two wire AC and three wire DC switches for direct mechanical replacement.**

**The price is right.**

Purchase price is competitive with the best quality mechanical switches. And with less maintenance and replacements, life cycle cost savings are unsurpassed.

**Send for more information today.**

Once you compare, you'll agree, it's time for a switch.



**COMMITTED TO PERFORMANCE™**

Eldec Corporation, Lynnwood, Washington USA  
Tel. 206-487-4000 • TWX: 910-449-0873

Copyright © 1986 Eldec Corporation





The Anna C. features a triple-screw propulsion plant with three Cummins diesel engines coupled to Twin Disc gears. The vessel's primary function is to provide ferry service from New London, Conn., to Block Island, R.I.

## Eastern Marine Delivers Passenger Vehicle Ferry 'Anna C.' To Nelseco Navigation Company

Eastern Marine, Inc. of Panama City, Fla., recently delivered the Anna C., a specially designed and constructed passenger/vehicle ferry, to Nelseco Navigation Company, Inc. of New London, Conn. The vessel's primary function is to provide ferry service from New London to Block Island, R.I.

The all-steel, 197-foot by 39-foot by 14-foot ferry, designed by John W. Gilbert Associates, Inc. of Boston, features a triple-screw propulsion plant with three Cummins KTA 3067M diesel engines rated at 1,250 shp each at 1,800 rpm, coupled to Twin Disc MG 540 gears on a 4.5:1 ratio. The fixed-pitch propellers were supplied by Columbian Bronze, while the steering is provided by a Wagner model LD2-7.0-

45-EB2 steering system. In addition, the seakeeping and maneuverability of the vessel are greatly enhanced by the addition of a specially designed bulbous bow, the installation of a Harbormaster BT-200 bowthruster driven by a Detroit Diesel 6-71 engine and the installation of high-performance steering rudders manufactured by Willi Becker Engineering, Inc. These rudders incorporate a unique flap at the trailing edge which dramatically increases performance.

Steering stations equipped with both steering and propulsion controls are located on each bridge wing as well as on the aft end of the top deck to provide maximum visibility while maneuvering the vessel. The passengers will ride in comfortable

surroundings designed and decorated by Dampa, USA, with concession stands located on each enclosed passenger deck. Further, the entire top deck is available for the passengers unobstructed viewing pleasure.

The vessel was constructed to U.S. Coast Guard Subchapter T regulations, Vessels Under 100 Gross Tons, and is capable of carrying 1,300 passengers and 42 vehicles at one time. During sea trials, the vessel achieved a speed of 19 knots.

The basic design for the Anna C. was derived from the 187-foot ferry Carol Jean, which was also built by Eastern Marine and delivered in 1985. Since that time, the Carol Jean has enjoyed a very successful career operating between Point Judith, R.I., and Block Island. The Anna C. will provide an extension of this service.

Eastern Marine is engaged in the design and construction of passenger/vehicle ferries, fishing vessels, inland and offshore tugs, barges, cruise ships, specialized military and governmental agencies ships, offshore support vessels, and repair and conversion operations.

For free literature on Eastern Marine's facilities and capabilities,

Circle 24 on Reader Service Card

### ANNA C. Major Suppliers

Main engines	Cummins
Reduction gears	Twin Disc
Propellers	Columbian Bronze
Steering system	Wagner
Bow thruster	Harbormaster
Bow thruster engine	Detroit Diesel
Steering rudders	Willi Becker Engineering

## For anode recoating it pays to call out the experienced hands.

When it comes to the recoating of shipboard electro chlorinator anodes for marine fouling control systems, Engelhard is the expert's choice.

**Durability and Long Life.** Precious metals are our specialty.

And with over 700 shipboard installations since 1972, you can be certain that Engelhard's new and recoated anodes and rebuilt generating cells are made to be dependable.

**High Quality Control.** Every step in the recoating of your anodes and rebuilding of generating cells is carefully monitored by experienced professionals who understand the demanding rigors of constant exposure to seawater.

**One Week Turnaround.** With offices and service

centers throughout the world, Engelhard have your anodes recoated at our factory in seven days. No matter where in the world you are. With no sacrifice in quality.

**Technical Service.** Whenever and wherever you need assistance we can be there.

Our technicians are thoroughly trained and are always available for on-site consultation anywhere in the world.

When it comes to recoating anodes and rebuilding generating cells, you can't beat an experienced hand.

For technical information and pricing for all makes and models write Engelhard Corporation, Precious Metals Coated Anodes, Menlo Park, CN 28, Edison NJ 08818. Or call toll free 1-800-932-0444, in NJ 1-800-624-0818. Telex 13-8552 (domestic), 21-9984 (international).

ENGELHARD

## COMSAT Marks 10 Years Of Commercial Maritime Satellite Communications

COMSAT Corporation of Washington, D.C., is this year celebrating the 10th anniversary of the world's first commercial maritime communications satellite system. The first commercial telephone transmission through the company's MARISAT System took place on July 9, 1976.

According to COMSAT Maritime Services officials, the first call passed routinely through the system. It was a business call between the seismic ship Deep Sea Explorer, searching for oil in the Indian Ocean off the coast of Madagascar, and the home office of Phillips Petroleum Company in Bartlesville, Okla.

The MARISAT System was designed and developed by COMSAT General, a subsidiary of COMSAT Corporation. COMSAT General successfully launched three MARISAT satellites in 1976, one over each ocean region, which allowed cost-effective sharing of satellite telecommunications services for both military and commercial maritime interests.

In the 10 years since the initiation of maritime satellite communications, the system has grown dramatically along with the range of services available. In 1982 the International Maritime Satellite Organization (INMARSAT) was formed, and today 46 countries are members. More than 4,000 vessels and offshore oil platforms have been equipped with ship earth stations, allowing more than 300,000 people per day to have access to satellite communications on the high seas.

COMSAT Corporation was selected to represent the U.S. in INMARSAT, and currently utilizes and therefore owns 29 percent of the system. COMSAT Maritime Services oversees the company's role in INMARSAT, and has been instrumental in developing and marketing new services for the seafaring community. It was responsible for the first live television satellite broadcast to a ship at sea when it transmitted the Super Bowl game to the Queen Elizabeth 2 off the coast of Peru early this year.

For additional information and free literature on COMSAT's maritime satellite services,

Circle 58 on Reader Service Card

## SEACO Announces Major Expansion

Arthur C. Novacek, president and chief executive officer of Eller & Company, Inc., recently announced the merger of all Eller stevedoring and terminal activities in the South Atlantic ports of Wilmington, Charleston, Savannah and Jacksonville into Southeast Atlantic Cargo Operators (SEACO). Mr. Novacek stated that Eller will thus become one of the principal owners of SEACO. Eller will continue to perform its agency activities in these ports. All other Eller activities will continue as before.

Circle 134 on Reader Service Card

### Stolt-Nielsen Ship Management Moves To Panama City, Fla.

Stolt-Nielsen Inc. has completed the move of its Ship Management Department from Greenwich, Conn., to Panama City, Fla. The company, a market leader in the worldwide parcel tanker trade, made the move to secure long term overhead cost savings to stay competitive with other ship managers operating internationally and to keep fleet management of Stolt Tankers' owned tonnage "in house."

Stolt Tankers currently owns 29 oceangoing parcel tankers which will be managed from the Panama City office. A 30th ship will be delivered shortly. Stolt-Nielsen Ship Management markets a full array of ship management services including crewing, purchasing and technical services to shipowners who can benefit from the company's expertise.

The selection of Bay County, Fla., for the new office followed a year-long study of several potential relocation sites in the U.S. and Europe. **Timothy G. Berkel**, senior vice president and general manager of the Ship Management Department will head up the new office.

This move does not affect any of the other divisions of Stolt-Nielsen Inc. Tanker marketing and cargo operations, terminals, tank containers, transportation services and corporate finance will remain at the company's Greenwich, Conn., offices.

The address of the new Panama City office is: Stolt-Nielsen Inc., Ship Management Department, Balboa Building, 1000 West 15th St., Panama City, Fla. 32406-5309; telephone: (904) 784-1299; telex: RCA 235917 or Western Union 965944; and telecopier: (904) 784-1503.

### Conversion Of 'Monterey' Underway At Dillingham Shipyard In Portland

In what will eventually be a \$30-million reconstruction of the former Matson passenger liner Monterey into a luxury cruise ship, the vessel was towed from an anchorage in Alameda, Calif., to Dillingham Marine's shipyard in Portland, Ore., for drydocking and hull repairs.

Aloha Pacific Cruises, the company that is buying the ship from the International Organization of Masters, Mates and Pilots, plans to operate the renovated vessel on interisland cruises in Hawaii beginning in the summer of 1987.

Following her stay at the Dillingham yard, the Monterey is scheduled to go to the Tacoma Boatbuilding yard in Tacoma, Wash., for two months of superstructure work. This will be followed by additional months of refurbishing of the interiors of Wartsila's Helsinki shipyard in Finland. As part of the overhaul, additional cabins will be added to increase the passenger capacity from 411 to 639.

Circle 280 on Reader Service Card →

### Chevron Offers Free Color Guide To Inland & Coastal Marine Lubricants

Chevron, USA, of San Francisco, Calif., is offering a free color brochure on their inland and coastal marine lubricants.

This fold-out color brochure from Chevron contains information of

Chevron Delo Marine and AW Machine Oils, NL Gear Compounds, Marine Oil 220X, Dura-Lith Grease EP2, Polyurea EP, Pinion Grease MS, and Ultra-Duty Grease. In addition, data sheets are included on Chevron Delo Marine Oil 471, 473 and 194, as well as a quick reference guide to Chevron marine lubricants. The quick reference chart provides information on the proper lubrication recommendation for such

equipment as diesel engines, steam turbines, reverse and reduction gears and steering systems.

The brochure is highlighted by several color photographs of inland and coastal vessels and machinery.

For a free copy of this informative and comprehensive brochure, along with the data sheets and quick reference guide from Chevron,

Circle 37 on Reader Service Card



MAN B&W Diesel and its licensees:

the competitive edge

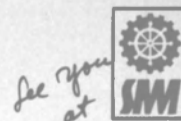
in two-stroke and four-stroke Diesel engineering

as a result of long-standing experience,

consistent research and development.



WORLDWIDE SERVICE





## SMM '86

### Ship, Machinery and Marine Technology International Trade Fair

Hamburg, West Germany September 23-27

Despite the current business climate prevalent in the shipping, shipbuilding and offshore sectors, the Ship, Machinery & Marine Technology International Trade Fair (SMM) has strengthened its leading position again this year. To take place in Hamburg, West Germany, September 23-27, its success is the result of intensive sales campaigns and effective presentations by the Hamburg Fair organization in the U.S. and in countries of Northern and Southern Europe.

In contrast to some events in other countries, SMM'86 can point to a genuine increase in the number of exhibitors. This year more than 500 direct exhibitors from 25 countries

**Photo:** Congress Centrum Hamburg, site for the Ship, Machinery & Marine Technology International Trade Fair.

are expected. First-timers among the joint venture exhibits are Norway and Bulgaria. There will also be 12 other national cooperative stands.

Exhibitors view the success of SMM as a direct consequence of the highly qualified and international makeup of the trade fair visitors. More than 30,000 are expected to come to this year's SMM in Hamburg from all over the world. For the first time, a country—the People's Republic of China—has been chosen as "host nation" for the trade fair. China has indicated that a high-ranking official from its shipbuilding sector will speak at the SMM'86 Opening Ceremony.

Among the regular exhibitors at this biennial event are virtually all of Europe's leading shipbuilding nations, plus a great many important

groups from overseas, including the shipbuilding industries from the U.S., and marine equipment leaders from Japan and Korea.

This important maritime trade fair, being presented for the 12th time, is organized by Hamburg Messe and Congress GmbH, the fair authorities, in cooperation with the Association of German Marine Engineers and the German Shipbuilding Industry Association. It is sponsored by Germanic Lloyd, the Marine Engineering Society, the Shipyard and Offshore Specialists' Section of the German Machinery and Plant Manufacturers' Association, and the Association of Industrial Marine Technology.

In conjunction with SMM'86, an International Congress on Ship Technology will take place on Wednesday, September 24.

At the last SMM exhibition held in 1984, 31,114 visitors from 44 countries (including Argentina, Australia, Brazil, China, Korea, Singapore, the U.S., and the USSR) came to Hamburg—impressive evidence of the significance of this trade fair for the international shipbuilding industry. Some 58 percent of these visitors were either senior or middle management, and 83 percent said that SMM was of great importance as a market for information and placing orders.

#### Specialist Equipment

Shipyards and suppliers from the world's traditional shipbuilding countries are increasingly discovering gaps in the market for specialist vessels. This will be clearly shown by much of the equipment on dis-



play in the SMM'86 range of exhibits.

Ship's cranes are getting slimmer, more mobile, and faster. The Nenzing-based Liebherr-Werk has set new standards in high-technology and safe, economical onboard crane operations with its new crane systems for combined river and seagoing vessels. This new generation of slimline cranes with a capacity of up to 80 tons will be on view. The slim design of these new models, the B/SM and the BW/SM, not only prevent any unnecessary loss of container storage space but also means that even containers placed right next to the cranes can be handled easily.

Special-purpose cranes for Rhine and seagoing ships will be on view at the Hatlapa stand. These extremely low-profile cranes are especially designed to enable seagoing container-ships to pass under the bridges of the Lower Rhine. This well-known German manufacturer of deck equipment for seagoing ships will also exhibit an extensive range of warping capstans, warping winches, and deck machinery with high- and low-pressure operation.

The "Profi" pneumatic hoists manufactured by J.D. Neuhaus are distinguished by their light weight and impressive lifting capacity. Whether designed to lift 100 kilograms or 100 tons, these pneumatic hoists are said to be ideally suited for use in shipyards or on board ships because of their sensitive controls and damp-resistant qualities.

Deck equipment will also be on view at Kvaerner Brug's stand. This subsidiary of the Norwegian Kvaerner Group was founded in Bremen at the end of 1985. It supplies hatch covers of all shapes and sizes for oceangoing ships, including self-actuated covers, and specialist systems for RO/RO ships and bulk carriers.

SMM has always included a wide range of exhibits covering the field of navigation. Honeywell ELAC Nautik GmbH will unveil its brand new LAZ 2310 color echo sounder, a compact but extremely powerful instrument for the fishing industry. The company's new long-range FS 3700 CS color sonar with an all-round display on a 14-inch screen will also be on display.

The Hamburg firm of C. Plath will present a complete line of navigation equipment. With its Satellite Adaptive Fuel Economizing System, Plath has integrated some standard navigation equipment to form a moderately priced system that not only increases safety on board ships at sea but also reduces fuel consumption. Exhibitor H.E. Eissing will present a distribution network for the navigation equipment manufactured by Plath and other companies, as well as an installation and maintenance service.

A powerful 400-watt lamp for shipping will be on view at the stand of WISKA Hoppmann & Mulsow. This panel lamp made of seawater-resistant aluminum insures optimum distribution of light through a reflector made of pure aluminum. Another exhibitor, Zollner, will display its acoustic signaling equip-

ment.

### Shipboard Safety

Safety technology in shipbuilding and ship operations is another aspect that will be shown in many displays at SMM'86. Whereas controllable-pitch and lateral-thrust pro-

pellors, fully automatic onboard operating systems, satellite communications, and computers have become an integral part of ocean shipping during the past two decades, SMM'86 will show that the latest developments are also concentrating on safety aspects and environmental protection.

The new IMO safety regulations

have not only been embodied in newly passed national regulations and statutory provisions, but have also been increasingly taken into account in newly developed safety equipment for shipboard use. The same is true of the numerous innovations in the field of on-board

(continued)

Call us at the  
International  
Trade Fair  
Ship, Machinery,  
Marine Technology  
Hamburg, September 23 - 27, 1986  
Hall 8, Stand 8040

## Operations in Explosion Hazard Zones? Use JDN Air Hoists and JDN Monorail Air Hoists.

Compressed air is the absolutely safe form of drive energy for use in explosion hazard zones. On the one hand, because air does not cause sparks and cannot, therefore, lead to ignition – and, on the other hand, because no potentially harmful or even lethal electric shocks occur, even in wet operating areas. JDN lifting equipment is primarily used in areas of maximum risk, such as BoP zones; here it is fitted with chains and hooks made of special-purpose spark-proof metal, supplied by JDN for custom designs.

Another advantage is that the weight of JDN air hoists is relatively low in relation to their load-bearing capacities – that makes them much easier to transport.

Finally, it should also be mentioned that the lifting and lowering speed can be regulated on hoists with cable control. This is an essential feature in cases where highly accurate position control is required.

If JDN air hoists did not already exist – they would have to be invented for off-shore technology.

Our informational brochure contains detailed data and descriptions. Just write to us – we shall be more than pleased to help.

**J. D. NEUHAUS HEBEZEUGE GMBH & CO · D-5810 WITTEN-HEVEN**

Telefon (0 23 02) 208-0 · Telex: 8229162 · Telefax (0 23 02) 208-286

Circle 207 on Reader Service Card

(continued)

waste disposal that will be on view at SMM'86.

A simple fire-bulkheading system, "Pyro-Safe," will be shown by SVT-Brandschutz & Service. It fits into any available opening and the bulkhead element is made up of spe-

cial mineral-fiber plates plus an intumescent fire-protection coating. The latter is characterized by a high degree of elasticity and the fact that it is non-hygroscopic. This bulkhead element can even be retrofitted at a later stage. Pyro-Safe can also be used to protect cables and pipes against the effects of fire, water, and gas.

All-round fire protection for on-board ship operations, fireboats, or

for cargo-handling and storage facilities for dangerous goods in ports is offered by Albach, whose Alco Monitors are said to meet all the requirements of modern high-performance firefighting in the maritime field.

Another exhibitor, Minimax, offers a variety of firefighting methods—water, foam, and halogenated hydrocarbons. For maritime use, low-expansion foam firefighting equipment has proved extremely ef-

fective in dealing with burning oil at tank terminals in port, with combined foam/water monitors proving effective in fighting fires aboard ships. Minimax also offers sprinkler equipment. This firm designs and installs customized firefighting systems that meet all applicable regulations and international safety provisions.

High-pressure cleaning, even in the most inaccessible places, is guar-

## S.P. RADIO GENERAL AGENTS:

**ARGENTINE**  
Oton R. Klein S.A., 1102 Buenos Aires  
☎ 362-7770, 362-7357, 361-1260

**AUSTRALIA**  
E. S. Rubin & Co. Pty. Ltd.  
Artarmon N.S.W. 2064, ☎ 439-2333

**BAHRAIN**  
Aeradio Technical Services WLL,  
Mina Sulman Port, ☎ 243390

**BELGIUM**  
Antwerp Marine Radio Company N.V.  
2000 Antwerp  
☎ (03) 2337780, 2336092, 2310487

**BRAZIL**  
O.L. Naval Ltda., Rio de Janeiro, ☎ 252-4148

**CANADA**  
Stiles Communications Limited,  
Montreal, Quebec H3P 3B9, ☎ (514) 731-6123

**CHILE**  
Equipos Industriales S.A.C.I.  
Santiago, ☎ 56-2-6990506

**CYPRUS**  
A. P. Hadjipieros, Limassol, ☎ (051) 63905

**EGYPT**  
Pan-Arab Shipping Co.  
Alexandria, ☎ 808601, 4918337  
Suez Electronics Free Zone S.A.E.,  
Alexandria, ☎ 806899, 804196  
Suez Electronics Engineering & Trading Ltd.,  
Cairo, ☎ 2450782

**FINLAND**  
Oy Hedengren AB, 00101 Helsinki, ☎ 670211

**FRANCE**  
Avon S.A., 13002 Marseille, ☎ (91) 90.71.71  
Compagnie Radio Maritime C.R.M.  
13011 Marseille, ☎ 33/91 45 35 44

**GABON**  
Thomson CSF Gabon, Libreville, ☎ 70-01-00

**GERMANY**  
ELNA GmbH  
2084 Rellingen/Hamburg, ☎ 04101/3011

**GREECE**  
Elenava Ltd.  
104-31 Athens, ☎ 5225894, 5241634

**HOLLAND**  
Radio Holland B.V.  
1069 CC Amsterdam, ☎ 020-101972

**HONG KONG**  
Radio Holland B.V., Kwai Chung N.T.  
☎ 0-239007

**ICELAND**  
Radiomidun Ltd., Reykjavik, ☎ (91) 622640

**INDIA**  
Elcome Marine Services Private Ltd.  
Bombay 400 001, ☎ 2043703, 2040607

**ITALY**  
Generalmare S.R.L. (Pleasure/Fishing)  
16145 Genova, ☎ (010) 369066, 303198  
Societa Italiana Radio Marittima S.I.R.M.  
(Deep Sea), 00143 Rome, ☎ 5910441  
Compagnia Generale Telemar (Deep Sea),  
00196 Roma, ☎ 3960241

**THE IVORY COAST**  
Compagnie Radio Maritime C.R.M.  
Abidjan 01, ☎ (225) 356727

**JAPAN**  
Engineering Equipment Co., Ltd.  
Tokyo 105, ☎ 03-572-7071

**MALTA**  
Medcomms Ltd., Gzira, ☎ 35521

**MOROCCO**  
Moroc Aviation  
Casablanca, ☎ (212) 241267, (212) 241268

**NEW ZEALAND**  
Cossens & Black Ltd., Dunedin, ☎ 774-215/6

**NIGERIA**  
Nelarcomms Nigeria Ltd.  
Lagos State, ☎ 870517

**NORWAY**  
Telaeg A/S, 1346 Gjetlum (Oslo), ☎ (02) 541190

**PORTUGAL**  
Mendes de Almeida, Lda  
1200 Lisbon, ☎ 567794, 667710, 660654

**QATAR**  
Eastern Technical Services Co., Doha, ☎ 441412

**SENEGAL**  
Cie Radio Maritime, Dakar, ☎ (221) 210930

**SINGAPORE**  
Radio Holland B.V.  
Singapore 9158, ☎ 65-4673144

**SOUTH AFRICA**  
Marconi Marine (South Africa) (Pty.) Ltd.  
Cape Town 8001, ☎ 215860

**SPAIN**  
Nautical Luis Arbulu, S.L.  
28016 Madrid, ☎ (91) 457 05 42/457 05 79

**SWEDEN**  
Televerket Radio, 123 86 Farsta  
☎ 08/7134500  
Navelco Marin & Industri AB  
42131 Västtra Frolunda, ☎ 031-490205

**TAIWAN R.O.C.**  
Pei Say Enterprise Co. Ltd.  
Taipei, ☎ (02) 503-0048

**TUNISIA**  
Compagnie Tunisienne d'Electronique  
Tunis, ☎ 894133

**TURKEY**  
Hikmat Bolulu, Istanbul, ☎ 1434576, 1476221  
Elektro-Deniz Ltd. Sti., Istanbul,  
☎ 1434937, 1434938

**UNITED ARAB EMIRATES**  
Elcome International, Dubai, ☎ 471335, 373426

**UNITED KINGDOM**  
S. P. Radio (U.K.) Ltd., Croydon,  
Surrey CR9 2XT, ☎ 01-686 5363/4

**URUGUAY**  
Electromarittima Uruguayua Ltda.  
Montevideo, ☎ 202386

**USA**  
Radio Holland-USA B.V., Houston,  
Texas 77033-1041, ☎ (713) 649-1048

**VENEZUELA**  
Equipex-Radio Holland S.A., Caracas 1060A,  
☎ (02) 7518324, 7527480

**YUGOSLAVIA**  
Belam, 51000 Rijeka, ☎ 051-30555, 38122

# "SAILOR"

## SSB Short Wave Programme 1000/B with Aerial Coupler 400 Watt PEP into the Aerial

### Flexibility

SAILOR Programme 1000/B is able to meet all maritime communication requirements within the frequency range 1.6-27.5 MHz. Option for frequency range 1.6-8.5 MHz with continuous coverage.

Furthermore is it possible to incorporate optionally, 2 supplementary bands freely selected in the ranges 8.5-10 MHz and 11.5-27.5 MHz. The receiver covers from 10 kHz to 30 MHz continuously.

SAILOR Programme 1000/B gives assured radiocommunication by telex as well as telephony over long distances - and is also ideal for point-to-point communication.

### Automatic Tuning

### Easy Installation

The station can be installed precisely where it is most convenient for the operator and need not be grounded. SAILOR Programme 1000/B is very simple and fast to operate.

### Automatic Telex

The receiver and transmitter with the aerial coupler and the telex modem SAILOR H1240 form a very effective radiotelex station. Combined with scanning receiver SAILOR R1121 it becomes a fully automatic Radiotelex Station. The system works in ARQ-mode on one aerial.

Furthermore the new transmitter and receiver are fast enough to have a telex connection on one frequency (Simplex) in ARQ-mode.

### Low Power Consumption

Owing to the high efficiency of the transmitter output stage and the switch mode power supplies, the power consumption is very low.

### A Real Radiotelephone

SAILOR 1000/B has separate receiver and transmitter units (full Duplex) and a transmitting power high enough for world-wide communication.

Easy installation, high reliability, and world-wide service are common to all SAILOR products.



### Aerial Coupler AT1500

The transmitter is provided with an aerial coupler AT1500, which is completely weatherresistant and can be placed directly at the footpoint of the aerial, either outdoors or indoors, which means no loss of transmitter power.



## "SAILOR" PROGRAMME 1000/B

### S. P. RADIO A/S

DK-9200 AALBORG SV · DENMARK · TEL. INT.: +45 8 18 09 99  
TELEX: 69 789 SPRAD DK · TELEFAX INT.: +45 8 18 67 17



Circle 271 on Reader Service Card

# "SAILOR"

anteed by the "Waschboy" high-pressure cleaners manufactured by WAP-Maschinen Guido Oberdorfer. The cleaning fluid is forced out at a pressure of 70 bar.

Another exhibitor, Hydrobar, will also present high-pressure cleaning technology. The company estimates the world market for this type of equipment at about DM300 million (about \$140 million), and claims to have a sizeable market share. The firm has designed equipment for use in refineries and oil-handling facilities in which the high-pressure technique, previously used only with cold water and without any chemicals, has been combined with heat exchangers to make use of hot water.

Onboard safety is certainly very much a case of good orientation of the crew in case of power failure or fire. Permalight GmbH will exhibit a product for such emergencies. Irrespective of whether there is any daylight or artificial light present, the company's phosphorescent safety/emergency markings—supplied as stickers, signposts, sheets, emergency exit plans, etc.—point the way to firefighting equipment, lifeboats, and the like.

#### Conference Program Wednesday, September 24

9:30 am—Opening of the Conference by **Ernst A. Harm**, chairman of the Hamburg Branch of the Association of German Marine Engineers. Introductory paper by Prof. **K. Illies**, Schiffbautechnische-Gesellschaft. Moderator: **W. Schottelndrever**, Association of German Shipowners

10:00 am—"Measures To Improve the Reliability of Propulsion Units with Medium-Speed four-stroke Diesel Engines," by **Wolfram Lochbichler**, MAN B&W Diesel GmbH, Augsburg

10:30 am—"Improved Reliability of Medium-Speed Propulsion Units," by **L. Neut**, Stork-Werkspoor, Amsterdam

11:00 am—Discussion  
Moderator: **Kurt Dohmel**, Deutsche Shell Tanker GmbH

11:30 am—"Engineroom Fittings for the Ships of the Future," by **K.-H. Paetow**, Howaldtswerke-Deutsche Werft AG, Kiel

12 Noon—Testing Ship's Main Engines with Brake Wheels," by **A. Nolte**, Bremer-Vulkan A.G., Bremen

12:20 pm—Discussion

12:45 pm—Lunch

Moderator: Prof. **G. Peters**, Fachhochschule Hamburg

2:00 pm—"Integrated Command and Monitoring Systems for One-Man Watch and Running Operations from the Ship's Command Station," by **P. Grafoner**, AEG Shipbuilding Division

2:30 pm—"Practice-Oriented Automation for Ships with a Future," by **H. Schreiber**, Siemens AG, Erlangen

3:00 pm—Discussion

3:30 pm—Adjournment

#### SMM '86 EXHIBITORS

##### Company

##### Hall

HTS (HANDEL MIT TECHNISCHEM SYSTEMEN) ERICH KELLERER LUDWIG HUNGER WERKZEUG-UND MASCHINENFABRIK GMBH

AN6

8

HY-POWER HYDRAULIK-VERTRIEBS GMBH  
HYDROBAR HOCHDRUCK-REINIGUNGSTECHNIK GMBH  
IBAK HELMUT HUNGER GMBH & CO.KG  
IBH, INGENIEURBURO HARM  
INA WALZLAGER SCHAEFFLER KG

20G

3

5

3EG

2EG

INDAR WERKSVERTRETUNG  
ING.-BURO FUR ELEKTRO-TECHNIK  
INGENIEURGEMEINSCHAFT MEERESTECHNIK + SEEBAU GMBH  
INSTITUT F. ANGEWANDTE PHYSIK, UNIVERSITAT KIEL  
INSTITUT F. SCHIFFBAU UNI HH

5

7

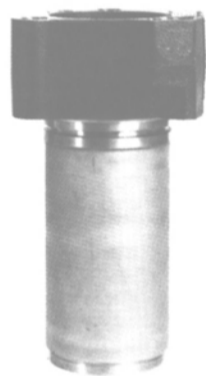
5

1EG

MÄRKISCHES WERK, HALVER



# AT THE HEART OF YOUR DIESEL ENGINES.



valve cages

valve cage assemblies



seat inserts

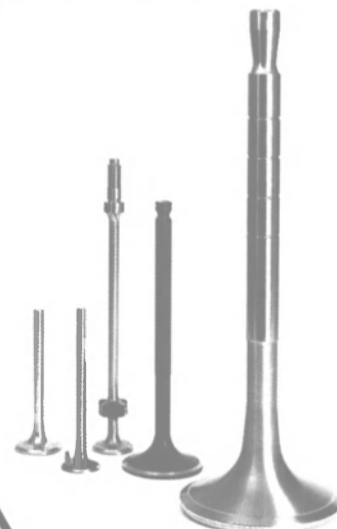


valve springs

valve spindles



valve rotators



CLAIM YOUR ATTENTION TO KNOW-HOW AND EXPERIENCE  
IN DEVELOPING ECONOMICAL SOLUTIONS FOR YOUR DIESEL ENGINES.  
DO CONTACT US!

Märkisches Werk GmbH · P.O. Box 1442 · D-5884 Halver  
Phone (02353) 72274 · Telex 8263649 mwhd · Telefax (02353) 72255

SMM '86 Hamburg · 23.—27.9.1986 · Hall 11 EG · Stand 11019

Circle 16 on Reader Service Card →

# SMM '86

(continued)

Company	Hall	Company	Hall	Company	Hall
INTEC INJECTOR TECHNIK GMBH	1EG	L'ORANGE GMBH	6	KNUMANN GMBH & CO.KG	5
INTERING GMBH	5	WILHELM LAYTHER GMBH	2EG	HANS-ULRICH PILLEKAMP	5
INTERNATIONAL FARBENWERK GMBH	10EG	LBL-ELEKTROTECHNIK LITTAU & BOLLE GMBH & CO.KG	5	ANTON PILLER GMBH & CO.KG	5
INTERSCHALT GMBH & CO.KG	5	LE BRONZE INDUSTRIEL DEUTSCHLAND GMBH	5	ING. BURO G. PINNOW IGP	5
INTRA-AUTOMATION GMBH	20G	LEHMANN & MICHELS GMBH	5	PISTER-KUGELHAHNE GMBH	20G
IWK REGLER UND KOMPENSATOREN GMBH	20G	LEHRGEBIET GRUNDLAGEN DER MEERESTECHNIK	7	P.I.V. ANTRIEB WERNER REIMERS GMBH & CO.KG	6
M. JURGENSEN GMBH & CO.KG	6	LEISTRITZ MASCHINENFABRIK PAUL LEISTRITZ GMBH	10EG	PAUL PLEIGER, MASCHINENFABRIK	2EG
JASTRAM-WERKE GMBH & CO.KG	7	FRIEDRICH LEUTERT GMBH & CO.	5	PLESSEY STECKVERBINDER GMBH	5
A. JOHNSON & CO. GMBH	3EG	F.A.C. VAN DER LINDEN GMBH CO.	10G	TRW PLEUGER UNTERWASSER-PUMPEN GMBH	10EG
FRITZ A. KAHLER	2EG	PAUL LINDENAU GMBH & CO.KG KOMMANDITGESELLSCHAFT	7	PRUFTECHNIK	1EG
KABELWERKE FRIEDRICH C. EHLERS	5	LIPPOLD HYDRAULIK GMBH & CO.	2EG	PRAKLA-SEISMOS GMBH	5
A. VAN KAICK NEU-ISENBURG GMBH & CO.KG	8	LOHER GMBH	5	E. PRANG + CO.	3
KARBERG + HENNEMANN KG	6	WILLIBRORD LOSING	2EG	PREUSSAG-MINIMAX AG	2EG
WALTER KIDDE GMBH	2EG	W. LUDOLPH KG	5	ROBERT PRINZ GMBH & CO.	10EG
GEBRUDER KLUVRE	7	LUMITAS-ELEKTRO GMBH	5	PUMPEN- UND MASCHINENBAU FRITZ SEEBERGER KG	20G
GUNTHER KLEIN INDUSTRIEBEDARF GMBH	2EG	MARKISCHES WERK GMBH	11EG	DIPL.-ING. ECKART RAMERT	5
KLOCKNER HUMBOLDT DEUTZ AG	8	M.A.N.-B&W DIESEL GMBH	6	ELECTRONISCHE GERATE KG	5
KLOCKNER-MOELLER GMBH	11EG	HERMANN MULHEIMS KG	4	RANDER & CO. GMBH	20G
KLOCKNER-WERKE AG	8	ERHARD O. MULLER	5	RASMUSSEN GMBH	10G
AUGUST G. KOCH MASCHINENFABRIK KOLB GMBH	20G	GEBR. MULLER APPARATEBAU GMBH & CO.KG	10G	REINZ-DICHTUNGS-GMBH	1EG
KOLBENSCHMIDT AG	6	MUTEC, MESS-UND REGELTECHNIK GMBH	10G	RENKEN & CO. GMBH	1EG
KONUS-KESSEL GESELLSCHAFT FUR WARMETECHNIK GMBH	3EG	MACGREGOR-NAVIRE GMBH	6	REX INDUSTRIE PRODUKTE	5
KRUPFGANZ + JUNGLING VERLAG	10EG	MAHLE GMBH	1EG	GRAF VON REX GMBH & CO.KG	5
KROHNE MEBTECHNIK GMBH & CO.KG	5	MAHNKE GMBH	6	ROCHEM-CHEMIE-VERTRIEB GMBH	1A
KRUPP ATLAS ELEKTRONIK GMBH	10EG	MANNESMANN	6	ROSS INDUSTRIE GMBH	6
KRUPP MAK MASCHINENBAU GMBH	6	MTI MANOVRIERTECHNISCHES INSTITUT GMBH	1EG	ERICH ROTTMANN KG	6
KRUSE TECHNIK GMBH & CO.KG	10G	MAR-TEC MARINE BERATUNGS- U. HANDELSGES. MGH	2EG	RSK STAHL + FERTIGTELLE VERTRIEBS GMBH	10G
WILHELM KOPP ZELKAUTSCHUK KG	10G	MARINE ELECTRONIC SCHIFFSAUSRUSTUNGEN GMBH	10EG	RV REISE- UND VERKEHRS- VERLAG GMBH	20G
KOSTER & CO.	10G	MIM MARINE-UND INDUSTRIE-MONTAGE GMBH	10EG	RWO MASCHINENFABRIK, ARMATUREN UND APPARATEBAU GMBH	20G
KSB KLEIN, SCHANZLIN & BECKER AKTIENGESELLSCHAFT	10EG	OTTO MARKERT & SOHN KG	5	OTV-SCHIFFHARTSSCHULE GMBH	10G
KVAERNER BRUG (DEUTSCHLAND) GMBH	2EG	MARKON ENGINEERING (DEUTSCHLAND) GMBH	7	SUDDEUTSCHE KUEHLERFABRIK, JULIUS FR. BEHR GMBH & CO. KG	6
LANGERER & REICH	6	MASCHINENBAU GABLER GMBH	7	H. SAACKE KG	20G
		MASCHINENFABRIK STROMAG GMBH	6	SALEN & WICANDER GMBH	5
		ME MEERESTECHNIK-ELEKTRONIK GMBH	1EG	WILHELM SANDER FERTIGUNG GMBH	2EG
		METINGO METTE GMBH & CO.KG	20G	J.P. SAUER & SOHN	4
		JOS. L. MEYER	7	GEORG SCHONEMANN UND CO.	2EG
				SCHAFFRAN PROPELLER LEHNE & CO. GMBH & CO.KG.	6
				SCHALLER AUTOMATION	
				INDUSTR. AUTOMATIONS-TECHNIK KG	5
				SCHICHAU UNTERWESER AG	7
				SCHIFFFAHRTS-VERLAG "HANSA" C. SCHROEDTER & CO. GMBH	7
				SCHIFFKO SCHIFFKONSTRUKTION-UND ENTWICKLUNG GMBH	5
				SCHIFFSDIESELTECHNIK KIEL OFF & GROSSE-HELLWEG GMBH	6
				EUGEN SCHMIDT & CO. GETR. U.. ANTRIEBSELEMENTE GMBH	6
				W. SCHMIDT GMBH & CO.KG	4
				SCHMITZ + SCHULTE GMBH + CO.KG.	20G
				FRANZ SCHNEIDER KG	
				SCHOLL-APPARATEBAU GMBH	
				SCHOTTEL-WERFT JOSEF BECKER GMBH & CO.KG.	AN 6/7
				APPARATECHNIK HARALD SCHONSTEIN GMBH	2EG
				A.W. SCHULTZE GMBH	2EG
				W.G. SCHULZ GMBH	5
				WERBEAGENTUR DR. KUEHL GMBH	
				SCHWEIBWERK UND MASCHINENBAU OTTO SCHUCHMACHER GMBH	2EG
				SCHWER-FITTINGS	20G
				EG & G SEALOL GMBH	10G
				SEEHAFEN-VERLAG	7
				SEMPRESS PNEUMATIK GMBH	10G
				SERCK GMBH	
					2EG/AN3
				ZU HD. HERRN STANICKI SET SOFTWARE-ENGINEERING TONGUC	10G
				SIBA SICHERUNGEN-BAU GMBH	5
				SIEMENS AKTIENGESELLSCHAFT	7
				J.J. STETAS KG, SCHIFFSWERFT SMBH & CO.	7

## SCHOTTEL

for progressive propulsion

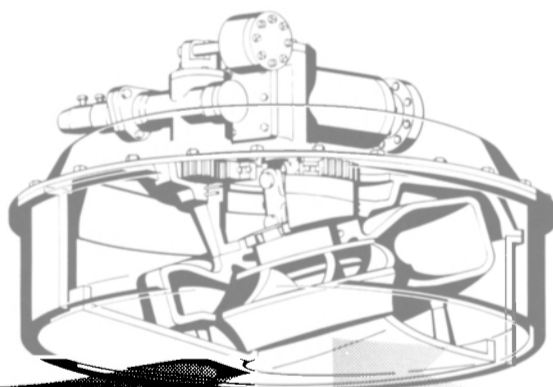
**SCHOTTEL-Pump-Jets**  
**SCHOTTEL-Navigators**  
**SCHOTTEL-Cone-Jets**  
**SCHOTTEL-Thrusters**  
**SCHOTTEL-Rudderpropellers**  
 from 15 – 4,500 kW

The service proven **SCHOTTEL** Systems are available in numerous propulsion and steering units and manoeuvring aids for all kinds of ships

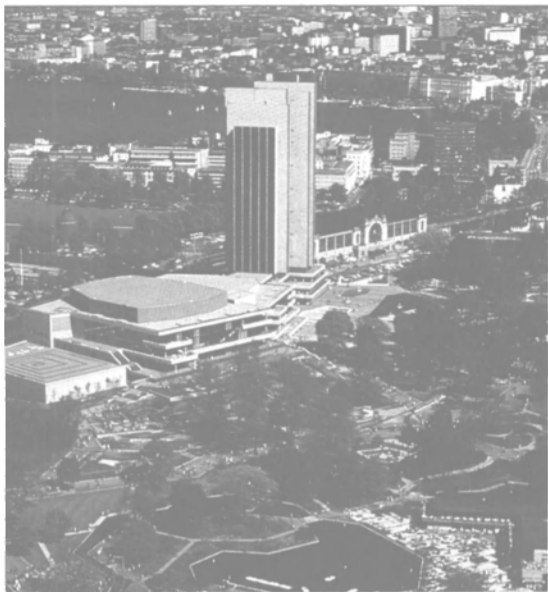
SCHOTTEL-WERFT, D-5401 Spay / West Germany, Tel.: 02628 / 610, Teletex: (17) 262891 SW SPAY  
 SCHOTTEL OF AMERICA, INC., 8375 N.W. 56 Street, Miami / Florida 33166, Tel.: (305) 592-7350

The SCHOTTEL-Group offers world-wide sales and service through SCHOTTEL companies located in Hamburg, The Hague, London, Paris, Genoa, Basle, Vienna, Miami, Buenos Aires, Porto Alegre, Singapore, Sydney and representatives throughout the world.

**See us at SMM '86 in Hamburg · Hall 7 · Stand 7016**



Circle 16C on Reader Service Card



Company	Hall
VERLAG MARITIM GMBH	7
VERSUCHSANSTALT F. WASSERBAU U. SCHIFFBAU VIA GMBH	1EG
J.M. VOITH GMBH	5
VOITH TURBO GMBH & CO.KG	6
VOLVO PENTA DEUTSCHLAND GMBH	6
VULKAN KUPPLUNGS-U. GETRIEBEBAU B. HACKFORTH GMBH & CO.KG	6

Company	Hall
VVPA LUISE BRANDMEIER WABCO WESTINGHOUSE STEUERUNGSTECHNIK GMBH & CO.	4
JEAN WALTERSCHEID GMBH WAMPFLER GMBH TECHN. BURO	20G
WAP-MASCHINEN GUIDO OBERDORFER	5
LUDWIG WEBER GMBH	2EG
	2EG

## CDI Marine Awarded \$2.9-Million Contract

CDI Marine Company was awarded a three-year \$2.9-million follow-on contract to provide repair, modernization, conversion, design and engineering services to the Supervisor of Shipbuilding, Jacksonville Naval Station, Mayport, Fla.

Company	Hall
SIS MEERES- UND UNWELT-MESSTECHNIK GMBH	1
SOURIAU-ELECTRIC GMBH	5
H.A. SPRINGER MARINE + INDUSTRIE SERVICE GMBH	8
SRS ING. BURO FUR FILTER-TECHNIK GMBH	
R. STAHL FORDERTECHNIK GMBH	7
C. WILH. STEIN SOHN OHG	5
NIKOLAI VON STEMPEL INDUSTRIE-VERTRETUNGEN OHG	3EG
STOP-CHOC SCHWINGUNGSTECHNIK GMBH & CO.KG	5
STORK PUMPEN GMBH	10EG
SVT BRANDSCHUTZ-U. SERVICE VERTRIEBSGES. MBH INTERNATIONAL	5
T-DRILL WERNER KONIG	6
F. TACKE KG KOMMANDITGESELLSCHAFT	6
DIESEL-ELEKTRIK FRIEDRICH TACKE GMBH & CO.	4
TANA TRADING GMBH	2EG
LOUIS TAXT GMBH & CO.	5
TECHNICAL CHANDLERS HAMBURG GMBH	4
TECHNISCHER APPARATEBAU JOACHIM ROLOFF	5
TECHNISCHES BURO JURGEN REESE	5
TECMO SCHIFFTS- U. HAFFEN-TECHNIK JURGEN MORTZ	3
TEDDINGTON CONTROLS GMBH	20G
TEMPELMANN FEINWERK-TECHNIK GMBH	6
K.J. TERFORT & CO.	10G
THYSSEN DRAHT AG	11EG
THYSSEN INDUSTRIE AG	7
HANS-JOACHIM TILSE GMBH	5, AN5
TRANSAMERICA INSTRUMENTS GMBH	5
WILHELM TRIPP GMBH	
TRITON-BELCO AG-SANITARE SCHIFFSEINRICHTUNGEN	5
TUBOFLEX K.G., FRITZ BERGHOFER & CO.	6
TURKAY GMBH	4
TURBO-TECHNIK REPARATURWERFT GMBH	4
UNID U. SCHREIBER	20G
UNISLTP GMBH	2
URACA PUMPENFABRIK URACH	10EG
VARTA BATTERIE AG	10G
VAT BAUSTOFFTECHNIK GMBH	
VDMA SCHIFFBAU UND OFFSHORE-ZULIEFERINDUSTRIE	
VECOM GMBH	2EG
VEGA GRIESHABER GMBH & CO.	5
VERBAND DER DEUTSCHEN SCHIFFBAUINDUSTRIE E.V.	7
VEREIN DER SCHIFFS-INGENIEURE ZU HAMBURG E.V.	11EG
VEREIN DEUTSCHE METALLWERKE AG VDM HALBZEUGE U. SYSTEMTECHNIK	2EG

# Only Westfalia's On-Demand Purifying System Removes All the Dirt and Water from your 1010 fuel.

Whether your fuel oil is heavier or lighter than water, only Westfalia's two-stage Unitrol/Secutrol system assures maximum purity even under widely varying feed conditions. Here's why.

### On-demand vs timer-controlled de-sludging.

Other oil purification systems are timer-controlled, which means they de-sludge only at pre-set intervals. If heavy seas stir-up the "muck" in your fuel tanks, the intervals may be too far apart. Result: dirt gets into your day tank and fuel lines, causing disastrous engine wear... In the Westfalia system, a unique sensor continuously monitors de-sludging intervals, discharging dirt and water only when the sediment-holding compartment is full. So there's no chance for dirt to get into your fuel because of too few de-sludgings — or fuel wastage from too-frequent de-sludgings.

And either stage can be operated independently, thus adding even more flexibility.

### No water in fuel lines.

With Westfalia's unique design, there's no way water can enter the clean fuel line. With other systems, this is a distinct possibility.

### Reliable purification.

No matter how wide the variations in density or feed characteristics, you get the most efficient, reliable purification. Automatically, with no need for gravity disc changes.

For maximum reliability we've substituted simplicity for complex electronics and intricate circuitry. Thus Westfalia purifiers are more dependable and much less likely to break down than other separators. Contact Centrico for the Westfalia system you need.

**Westfalia is proud to be part of the ongoing construction program of the new and growing U.S. Navy.**



Centrico, Inc., 100 Fairway Court, Northvale, NJ 07647 (201) 767-3900

Circle 230 on Reader Service Card

# PROPULSION UPDATE

## Detroit Diesel And Deere Plan Joint Venture To Market Broader Line Of Diesel Engines

General Motors and Deere & Company have signed a memorandum of understanding to form a joint venture to design, manufacture and distribute diesel engines worldwide, the companies announced recently. The proposed corporation would be held equally by both parent companies. The agreement is subject to final negotiations and clearance by the federal antitrust authorities.

The joint venture will include the diesel engine operations of Deere & Company and the Detroit Diesel Allison Division of General Motors (DDA).

F. James McDonald, president of General Motors, and Robert A. Hanson, chairman and chief executive officer, Deere & Company, issued this joint statement: "General Motors and Deere & Company believe this proposed joint venture is a very positive step for the diesel engine operations of both companies. The new organization will allow us to provide a full line of products that will benefit from combined resources in both technology and economies of scale in manufacturing. These advantages, coupled with a strong distribution network and the considerable experience of man-

agement and production personnel from both companies, give us confidence that the new company will play a leadership role in the diesel industry." Officials predict annual sales of about \$1.5 billion for the new company.

The new company is yet to be named and will be headquartered in the Detroit area. Senior management will be drawn from both GM and Deere. It is expected that the new firm will be in operation under its new name and management by January 1, 1987.

The joint venture will utilize diesel engine facilities in the Detroit area presently operated by Detroit Diesel Allison Division of General Motors. These include the Redford heavy-duty diesel engine plant, the Romulus Parts Distribution Center and the Romulus Engineering Center.

Also included will be the tools and machinery used to manufacture the Detroit Diesel 8.2L medium-duty engines now being built by GM's Chevrolet-Pontiac-GM of Canada (CPC) group which recently acquired DDA's Romulus diesel engine manufacturing facility. The 8.2L engine will be a part of the new joint venture's line.

The Deere & Company facilities to be utilized include the Waterloo, Iowa, diesel engine plant and a diesel engine plant in Saran, France. Engines will also be provided from the Dubuque, Iowa, factory, which will continue to be part of Deere & Company. These three facilities supply engines for John Deere agricultural and industrial equipment as well as for use by other customers in marine and industrial applications and generator sets.

All other DDA operations will remain with GM, and other operations of Deere & Company will be unaffected.

The combined product line gives the new company a complete range of diesel engines from 50 hp to 2,000 hp, with a wide variety of configurations to meet virtually every application need.

Detroit Diesel Allison has been marketing the John Deere line of diesel engines through its worldwide sales organization for the past year, under an earlier agreement. The two companies also have been cooperating under a technical agreement for joint engineering efforts on new products. These actions have provided continuity and direction while the joint venture has been under study.

For further information, including free color literature on the full line of diesels manufactured by Detroit Diesel Allison,

Circle 35 on Reader Service Card

For free copies of color literature offered by John Deere on their line of diesel engines,

Circle 36 on Reader Service Card

## MonArk Boat Delivers First of Nine Fast Parasail Craft For Air Force

The U.S. Air Force recently accepted a 41-foot Parasail Training Craft constructed by MonArk Boat Company of Monticello, Ark., following testing of the boat on Lake DeGray. The craft was loaded aboard a truck in Monticello for delivery to Homestead Air Force Base in Florida.

The first of nine Parasail boats to be constructed by MonArk under a \$2.2-million contract with the Naval Sea Systems Command, the new craft was approved after two days of tests conducted by the 3613th Combat Crew Training Squadron from Homestead. These boats will be used to replace an aging fleet of smaller, slower parasail craft being used at Air Force survival school,



Fast Parasail Training Craft built for Air Force by MonArk Boat is powered by twin 435-bhp Detroit Diesel engines providing speed of about 30 mph.

according to John Smith, MonArk's national sales manager. The craft was designed by Timothy Graul of Graul Marine Design, Sturgeon Bay, Wisc.

Subjects taught at the survival school include parachuting techniques, proper use of survival equipment, search and rescue procedures, medical and psychological aspects of water survival, subsistence, and hazardous marine life.

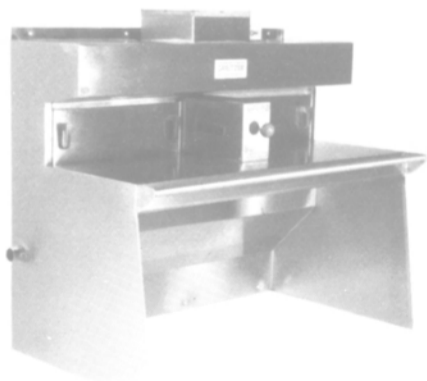
The new parasail craft will achieve a top speed of about 30 mph. Propulsion power is provided by twin 435-bhp Detroit Diesel 8V71 TI engines. Each boat is fitted (continued)

### PARASAIL TRAINING CRAFT Equipment List

Main engines (2)	Detroit Diesel
Gears	Allison
Propellers	Columbian Bronze
Steering	Teleflex
Shafting	Aquamet
Controls	Morse
Parasail winch	McElroy
Batteries	Delco
Battery charger	Newmar
Ship-to-shore	Newmar
Silencers	Reiley-Beaird
Lighting	Aqua Signal/ITT Jabsco
Loran C	Si-Tex
Depth recorder	Lowrance
VHF radio	ICOM
Sanitation	Mansfield
Seating	Wise
Windows	Wynn Enterprises
Bumper (fender)	Johnson Rubber
Coatings	Mobil

# GREITZER

## SHIPBOARD GALLEY EXHAUST VENTILATION A NEW SOLUTION TO AN OLD PROBLEM



- NAVSEA approval
- Effective Grease Extraction
- Reliable Fail-Safe Damper Control
- Automatic Internal Cleaning
- Complete Line of Models For Any Application

Distributed By: Rudman & Scofield, Inc.  
812 Middle Ground Blvd.  
Newport News, Va. 23606  
(804) 873-0510

GREITZER, Inc. • 101 Riverdale Road • Riverdale, N.J. 07457 • 201-839-8200

Circle 145 on Reader Service Card



## THE SUN NEVER SETS ON TEXACO'S DEDICATION TO INTERNATIONAL SHIPPING

Since its founding 80 years ago, Texaco has serviced the international marine community. It is our intention to remain in this business—a business of dedicated service and supply of quality marine lubricants and bunker fuel. Our worldwide network of people and facilities is well-known to our customers, and we can arrange supply most anywhere—in a matter of hours. Our lubricant analysis program helps recognize engine problems before they become critical. If you intend to “remain in the business” and if your company can benefit by the Texaco commitment, we await your call.

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



**Texaco Ltd.**  
International Marine  
Sales Dept.  
1 Knightsbridge Green  
London SW1X 7QJ  
Phone: 01 584-5000

**TEXACO  
WORLDWIDE**

Circle 276 on Reader Service Card

## Monark Delivers Fast Parasail Craft

(continued)

with a hydraulic winch and a tow reel that allows for the operation of parasailing equipment to simulate a bailout of aircrew members. The winch releases line, retrieves line, and locks it in place. After the student contacts the water, the vessel is used to recover and/or stand by the student and his equipment.

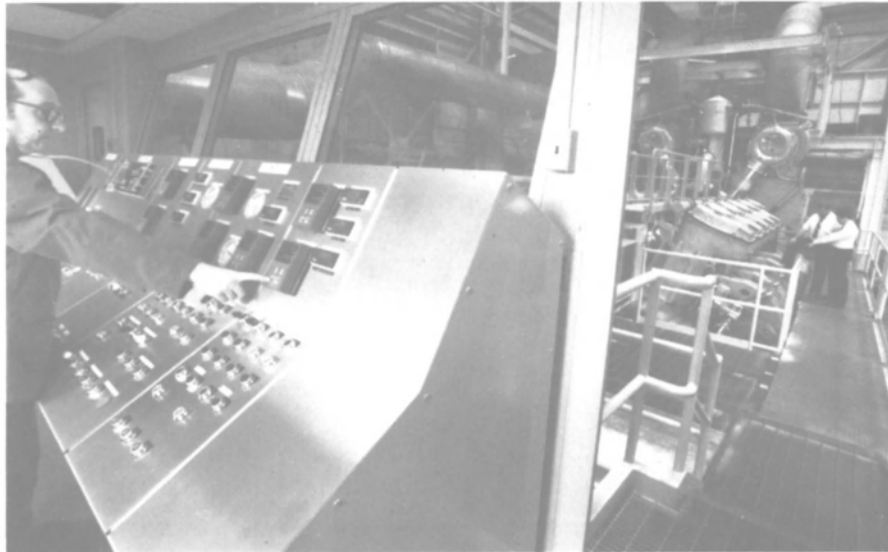
To provide overhead visibility by the boat's skipper and seaman, MonArk developed a cabin roof with transparent Lexan inserts. The overhead visibility insures that the student is in sight at all times during the exercise.

Outfitting includes a Loran C, VHF radio, safety railing, boarding ladder, automatic fire-extinguishing system, and depth sounder. A truck compartment is provided forward of the pilot station with full standing headroom, a full-length berth/seating, a navigation/chart table, and a navigational instruments storage cabinet.

Since the Water Survival School became fully operational in 1971, more than 70,000 students have graduated from its three-day course. Personnel trained at the school include active duty Air Force, Air National Guard, Reserve members, and NASA personnel, which include several groups of future astronauts, as well as selected personnel from the Army and Navy, and several allied countries.

For additional information and free literature on MonArk's facilities and activities,

Circle 11 on Reader Service Card



With this new test facility, Fairbanks Morse Engine Division offers to its customers complete and verifiable in-house testing of its large diesel engine product line.

## Fairbanks Morse Engine Division Unveils New Test Facility

The Fairbanks Morse Engine Division, Beloit, Wis., has announced the completion, testing and operation of its new large engine test facility. This new test facility offers complete engine operation testing for Colt-Pielstick PC4.2 series diesel engines on a state-of-the-art dynamometer system, with capabilities for testing marine or stationary engines from 4,500 to 29,300 bhp.

Mounted in an acoustically insulated, air-conditioned control room is the data-logging/recording and control equipment required for complete engine testing. The dynamometer is capable of loading in excess of 46,000 U.S. horsepower or

35,000 kilowatts. It is mounted on a special support base which provides air-bearing support while being aligned to the engine crankshaft. This system allows the 55-ton dynamometer to be pushed into position by two men.

When an engine is under test, control of test parameters is monitored by way of digital process controllers which regulate water and oil pressures, temperatures and dynamometer load.

Also provided by the system is automatic, instantaneous switch-over to "backup" lube oil and fuel oil pumps. The auxiliary equipment in this new facility includes a 7,000-

gallon-capacity operating lube oil pump which has a continuous recirculation filtering system, and pre-warms the oil prior to engine operation. This pre-warm system is also used for pre-lubrication of new engines, and is served by a separate 50-hp lube oil pump.

Two 300-hp variable speed pumps provide main engine lubrication circulation. Variable speed pumps were selected as they supply superior pressure and flow control over a wide range of engine requirements. Variable speed pumps were also selected for use on the engine's jacket water systems. The lube oil and jacket water systems both provide pressure-test capabilities as well as normal circulation functions.

Starting air supplied by a dedicated compressor is stored in two 100-cubic-foot air tanks at 650 psi. Also available are numerous alarms and automatic trips which can be programmed to suit special test situations.

With this new test facility, Fairbanks Morse Engine Division offers to its customers complete and verifiable in-house testing of its large diesel engine product line.

For additional information, including free literature,

Circle 29 on Reader Service Card

## Two Separate Divisions Formed From Textron's Bell Aerospace Operation

Textron Inc. has announced the creation of two separate divisions from its former Bell Aerospace Division. The Bell Aerospace operation in Buffalo, N.Y., is now one division, and the New Orleans operation is a separate division under the name Textron Marine Systems.

John J. Kelly, formerly Bell Aerospace president, will be president of the New Orleans-based Textron Marine Systems Division, which is in the air cushion vessel business, including the Landing Craft Air Cushion (LCAC) program for the U.S. Navy. He has been with Textron's aerospace operations for more than 20 years, with prior experience at Republic Aviation and General Electric.

Robert A. Norling, previously senior vice president of Bell Aerospace, is now president of that division, which includes operations in military electronics and propulsion systems and other high-technology products. He joined Bell Aerospace in 1980, following experience at Honeywell, the U.S. Army Ballistic Missile Defense Agency, Avco Everett Research, and Bendix Corporation.

B.F. Dolan, president and chief executive officer of Textron, said that this change "is intended to stimulate growth within each of the divisions by increasing management's focus on its individual markets." He added that each of the divisions should contribute significantly to Textron's results "just as Bell Aerospace has done historically."




- STRONG
- LIGHTWEIGHT
- MEETS O.S.H.A. STANDARDS
- DOZENS OF USES  
Scaffold Planks  
Beams  
Headers

Master Plank, an engineered wood product, is a continuous laminated veneer panel that can be cut into any required size for use as scaffold planks, beams and headers, etc. Available in standard widths. Master Plank, a wood laminate, provides strength properties superior to solid sawn wood. Warping, knotting and twisting are reduced, making the panel more consistently uniform.

For more information contact:  
**MC CAUSEY LUMBER CO.**  
 P.O. Box 38027-A • 7751 Lyndon Avenue  
 Detroit, MI 48238  
 Telex 23-0300 • Telephone (313) 861-2523

Circle 253 on Reader Service Card




**FRED DEVINE**  
 DIVING & SALVAGE, INC.

Marine Salvage • Harbor Clearance •  
 Wreck Removal • Pollution Control •  
 Diving Services • Ocean Engineering  
 • Fire Fighting • Tanker Lightering •  
 Ocean Outfalls • Flyaway Salvage  
 Crews • Anchor & Chain Recovery

**FRED DEVINE**  
 DIVING & SALVAGE, INC.

Write for full capability information and specifications on the SALVAGE CHIEF, the finest salvage ship afloat.

Headquarters  
 6211 N. Ensign, Portland, OR 97217  
 (503) 283-5285  
 Telex 36-0994 DEVINESALV



Quick, effective response to any marine casualty worldwide.

Circle 187 on Reader Service Card



## Eggert Appointed Sales & Operations Coordinator For Cleveland Tankers

David Eggert has been named sales and operations coordinator for Cleveland Tankers, Inc., according to a recent announcement by Robert B. Keifer, Ashland Petroleum Company vice president of marine/surface transportation and facilities.

Mr. Eggert's new responsibilities will include marketing petroleum transportation services, vessel scheduling, maintenance and repair, purchasing, and other operational activities. He reports to both Dave Ritchie, vice president of chartering, and Gerry Grammenos, assistant manager of fleet operations. Located in Cleveland, Mr. Eggert came to the company with many years of experience in the marine industry.

Cleveland Tankers operates a fleet of modern petroleum products carriers on the Great Lakes, and is a wholly owned subsidiary of Ashland Oil, Inc., the parent company of Ashland Petroleum Company.

## New Color Brochure From A.W. Chesterton Details Process Seals

A free color brochure is being offered by A.W. Chesterton Co. of Stoneham, Mass., on their new low-cost composite process seals for pumps.

The brochure, Bulletin 72420, describes the Chesterton composite seal 711 for pumps handling water or mild chemicals. Seal 711 Rotary has several advantages including: multiple non-clogging springs; O-ring balanced design; positive positioning; and no shaft sleeve wear. The units are constructed of metals and technical composite materials meeting exacting engineering requirements.

In addition, the color publication also details the Chesterton 712 and 713 composite glands, designed as inexpensive, off-the-shelf replacements for worn-out glands, or where pumps are changed from packing to seals and a new gland is required.

Configuration drawings, photographs and specification charts are included.

For your free copy of this color brochure from Chesterton,

Circle 48 on Reader Service Card

## Richfield Marine Agencies Merges As Subsidiary Of QAF Limited Of Brunei

Established in 1982 to provide shipping agency and other marine services to vessels calling at the Port of Singapore, Richfield Marine Agencies (Singapore) Pte. Ltd. has grown rapidly, and today is agent for more than 20 shipowners and operators all over the world, and the number of vessels husbanded by the firm continues to increase. Richfield is also active in slop trading and

Circle 150 on Reader Service Card >

drycargo brokerage. Its agent in the U.S. is Cobro International, Inc. of Houston.

The company recently merged and became a subsidiary of QAF Limited, which is owned and controlled by the Royal Family of the Brunei Government. QAF is a fast-growing and dynamic public company, whose shares are listed on the stock exchanges of Singapore and Malaysia.

The business activities of the

QAF Group include food processing, marine supplies, trading, advertising, and shipping. Richfield Marine will be the shipping arm of QAF in its future international shipping and marine-related business ventures, using Singapore as a base. Richfield is currently looking into all other shipping business opportunities that could be developed practically within the scope of the activities of the QAF Group and its relationship with the Brunei Govern-

ment.

In June this year, Richfield was officially appointed by the Government of the Republic of Vanuatu as its special agent for the Commissioner of Marine Affairs in handling and promoting the Vanuatu Shipping Registry and other maritime services.

For further information on the services offered by Richfield Marine Agencies,

Circle 42 on Reader Service Card



# Innovation is our strength

In cargo access, MacGregor-Navire's experience is unrivalled. We've equipped some 25,000 vessels – including 1,200 Ro-Ros and 100 sideloaders – and delivered forty linkspans.

By the continuing development of new technology,

MacGregor-Navire will remain world cargo access leader.

With StackCell – for safer carriage and quicker stowage of containers on deck. And with Auto Pallet Swinger – for faster, more efficient unitised loading.

Navies, too, can depend upon MacGregor-Navire for specialised new handling and access techniques. And harbours can benefit from MacGregor-Navire's tested oil spill recovery system.

Wherever the world's shipping industry is heading, MacGregor-Navire will provide access – and the servicing, at more than fifty centres worldwide.

MacGregor-Navire (USA) Inc,  
135 Dermody Street, Cranford, N.J. 07016, USA.  
Tel: (201) 272 8440. Telex: 4754036 MACNAV US  
(via ITT). Telefax: (201) 352 6048.

# MacGREGOR NAVIRE

## Stocker Succeeds Rice As President of Shipbuilders Council

**John J. Stocker**, formerly vice president of the Shipbuilders Council of America, has been elected president. He succeeds **M. Lee Rice**, who had been president since July 1983.

Mr. Stocker has been an officer

of the Council since August 1982. Prior to joining the SCA, he served in the Office of the Assistant Secretary of the Navy (Shipbuilding and Logistics). He also has held positions within the Navy Department, the Office of the Chief of Naval Operations, and the Congressional Research Office. He is a graduate of Duke University and pursued graduate studies at Cornell University.



Battleship Wisconsin (BB-64) as she appeared prior to mothballing at Philadelphia Navy Yard in 1958.

## OMNITHRUSTER® Thrust Is Forwards And Sideways And Backwards

465 USS POINT LOMA (AGDS-2) Provides Tracking, Telemetric, and Range Safety Support for Testing of Submarine-Launched Ballistic Missiles; also Deep-Diving Submersibles. OMNITHRUSTER SYSTEM: MARK II SERIES JTI100-TD 1000HP. Vertical Unit for Bow; Horizontal for Stern; with Thrust Directors and 2000A Controls

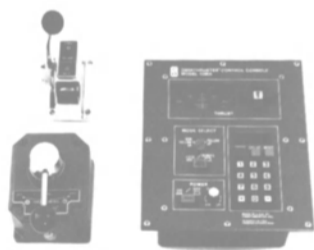


**360° Maneuvering,  
Slow-Speed Propulsion,  
Ice Management!**

- ◆ Thrusts Underway
- ◆ Thrusts While Pitching
- ◆ No Reversing Impeller to Change Directions
- ◆ Minimum Buoyancy Loss
- ◆ Smaller Hull Penetration
- ◆ Fuel Savings

### OMNITHRUSTER DOES IT ALL!

- ◆ Thrusts with nozzles out of water in rough seas: vertical systems only.
- ◆ No protrusions . . . no change in hull shape.
- ◆ Small nozzles reduce drag . . . save fuel and passage time.
- ◆ Easily retrofitted.



Micro Processor Control System, Model 1200A with gyro input . . . holds vessel's heading. System also accepts compatible NAV AIDS fore aft and slow-speed propulsion and positioning.

#### MODULAR THRUSTER SYSTEM . . .

OMNITHRUSTER ship control systems\* utilize individual module thrusters of up to 3000 HP in any combination to produce desired forward or lateral net thrust. Prime movers for the Modular Thruster System may be electric, hydraulic or diesel powered in conjunction with manual/automatic or integrated control networks.

#### ADVANTAGES FOR LARGE VESSELS . . .

- Incremental Thrust Capability
- Multiple Module Reliability
- Easily Retrofitted or Installed in New Construction
- Minimum Maintenance



PV JTI100, 1000HP  
MODULE THRUSTER

\*Covered by U.S. and Foreign Patents.

#### OMNITHRUSTER INC.

9515 Sorensen Avenue, Dept. 96  
Santa Fe Springs, California 90670  
213/802-1818 Telex 194265 OMNI SFES  
Cable Address Omnithrust

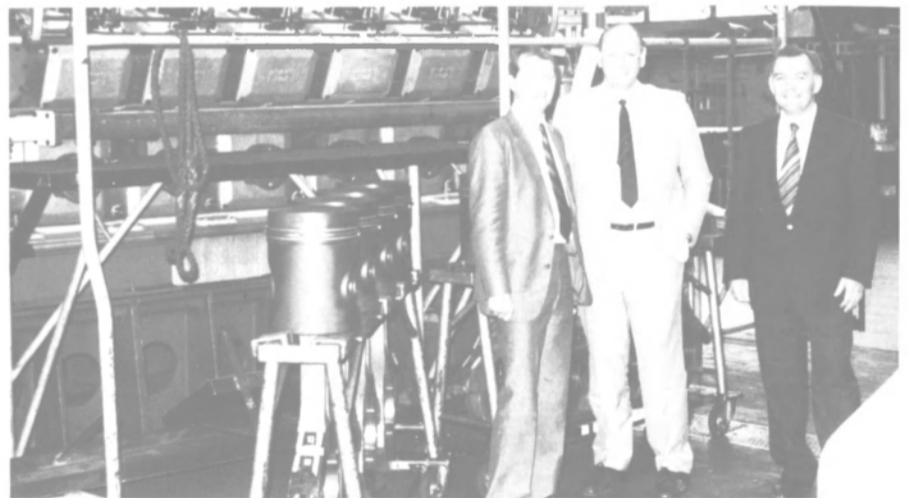
## Navy Awards Ingalls \$221.8 Million For Battleship Modernization

The U.S. Navy recently exercised a \$221.8-million contract option with Ingalls Shipbuilding division of Litton in Pascagoula, Miss., for the reactivation and modernization of the battleship Wisconsin (BB-64). The option is part of a contract awarded to the shipyard earlier, and is in addition to the \$1 million received at that time to beginning the planning work for the conversion.

The Wisconsin's reactivation, utilizing employees from the shipyard's existing work force, will combine overhaul of ship systems and equipment with installation of new

weaponry, electronics, and auxiliary systems. The contract will help stabilize employment levels at Ingalls; during peak periods the program will involve some 2,000 workers.

The ship was towed from Philadelphia to Avondale Shipyards near New Orleans in August. There she will undergo drydocking and work on the exterior hull and propulsion equipment under subcontract to Ingalls. She will be towed to Pascagoula near the end of this year for completion of the major portion of the reactivation by Ingalls. Redelivery to the fleet is scheduled for the latter part of 1988.



**CISERV NORFOLK TO REPRESENT ALPHA DIESEL ON U.S. EAST COAST:** Ciserv Norfolk, Inc., Norfolk, Va., a company specializing in diesel work onboard ships in port or at sea, has been appointed to represent Alpha Diesel of Frederikshavn, Denmark, on the U.S. East Coast. Alpha Diesel, a division of M.A.N.-B&W Diesel, AS, Copenhagen, has built marine engines since 1898, and is known for propulsion systems based on M.A.N.-B&W marine engine design. Ciserv Norfolk, Inc. is a subsidiary of Norfolk Shipbuilding and Drydock Corp. (Norshipco) and Ciserv, AB of Gothenburg, Sweden. The company is part of a worldwide network of diesel service stations. Pictured are, left to right: **Henrik Rosenberg**, vice president and general manager, Alpha Diesel; **Rolf Wallberg**, president, Ciserv Norfolk; and **Carl Erik Schmidt**, senior sales manager, Alpha Diesel. An Alpha Diesel propulsion system sits in the background. For free literature,

Circle 30 on Reader Service Card

Circle 18 on Reader Service Card

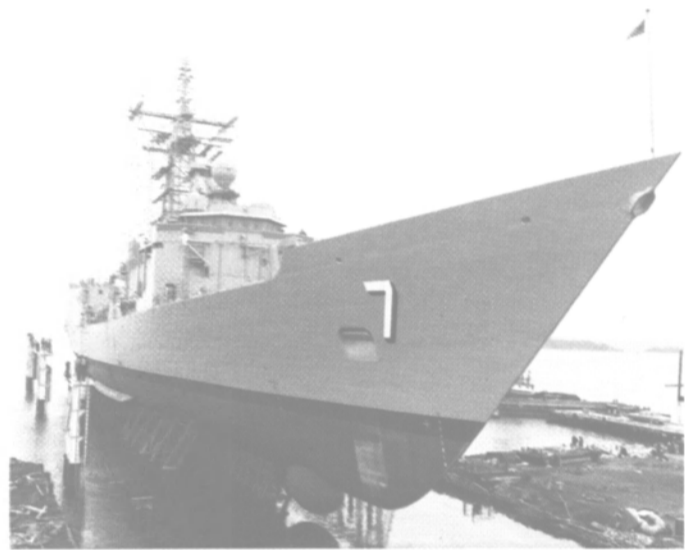


# randall

## PRACTICAL SOLUTIONS TO ALL DRY DOCKING PROBLEMS



BETHLEHEM STEEL CORP.  
SABINE RIVER YARD



ATLANTIC DRY DOCK CORP.  
JACKSONVILLE, FLORIDA



OSTEND, BELGIUM



VERSATILE PACIFIC SHIPYARDS  
VANCOUVER, B.C.

*Since 1854*

**CONSULTING SERVICES & DESIGN FOR:  
MARINE RAILWAYS, FLOATING DRY DOCKS & WATERFRONT STRUCTURES  
INSPECTION, DIVING SERVICES & DRY DOCK HARDWARE**



**CRANDALL DRY DOCK ENGINEERS, INC.**  
21 Pottery Lane, Dedham, Massachusetts 02026  
Telex 924406 (CRADOC DEDM) Telephone: (617) 329-3240  
Telecopier: 617-329-7957

## New Marine Repair Firm Established

Carl McBratney and Joseph Cangelosi have announced the formation of their new marine and industrial repair contracting firm. The company, known as Enterprise Marine And Industrial Repairs, Inc. was incorporated in late May, and is located in Port Newark, N.J., at

Tyler and Coastwise Streets. Enterprise Marine's phone number is (201) 589-2086.

Mr. Cangelosi and Mr. McBratney began their careers with Bethlehem Steel Corporation's New York operations and worked closely together at the former Hoboken shipyard of Bethlehem. Subsequent to the closing of the Bethlehem operation, Mr. Cangelosi served as manager of the Hoboken

operation upon its sale to Elliott Braswell's BSI Corp. Mr. McBratney was hull superintendent at First Marine on Staten Island.

The two are the sole owners of the company and intend to serve the marine industry in the area of pier-side and riding crew M & R needs. The industrial aspects of their operation will center on structural steel installation and job shop fabrications for contractors.

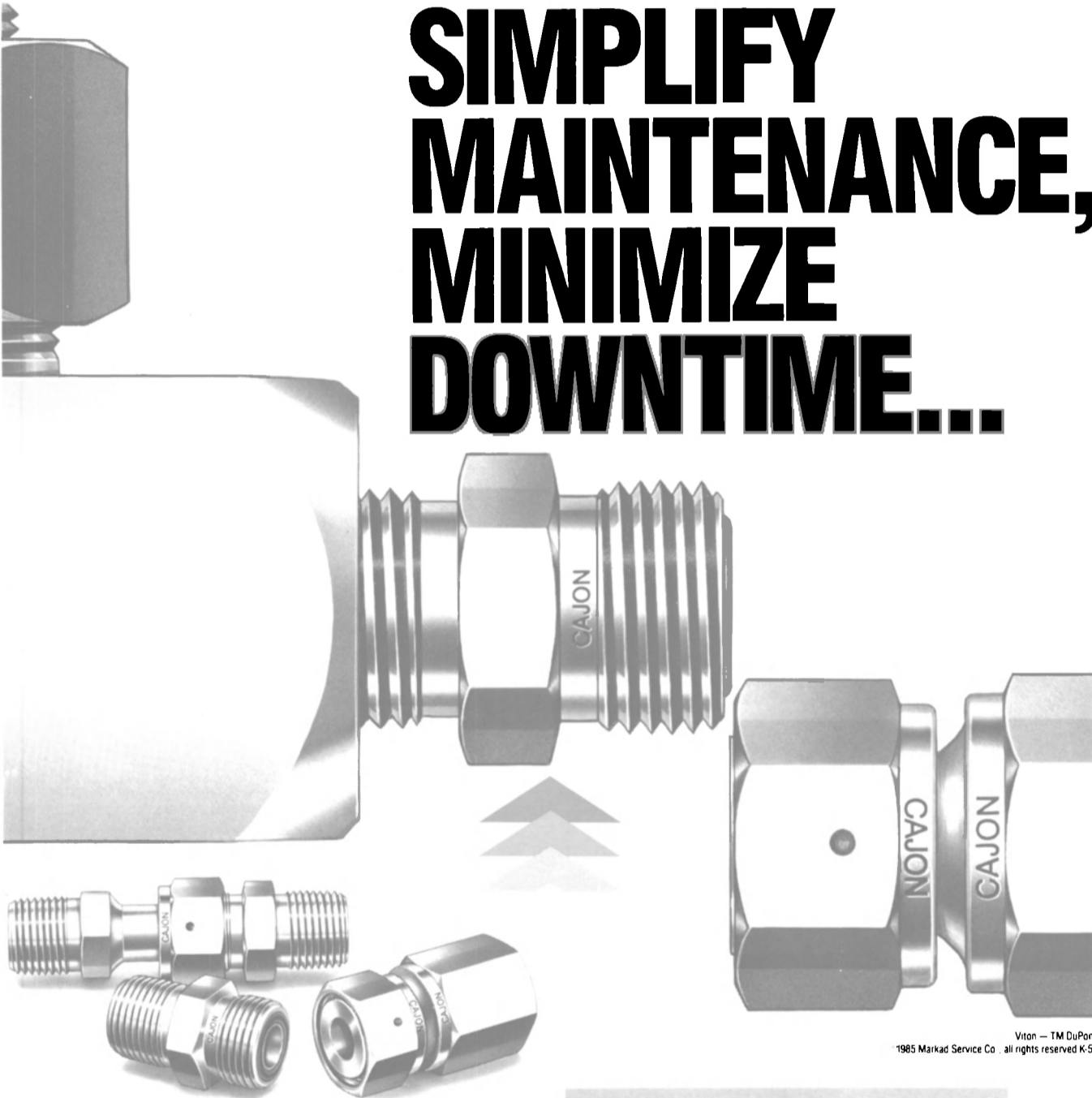
Enterprise Marine will provide competent, timely, and cost effective services to its clients.

Mr. Cangelosi's consulting firm Seacon will continue its operations in all areas not in conflict with Enterprise or its clients' interests.

For full information on the services offered by the new Enterprise Marine,

Circle 45 on Reader Service Card

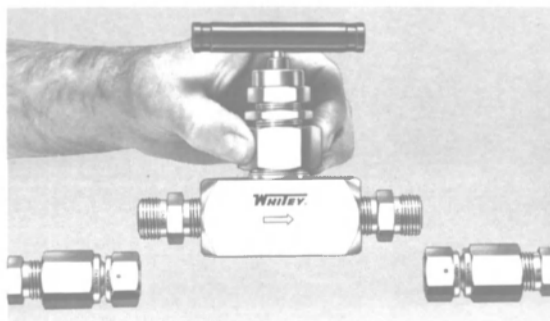
# SIMPLIFY MAINTENANCE, MINIMIZE DOWNTIME...



## Zero Clearance Face Seal Pipe Fittings allow EASY removal of system components

- Steel or 316 stainless steel construction
- Sizes from 1/4" to 1" with male and female NPT ends
- Service ratings to 6800 psi
- Temperature rating to 450°F
- Viton O-Ring seal standard, others available
- Test ports at seal provide positive leak testing
- Available immediately from your local Authorized Sales & Service Representative

Circle 167 on Reader Service Card



# CAJON

CAJON COMPANY  
9760 Shepard Road  
Macedonia, Ohio 44056



Viton — TM DuPont  
1985 Markad Service Co. all rights reserved K-51

## Magnavox Names Manager Of Marketing Services —Literature Available



Theresa Dale

Theresa Dale has joined the Magnavox Advanced Products Systems Company of Torrance, Calif., as marketing services manager. She assumes responsibility for all facets of marketing communications planning, budgeting and implementation, including advertising, public relations, sales promotion, distribution, direct mail, technical literature and trade shows, for the full Magnavox line of satellite communications and navigation products and systems worldwide.

Ms. Dale is an experienced marketing communications specialist with a wide background in marketing high-technology products. She was formerly account manager for GenRad, Inc., with responsibility for two automatic test equipment product lines, and has also served as account manager for Intel Corporation, and advertising and sales promotion specialist with Beckman Instruments, Inc.

For free literature on Magnavox Marine equipment,

Circle 88 on Reader Service Card

## U.S.M.S. Installs Three Hull Cleaning Stations

Underwater Ship Maintenance Service, Inc. has announced the installation of three underwater hull cleaning stations located in New Orleans, Miami-Ft. Lauderdale, Houston-Galveston ports.

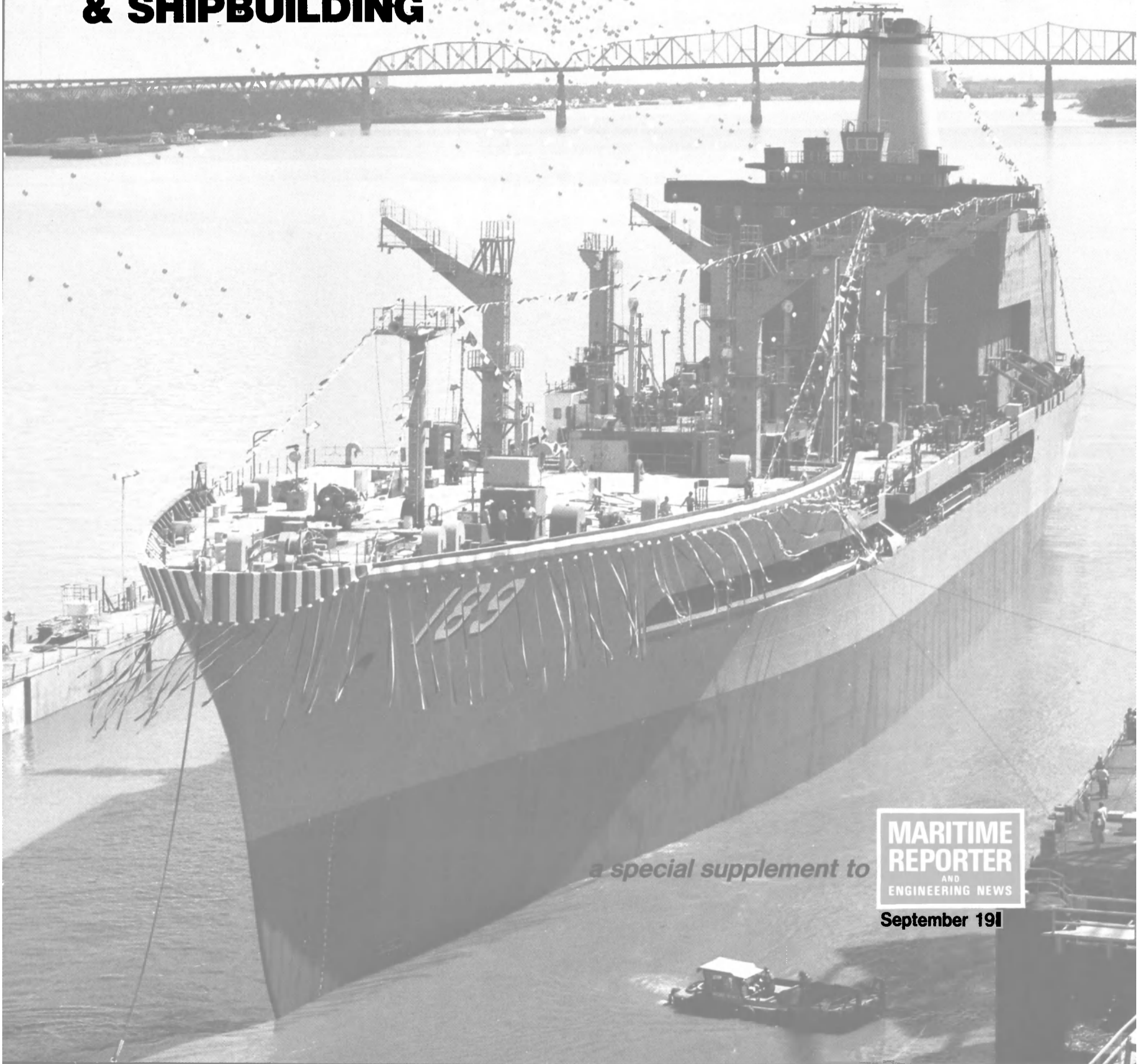
All three stations will be equipped with Trelleclean Underwater Hull Cleaning Systems. The Trelleclean System is nearly diver free with the capability to clean the vertical sides of a vessel automatically.

For a free brochure and more information about U.S.M.S. services,

Circle 10 on Reader Service Card

SPECIAL PULL-OUT  
SUPPLEMENT

# NAVAL TECHNOLOGY & SHIPBUILDING



*a special supplement to*

**MARITIME  
REPORTER**  
AND  
ENGINEERING NEWS

**September 1991**



"THE GREAT WHITE FLEET": 1907

GETTMAN ARCHIVES

# A CENTURY of LEADERSHIP. A TRADITION of EXCELLENCE.

**Newport News Shipbuilding**   
A Tenneco Company



"DOROTHY": LAUNCHED 1890



SEAL: LAUNCHED 1911



RANGER: LAUNCHED 1933



UNITED STATES: LAUNCHED 1951



"ENTERPRISE": LAUNCHED 1960



NIMITZ: LAUNCHED 1972



VIRGINIA: LAUNCHED 1974



"NEWPORT NEWS": LAUNCHED MARCH 15, 1986

Circle 250 on Reader Service Card



Battleship Wisconsin (BB64) nears Avondale Shipyards (Louisiana), to begin first phase of reactivation and modernization under contract from Ingalls Shipbuilding, which will complete the second phase of the \$221.8 million project in its Pascagoula, Mississippi yard. (Ingalls Shipbuilding photo.)

# U.S. NAVY SHIP PROCUREMENT

Latest Update As Of August 13, 1986

By James R. McCaul, President  
International Maritime Associates, Inc.

International Maritime Associates, Inc. publishes quarterly reviews of the Navy ship procurement market. This article is an excerpt from the August quarterly review. Information in this article is current as of August 13.

## SHIPBUILDING AND CONVERSION

Exhibit 1 shows the authorization status of the FY 1987 shipbuilding and conversion program now being

considered by Congress. Figures for FY 1986 and the projection for FY 1988 are provided for comparison purposes. Data for the Senate are final numbers. The House data are based on the House Armed Services Committee recommendations. A House/Senate conference is scheduled for September to iron out differences between the two bills. Appropriation legislation is needed to actually fund the programs.

Significant changes in the program recommended by House and Senate authorizers are described below.

**Fast combat ship (AOE)**—Citing budget constraints and program priorities, the Senate has deleted the AOE proposed in FY 1987. Senator **Specter** (R-Pa.) had planned to introduce an amendment in floor debate which would reverse the committee recommendation and authorize the AOE pro-

gram. The amendment was not introduced on the grounds the AOE would be taken up in House/Senate conference. Authorization of this program is recommended by the House committee.

As reported in the previous update, contract design for the AOE was completed last February. Bids are due in October. A contract for four ships (one firm plus three options) has been planned. Program approval is uncertain and a decision must await final outcome of the authorization and appropriation process. Meanwhile, five or six shipyards are preparing proposals.

**Minesweeper hunter (MSH)**—Problems in the MSH program (including shock test failures) resulted in both House and Senate actions to delete proposed FY 1987 funding for these ships.

(continued)

**EDITORS NOTE:** This Article is not the full quarterly report. It is an excerpt and represents less than 25 percent of the actual data contained in the complete review.

### HOW TO ORDER THE COMPLETE REVIEW

Every three months International Maritime Associates, Inc. publishes a detailed review of the U.S. Navy ship procurement market. These quarterly reviews (30+ pages) provide a totally objective assessment of current and prospective Navy business. Both shipbuilding and ship systems/ordnance procurement are addressed. Each review contains a hard hitting assessment of specific programs, lists all major contracts awarded by the Navy, identifies future market opportunities and provides a current directory of key Navy contacts.

More than 220 companies now subscribe to IMA's quarterly market review. The price of a one year subscription is \$380. The market review can be ordered by contacting International Maritime Associates, Inc., 3050 K Street N.W., Suite 345, Washington, D.C. 20007, (202) 333-8501



**Exhibit 1—Navy Ship Procurement Market Report**  
**Funding Status of Navy FY 1987 Shipbuilding Program**  
 (\$ in millions)

	FY 1986		FY 1987				FY 1988			
	No. Ships	\$	Request No. Ships	Senate No. Ships	House No. Ships	\$	No. Ships	\$		
<b>New Construction</b>										
Trident Submarine (SSBN)	1	1,309.4	1	1,509.1	1	1,509.1	—	1	1,516.5	
Attack Submarine (SSN-688)	4	2,540.9	4	2,332.6	4	2,332.6	4	2,046.9	3	2,046.9
New Design Submarine (SSN-21)	—	—	—	454.3	—	454.3	—	454.3	—	160.2
Aegis Cruiser (CG-47)	3	2,612.3	2	1,924.3	2	1,924.3	3	2,725.6	2	1,902.6
Aegis Destroyer (DDG-51)	—	74.0	3	2,527.8	3	2,545.8	1	951.5	3	2,354.6
Mine Countermeasures Ship (MCM)	2	197.2	—	—	—	—	—	—	3	272.2
Coastal Minehunter (MSH-1)	4	184.5	4	196.1	—*	(see text)	—	—	4	181.8
Amphib. Landing Ship Dock (LSD-41)	2	373.4	—	—	—	—	—	—	—	—
Amphib. Landing Ship Dock (LSD-41/CV)	—	—	—	—	—	—	—	—	1	311.2
Amphib. Assault Ship (LHD-1)	1	1,268.3	—	232.0	—	232.0	—	232.0	1	1,046.9
Ocean Surveillance Ship (TAGOS)	2	115.1	3	148.1	3	148.1	2	98.3	3	193.9
Fleet Oiler (TAO)	2	266.3	2	275.5	2	275.5	2	275.5	2	319.9
Ammunition Ship (AE)	—	—	—	—	—	—	—	—	1	369.8
Landing Craft Air Cushion (LCAC)	12	307.0	—	—	—	—	—	—	9	221.3
Survey Ship (TAGS)	—	—	—	—	—	—	—	—	—	—
Fast Combat Support Ship (AOE)	—	—	1	612.7	—	—	1	612.7	—	—
Oceanographic Research Ship (AGX)	—	—	1	33.0	1	33.0	1	33.0	—	—
<b>Conversion/Modernization</b>										
Fleet Oiler Lengthening (AO 177)	—	—	1	62.3	1	62.3	—	—	1	49.5
Acoustic Research Vessel (AG)	1	57.0	—	—	—	—	—	—	—	—
Amphib. Transport Modernization (LPD-4)	—	—	—	23.1	—	—	—	—	—	97.8
Battleship Reactivation	1	469.0	—	—	—	—	—	—	—	—
Carrier Modernization (CV SLEP)	—	52.0	—	83.5	—	83.5	—	83.5	1	544.8
Moored Training Ship Demo. (MTSD)	1	175.4	—	—	—	—	—	—	—	—
Aviation Support Ship (TAVB)	1	26.9	—	—	—	—	—	—	—	—
Strategic Sealift	—	228.4	—	27.8	—	27.8	—	27.8	—	50.4
Strategic Sealift Enhancement	—	—	—	20.7	—	20.7	—	20.7	—	18.4
Crane Ship Conversion (TACS)	3	82.5	2	61.1	2	61.1	2	61.1	2	59.9
<b>All Other Costs</b>										
Adjustments	—	500.8	—	522.2	—	532.2	—	522.2	—	577.3
FY 86 MSH Reprogramming	—	—	—	—	—	—	—	(75.5)	—	—
Other	—	—	—	—	—	(327.7)	—	—	—	—
<b>Total Budget</b>										
		<b>10,840.4</b>		<b>11,046.2</b>		<b>9,914.6</b>		<b>8,355.3</b>		<b>12,295.9</b>
<b>Number of Ships: (excl. LCAC)</b>										
New construction	21		21		16		14		24	
Conversion/Modernization	7		3		3		2		4	

Source: House and Senate Defense Authorization Bills

**Exhibit 2—Navy Ship Procurement Market Report**  
**Funding Status of FY 1987 Navy Weapons Procurement Program**  
 (\$ in millions)

	FY 1986		FY 1987				FY 1988			
	Qty	\$	Request Qty	Senate Qty	House Qty	\$	Qty	\$		
<b>Missiles</b>										
Trident II	—	550.9	21	1,424.4	21	1,424.4	21	1,424.4	66	2,283.7
Tomahawk	249	724.8	324	790.5	324	735.5	324	712.3	410	908.2
Phoenix	265	348.8	205	317.7	205	317.7	300	303.9	430	440.9
Sparrow	13,948	340.7	1,716	279.4	1,716	279.4	1,716	259.1	1,594	271.6
Sidewinder	2,120	107.0	627	64.6	627	64.6	627	47.0	488	52.2
Harpoon	370	286.3	94	139.9	110	139.9	94	128.4	204	197.1
HARM	825	224.4	1,110	256.7	1,110	256.7	1,110	256.7	1,492	336.6
Standard Missiles	1,316	857.9	1,194	730.6	1,194	730.6	1,194	730.6	1,250	747.3
Stinger	—	—	685	51.9	685	51.9	685	39.7	—	—
Mavericks	1,695	191.4	2,219	250.8	2,219	250.8	1,995	223.1	1,502	163.3
Other Missiles	1,504	78.2	306	86.1	256	22.9	256	22.9	2,217	196.1
<b>Torpedoes</b>										
MK-48 ADCAP Torpedo	123	395.9	227	508.4	227	508.4	227	468.2	296	552.6
MK-46 Torpedo	500	118.9	500	97.9	500	97.9	500	97.9	500	87.7
ALWT	—	—	84	109.9	84	109.9	67	94.9	204	346.9
MK-60 Captor	150	56.6	—	—	—	—	130	59.5	—	—
Vertical Launch ASROC	—	—	200	74.3	200	74.3	200	74.3	300	73.5
ASUW Torpedo	—	—	34	17.0	34	17.0	—	—	110	30.9
<b>Other</b>										
FLTSATCOM	—	53.1	—	65.1	—	62.1	—	65.1	1	118.3
MK15 CIWS (Phalanx)	39	139.3	27	105.6	27	105.6	27	105.6	9	43.1
Spares & Repair Parts	—	151.5	—	150.7	—	150.7	—	150.7	—	162.1
Other	—	590.4	—	573.9	—	505.6	—	461.5	—	861.5
<b>Total</b>										
		<b>5,216.1</b>		<b>6,095.4</b>		<b>5,905.9</b>		<b>5,725.8</b>		<b>7,873.5</b>

Source: House and Senate Defense Authorization Bills

The Senate authorized the Navy to buy two existing minesweeper hunter ships (one complete ship and one partially outfitted hull) from a shipbuilder in an allied country. This authorization was made subject to the following provision:

Funds may not be obligated or expended for the procurement of a lead minesweeper hunter ship or a partially outfitted hull of a minesweeper hunter ship from a foreign country until the Secretary of the Navy has certified to the Congress in writing (A) that purchase of up to two foreign-built ships responds to an urgent national security requirement; (B) that no United States shipbuilder has demonstrated the capability, or that no shipbuilder can demonstrate the ability to acquire that capability to meet that requirement in a timely fashion.

In explaining its action the Senate committee stated:

Rather than design a wholly new ship, with all the delay and risk that course would entail, the committee recommends the Secretary of the Navy be authorized to use up to \$100 million in unobligated prior year funds from the MSH program to acquire a European design capable of meeting our MSH mission. This initiative would add near term minehunting capability to our fleet at a well defined cost and low risk.

The committee expects that follow-on ships of whatever design the Secretary selects will be built in quantity in the United States. To this end, the committee has recommended bill language authorizing use of prior year funds to acquire a lead ship or parts thereof for completion in the United States. One additional partially outfitted hull may also be procured to facilitate transfer of the manufacturing technology to U.S. shipbuilders.

The committee recognizes the customary prohibition on funding the construction of ships abroad and grants a one time exception for the lead ship and one partial follow hull so that a rapid build up of MSH force levels can be achieved.

Similar language had been drafted by the House committee prior to full committee mark-up. Efforts by Congressman Davis (R-Miss.) succeeded in deleting this language. Instead, the House committee recommends that the Navy convene a NATO study group to assess "ways in which NATO nations can act together to combat the mine warfare threat."

The issue of buying existing MSH ships from foreign yards will be taken up in House/Senate conference. Meanwhile the MSH—which hardly seems like the most complex ship

(continued)



# A RUSTY BOLT CAN DRIVE YOU NUTS.

It can also cost you time, unnecessary repairs and worn parts.

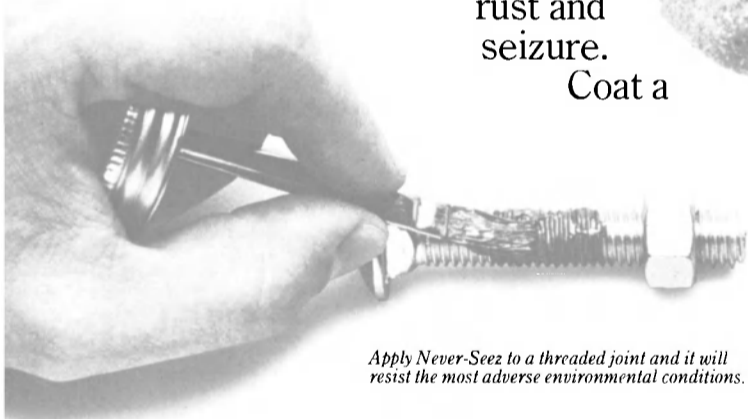
And bring your toughest machinery to a grinding halt.

To protect the state of your industrial equipment, not to mention your state of mind, there's Bostik.

We make Never-Seez.

A complete line of anti-seize lubricating compounds that prevents galling, fretting, rust and seizure.

Coat a



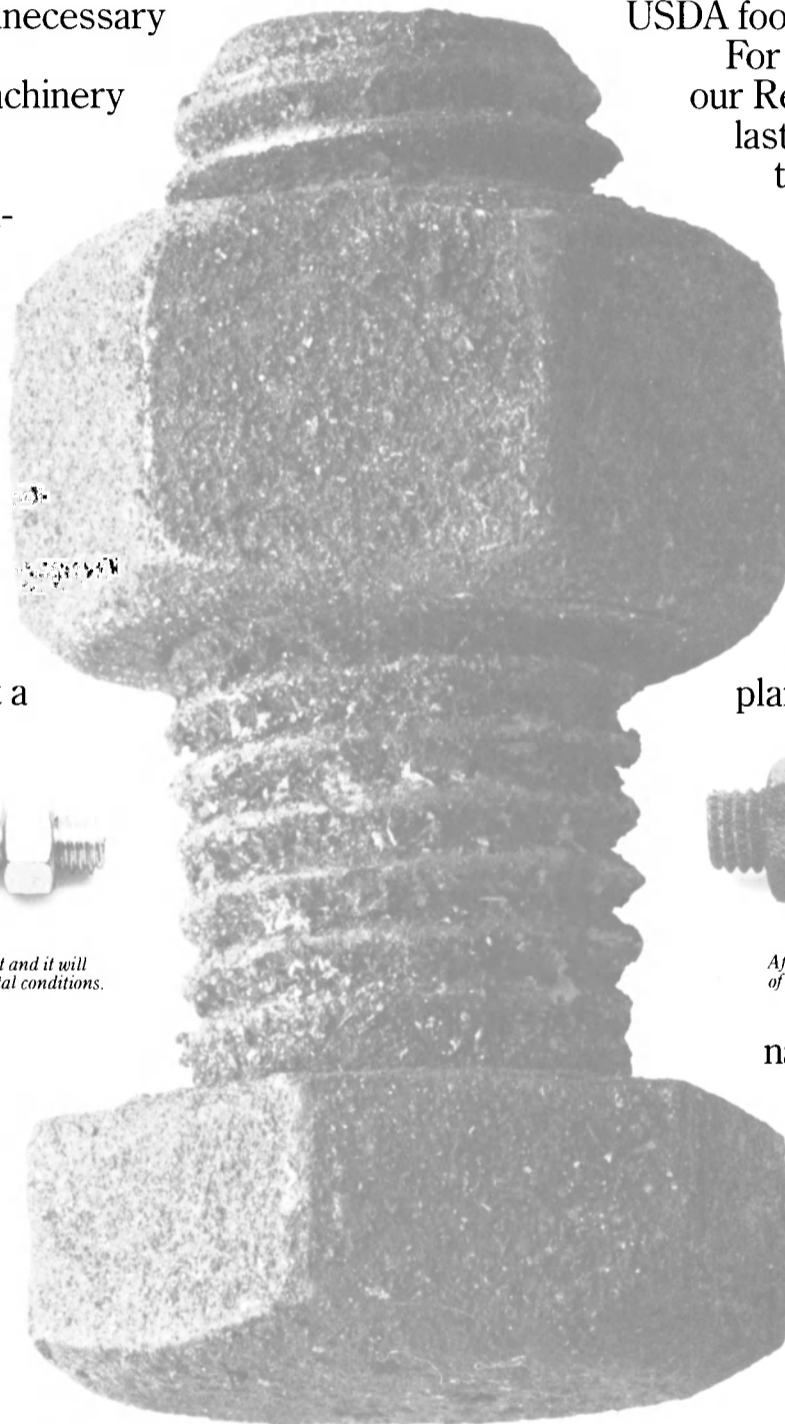
Apply Never-Seez to a threaded joint and it will resist the most adverse environmental conditions.

threaded part or joint with Never-Seez and it can withstand virtually any punishment. No matter how severe.

Expose it to abrasion, salt water, corrosive chemicals. Submit it to extreme temperatures or pressures. Never-Seez will never harden, separate or evaporate.

Performance like this explains why Never-Seez is the industry standard. But there are other reasons, too. Six of which happen to be the various formulas Never-Seez comes in.

In addition to our Regular grade, we make White Food formula that complies with FDA/



USDA food requirements.

For smooth operation of bearings, our Red Bearing, polyurea lubricant lasts 70 percent longer than soap thickened greases.

To break in equipment or protect press fit assembly, our Black Moly concentration of molybdenum disulfide resists pressures as severe as 500,000 pounds per square inch.

And when applications prohibit copper, or demand certification of purity, we make two nickel grade formulas, including one for nuclear power plants that tests free of contami-



After being submerged in salt water for 12 months, portions of bolts covered with Never-Seez remained free of corrosion.

nation from sulfur, halogens and low-melt metals.

All of this should suggest that Never-Seez has literally thousands of applications. Whether you're protecting shafts, hubs, conveyor systems, valves, gear boxes or roller pins.

For detailed information on all our lubricating products, write Bostik, Middleton, MA 01949. Or call (617) 777-0100.

## NEVER-SEEZ



**Bostik**  
EMHART



(continued)

the Navy is acquiring—has been put on ice.

**Aegis ships (CG-47 and DDG-51)**—The Senate authorized the three DDGs and two CGs re-

quested by the Navy. The House committee recommended two DDGs and three CGs—citing the need to “foster and maintain the existing competitive situation (Ingalls vs. Bath) and allow the earlier completion of the Navy’s 27-cruiser pro-

gram.” An earlier subcommittee recommendation to provide only one DDG in the FY 1987 program was changed in full committee review. An amendment adopted in House floor action removed the second Aegis destroyer from the House

authorization bill. Representative **Spratt** (D-S.C.) offered this amendment so as to cut obligational authority by \$799 million.

As matters now stand the Senate has authorized two CGs and three DDGs as requested by the President. The House bill will provide authorization for three CGs and one DDG. Differences will be worked out in conference.

The Senate also authorized additional funds (\$10 million for design, \$18 million for procurement) to provide helicopter support facilities aboard subsequent DDG-51 ships. This would include the RAST landing system (made by DAF-Indal in Canada) and facilities to arm and refuel helicopters.

**Trident submarine**—The House committee recommended not authorizing the Trident submarine proposed for FY 1987 funding. It cites budget constraints, pressures on arms control negotiations and lack of competition in Trident procurement. The Senate has authorized approval of this program for FY 1987. This will be taken up in conference—with approval likely.

**Fleet oiler (AO-177) lengthening**—Citing cost effectiveness issues, the House committee recommends not proceeding with proposed lengthening of five AO-177 fleet oilers. According to the committee “adding capacity with additional TAO-187 ships would appear to be a less expensive alternative.” Additionally, “the at-sea replenishment capabilities of the variant configuration would be greatly hindered by the speed limitations of the AO-177.” The Senate has approved this program.

**Exhibit 3—Navy Ship Procurement Market Report  
Funding Status of FY 1987 Navy  
Other Procurement Program  
(millions of \$)**

	FY 1986	FY 1987			FY 1988
		Request	Senate	House	
Ships Support Equipment	\$ 907.5	\$1,054.4	\$1,054.3	\$ 990.4	\$1,159.0
Commun. & Elect. Equipment	2,016.1	2,031.4	2,031.4	1,910.7	2,529.9
Aviation Support Equipment	1,141.4	963.5	963.5	735.8	1,143.6
Ordnance Support Equipment	1,241.5	1,259.8	1,259.8	1,169.1	1,463.1
Civil Engin. Supp. Equipment	229.4	267.3	267.3	185.7	277.5
Supply Support Equipment	58.9	82.2	82.2	71.8	138.2
Personnel & Command Supp. Equip.	526.5	556.3	556.3	482.1	634.7
Spares and Repair Parts	260.0	323.9	323.9	302.4	409.4
Adjustments	—	—	(417.1)	(74.9)	—
<b>Total</b>	<b>\$6,381.3</b>	<b>\$6,538.8</b>	<b>\$6,121.7</b>	<b>\$5,773.1</b>	<b>\$7,755.4</b>

Source: House and Senate Defense Authorization Bills

**Exhibit 4—Navy Ship Procurement Market Report  
Funding Status of FY 1987 Navy Research, Development  
Test and Evaluation Budget  
(millions of \$)**

	FY 1986	FY 1987			FY 1988
		Request	Senate	House	
Technology Base	\$ 835.6	\$ 851.0	\$ 851.0	\$ 786.3	\$ 918.0
Advanced Technology Development	118.8	196.3	188.8	172.2	294.4
Strategic Programs	2,386.0	2,001.0	1,998.3	1,779.2	1,576.9
Tactical Programs	5,375.2	6,035.1	5,929.9	4,632.4	6,191.4
Intelligence and Communications	580.5	695.0	642.0	673.3	765.5
Defense Wide Mission Support	780.8	808.4	808.4	722.6	857.4
Other	—	—	—	331.1	—
Adjustments	—	—	(927.4)	(456.1)	—
<b>Total</b>	<b>\$10,076.9</b>	<b>\$10,586.8</b>	<b>\$9,491.0</b>	<b>\$8,641.0</b>	<b>\$10,603.6</b>

Source: House and Senate Defense Authorization Bills

## ENTERPRISE MARINE AND INDUSTRIAL REPAIRS INC.

Bringing shipyard experience to your doorstep. Specializing in...

- Voyage & Casualty Repairs
- M & R Pierside/AT SEA
- Special marine projects
- Industrial & Marine Fabrications

Count on us for quick, reliable response to your needs.

Contact: Joseph Cangelosi or Carl McBratney at Enterprise Marine, Tyler and Coastwise Streets, Port Newark, New Jersey 07114, (201) 589-2086, Telex: 219744 Code 107

Circle 114 on Reader Service Card

## SURVIVAL SUITS by SURVIVAL INTERNATIONAL, INC.



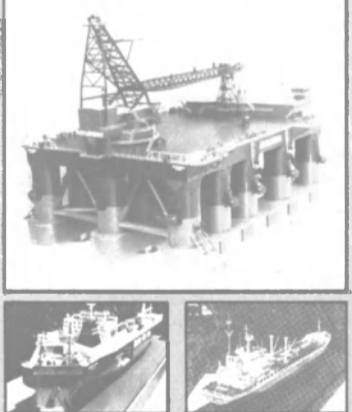
- THE INDUSTRY LEADER
- BEST DESIGNED
  - HIGHEST QUALITY
  - LOWEST COSTS

Write Today For Information  
Survival International  
7859 S. 180 St. Kent, WA 98032  
(206) 251-8880

Circle 137 on Reader Service Card

## MUSEUM MODELS

WITH 20 YEARS OF EXPERIENCE AND TECHNOLOGY, WE'VE BUILT AN WORLDWIDE REPUTATION AS LEADING MAKERS OF ALL KINDS OF SHIPS AND OFFSHORE STRUCTURE MODELS.



ORIENTAL INDUSTRY CO.  
408-29, SOKYO-DONG, MAPO-KU  
SEOUL, KOREA  
TELEX: OTLRIFE K22396  
TEL: 323-3654, 9862

Circle 259 on Reader Service Card

**Ocean surveillance ship (TAGOS)**—The House committee recommends deleting one TAGOS from the FY 1987 program. Budget constraints are given as the reason for this recommended cut. The Senate has approved the three ships requested.

## WEAPONS PROCUREMENT

The Navy requested \$6.1 billion to buy missiles, torpedoes, mines and other weapons in FY 1987. The House Committee recommended programs totaling \$5.9 billion—and an additional \$138 million was added by floor amendment. A \$5.6-billion program is authorized by the Senate. Details are shown in Exhibit 2.

**Rolling airframe missile (RAM)**—Both House and Senate committees recommend not authorizing RAM procurement or further development efforts in FY 1987. The U.S./German program is behind schedule, over cost and said to be "plagued by continuing reliability and quality assurance problems." Reversing the committee recommendation in floor action, the Senate authorized proceeding with the RAM program subject to:

- the expectation that Navy would spend up to \$24.2 million in RDT&E funds and \$40 million in procurement funds for RAM in FY 1987;

- the funds must be obtained by taking from other authorized programs

GD-Pomona is the prime contractor for RAM. EG&G, Bermite-Whittaker, Hercules, and Morton Thiokol are also involved in this program.

**Other missiles**—The House committee recommends deleting 224 IIR Maverick missiles and adding 95 Phoenix missiles to the budget request. Hughes-Tucson manufactures both of these missiles.

**MK-48 advanced capability (ADCAP) torpedo**—Citing delays in testing the House committee recommended cutting FY 1987 ADCAP procurement from 227 to 50 torpedoes. An amendment introduced by Congressman **Spratt** (D-SC) added \$253 million back into the MK-48 procurement program. Hughes-Fullerton is the prime contractor for the ADCAP torpedo.

**Anti-surface warfare (ASUW) torpedo**—Stating that the projected inventory of MK-48 and MK-48 (ADCAP) will double the current inventory of heavy-weight torpedoes, the House committee recommends disapproval of the proposed ASUW torpedo program in FY 1987.

**MK-50 advanced lightweight torpedo**—The House committee recommends cutting FY 1987 procurement from 84 to 67 MK-50 torpedoes. It cites budget pressures and the desirability of maintaining production over an extended period as the reason for the reduction. Honeywell-Minneapolis is the prime contractor for this program.

**MK-60 Captor mine**—Last year, the House added 150 Captor

mines to the Navy's procurement request. Continuing this directive the House committee recommends \$60 million for 130 mines in FY 1987. The Navy has not requested this procurement. Citing the role of Congressman **Hartnett** of South Carolina, the House committee directs that the Captor mine be renamed the Hartnett mine by the

Navy. Goodyear Aerospace in Akron, Ohio is prime contractor for the program.

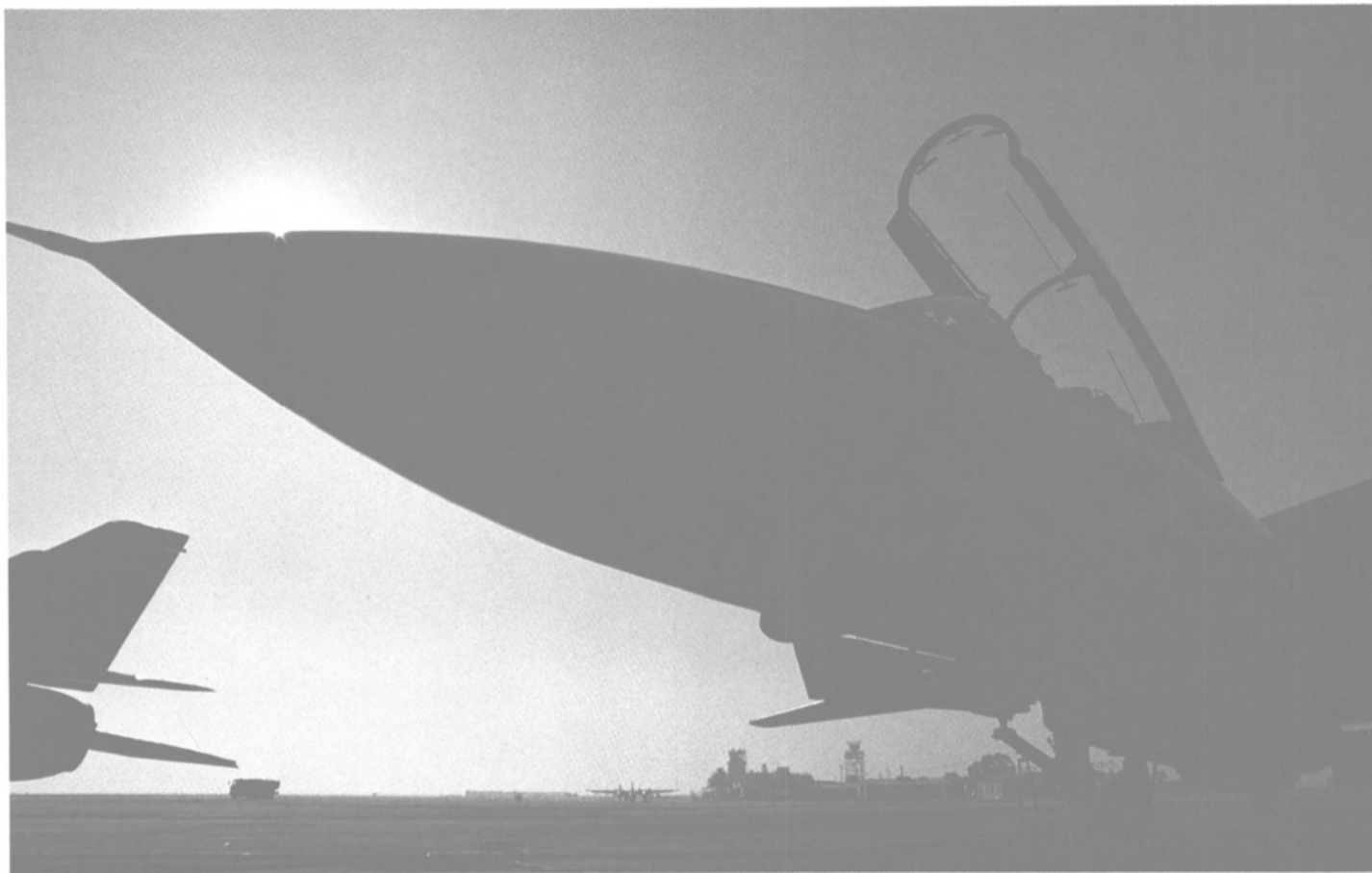
## ELECTRONICS AND SUPPORT EQUIPMENT

The Navy requested \$6.5 billion

for other procurement programs in FY 1987. The House committee recommends \$5.8 billion and the Senate has authorized \$6.1 billion. Details are given in Exhibit 3.

**MK-45 gun mount**—The Senate committee recommended against authorizing a multiyear pro-

(continued)



# They carry the most advanced weapons against corrosion.



Military aircraft and ships arm themselves against corrosion with PRC sealants and coatings.

Based on proprietary PRC Permapol® Polymers, PRC sealants and coatings are elastomeric, providing the flexibility to "give" with movement caused by thermal shock, vibration, and other environmental factors.

Where other materials become brittle and crack over time, PRC products maintain their elasticity. In addition to having a high degree of chemical resistance, PRC coatings are also abrasion and impact resistant. PRC coatings conform to the rigorous standards outlined by the EPA under VOC regulations. The end result: long-term protection.

PRC Proreco® Decking Systems have a 15 year service history of providing deck maintenance cost savings on all types of high wear deck surfaces including aircraft carrier flight decks, helicopter landing platforms on military ships and on offshore drilling rigs, cruise ships, cable laying ships, ice breakers, fishing vessels and ocean going towboats of all types.

Contact R.N. Morris, Market Manager  
Products Research & Chemical Corporation,  
P.O. Box 1800, Glendale, CA 91209. (800) 423-2411.  
In California: (818) 240-2060.



## Proreco® Deck Coating Systems



(continued)

curement contract for MK-45 gun mounts and MK-6 ammo hoists. FMC-Northern Ordnance is involved in this program. Reason given for the recommendation is the savings in long term program costs are "not worth the near term cost in additional outlays."

**Seasheds**—The House committee recommends that 350 seasheds be purchased in FY 1987. The Navy's proposal is to buy 100 seasheds. Two firms qualifying as small businesses have been receiving contracts to supply seasheds to the Navy. The Senate committee expressed concern that the Navy acquisition rates have been unpredictable—adversely affecting these small contractors.

**AN/SQR-17A acoustic processor**—The Navy had requested funding to procure eight units in FY 1987. The House committee recommends an increase to 20 units. Reason given is more efficient produc-

tion and quicker delivery which would result.

**AN/BLD-I microwave intercept receivers**—The House committee recommends adding procurement of eight AN/BLD-I units in FY 1987. Navy had not requested this procurement. Reason given for the recommendation is to encourage more efficient production and quicker delivery.

## RESEARCH AND DEVELOPMENT

The Navy requested \$10.6 billion for RDT&E programs in FY 1987. The House committee recommends a program totaling \$9.1 billion and the Senate authorizes a \$9.5-billion program. Details are in Exhibit 4.

**Penguin missile**—The Senate refused to authorize the Penguin missile program, citing program costs and anticipated marginal ben-

efits:

Penguin is a Norwegian designed, infrared homing, anti-ship missile which would provide LAMPS MK-III helicopters with a capability to attack ships and surfaced submarines.

The Committee believes that in today's funding climate, Penguin is a program whose costs (\$112.7 million) exceed its marginal benefits. Integration costs for Penguin have almost doubled (\$36.0M to \$66.0M) and the entire program will convert only 33 ships and 28 helicopters to employ the missile. Each ship will store only 4 missiles. Moreover, each helicopter will carry only one Penguin. That single missile will afford too low a probability of ship kill to warrant risking the helicopter against modern shipboard AAW defenses. Finally, the FFG-7 class ships scheduled to receive Penguin capable helicopters already have the 60-mile range Harpoon anti-ship

missile. Penguin, with its 20-mile range, would only marginally enhance those ships' warfighting capability.

The committee recommends authorization of \$3.994 million for the LAMPS program. No funds are provided for Penguin. Remaining funds provided for Penguin should be used for helicopter modifications necessary to accommodate the Mark-50 torpedo.

A news account in *Aviation Week & Space Technology* predicts congressional approval of Penguin for FY 1987. Involved in this program are Kongsberg Vapenfabrikk in Norway and Grumman Corp.

**Rankine Cycle Energy Recovery (RACER) system**—The Navy has canceled RACER developed for the DDG-51—a program that has support in the House. The House committee has recommended authorization of \$20 million for RACER development, citing the following:

QUALITY . . . DEPENDABILITY . . . EXPERIENCE

The  
**GAYLORD**  
**VENTILATOR**

GALLEY EXHAUST HOODS



- 95% GREASE EXTRACTION EFFICIENCY
- PUSH-BUTTON WATER-WASH CLEANING
- 24-HOUR FIRE PROTECTION
- NO FILTERS TO CLEAN
- NO REMOVABLE PARTS
- DESIGN ADAPTABILITY
- STANDARD EQUIPMENT ON U.S. NAVY VESSELS

With a 40 year history in progressive galley ventilation, Gaylord has continued to meet the demands of the industry with advanced engineering and innovative features; preserving the worldwide Gaylord tradition of quality and expertise.

Please write or call for a complete  
Gaylord Engineering Catalog



**GAYLORD INDUSTRIES, INC.**

P.O. BOX 558 ■ 9600 S.W. SEELY AVE. ■ WILSONVILLE, OR 97070-0558 U.S.A.  
PHONE 800-547-9696 ■ TLX/RCA 200462 GIW UR ■ FAX 503-682-2938

Circle 156 on Reader Service Card

## PRODUCT DIRECTORY

The following is a partial listing of the most frequently used commodities and their specifications; many others are available upon request.

### FASTENER SPECIFICATIONS:

BOLTS: ASTM A193, A307, A320, A325, A354, A490, F468, F593, FF S-85, MIL-B-857, MIL-S-1222  
EYE BOLTS: ASTM A489, MIL-B-45908  
MACHINE SCREWS: FF S-92  
NUTS: ASTM A194, A305, F467, F594, FF S-856, MIL-B-857, MIL-S-1222

PHOSPHOROUS BRONZE: QQ-B-750  
SILICON BRONZE: ASTM B98, ASTM B99, ALLOY 651, 655, QQ-C-591  
STAINLESS STEEL: QQ-S-763, QQ-S-764, 300 Series: 304 (304 COND B), 316 (316 COND B), 410 (410 HT), 416 (416 HT)  
STEEL, CARBON AND ALLOY: ASTM A193, A307, A324, A449, FED-STD-46, MIL-S-890, MIL-S-5000 (4340), SAE 1429  
TITANIUM: MIL-T904\*

### PLATING SPECIFICATIONS:

BLACK OXIDE: MIL-C-13924, CL.1, CL.2  
CADMIUM A: ASTM A165, QQ-P-416  
CERAMIC COATING: MIL-C-81751  
CHROMATE  
HOT DIP GALVANIZE: ASTM A153, MIL-F-17871  
HARD CHROME: QQ-C-320  
IMMERSION ZINC FLAKE: MIL-C-87115  
ION VAPOR DEPOSIT: MIL-C-83488  
MECHANICAL GALVANIZE: ASTM B1459  
NICKEL: QQ-N-290  
PHOSPHATE: MIL-P-16232  
ZINC: ASTM A164, ASTM D633, QQ-Z-325

### SELF LOCKING SPECIFICATIONS:

MIL-F-18240, CONE A/B, MIL-N-2502\*

### PINS:

FF P-386, MIL-P-10971, MIL-P-16610  
RIVETS: FF R-556, MIL-R-24243  
SOCKET SCREWS: ASTM A574, FF S-86, FF S-200, FF S-210  
STUDS: ASTM A193, MIL-B-857, MIL-S-1222, MIL-S-24149  
THREADED ROD: ASTM A193, MIL-S-1222  
WASHERS: ASTM F430, FF W-81, FF W-92, FF W-100

### MATERIAL SPECIFICATIONS:

ALUMINUM: 2024 T4, 6061 T6  
ALUMINIUM BRONZE: QQ-C-405  
HASTELLOY ALLOYS: B2, C276  
INCONEL ALLOY 625, ASTM A-466  
K-MONEL: QQ-N-286, MS1816  
MONEL: 400, ASTM B164, CL.A, CL.B, CL.C  
MONEL: 405, ASTM B164, CL.B, CL.C  
NICKEL BRASS: QQ-B-637  
NICKEL ALUMINUM BRONZE: MIL-B-24059



### MANUFACTURERS CATALOG ITEMS ALSO AVAILABLE:

ALLEN MFG.—Socket & Set Screws, Nuts & Keys  
BETHLEHEM®—Bolts, Nuts, Screws  
BUCKEYE FORGE—Eye Bolts, Small Forgings  
CHERRY—Blind Rivets  
DRIVE-LOK, INC.—Grooved & Spring Pins  
GREER-SMYRNA—Nylon Insert Lock Nuts  
GROOV-PIN—Grooved & Spring Pins Inserts  
HELI-COIL®—Coiled & Solid Inserts  
KAYNAR—High Strength Aerospace Locknuts  
LONG-LOK®—Self Locking Fasteners  
NELSON—Weld Studs  
NYLOK®—Self Locking Fasteners  
PANDUIT—Cable Ties  
SHAKEPROOF®—Washers  
S.P.S. (FLEXLOC)—High Strength Lock Nuts  
S.P.S. (UNBRAKO)—Socket & Set Screws, Keys, Pins  
SOUTHCOR, INC.—Captive Fasteners, Latches, 1/4 Turn Fasteners  
SOUTHERN SCREW—Machine & Tapping Screws  
TRIDAIR—Inserts  
WALDES—Retaining Rings

Our Quality Control system meets the requirements of MIL-I-45208A, MIL-STD-45662 and MIC Level 1

**HS HARDWARE SPECIALTY CO. INC.**  
SHIPS DIVISION

48-75 36TH STREET LONG ISLAND CITY, NEW YORK 11101  
TELEPHONE: (718) 361-9393 TWX: 710-582-2547 TELEX: 12-5468 TELECOPIER: (718) 937-5907 CABLE: HARDSPEC NYK

Circle 158 on Reader Service Card

Maritime Reporter/Engineering News

The RACER system was intended to complement the LM-2500 propulsion system on the Navy's latest destroyer—the DDG-51 Arleigh Burke Class. It was estimated that RACER would extend the range of these ships by up to 2,000 miles. During the past two-year period, however, the program has been mismanaged. The Navy did not follow Congressional guidance and, in fact, used funds authorized and appropriated for the RACER program for other purposes. The RACER system tests were suspended by the Navy, and subsequently, the contract for RACER development was canceled.

The committee does not concur in the Navy's action to cancel the RACER program and, accordingly, recommends \$20.0 million in authorization to resume testing of the RACER system for deployment on the DDG-51 as well as other platforms. Section 204 would provide that no funds be used for research, development, test and evaluation for the DDG-51 class ship until the Secretary of the Navy resumes testing of the RACER system and advises the Congress that testing will continue through completion of land-based and at-sea testing. Additionally, the RACER and DDG-51 designs must be compatible.

The Senate accepts the Navy's decision to abandon RACER. Language in the Senate authorization bill eliminates the requirement that the lead DDG-51 be capable of accommodating the RACER system.

**Surface ship enhancement**—The House committee recommends that the Navy begin a program in FY 1987 to upgrade surface ship sensor and defensive system capability. It recommends \$90 million be authorized for this effort. Of this total \$30 million would be for sensors upgrades, \$35 million for engagement improvements (e.g. hypervelocity defense missile) and \$25 million for anti-air warfare weapon development. This recommendation is one element in the "conventional defense initiative" proposed by the House committee. ■

### Defense Department's First Two-Year Budget Cycle To Begin For FY88

Deputy Secretary of Defense William H. Taft IV announced recently that the Department of Defense would use its current review of the FY 1988 defense program and budget to assess the requirements for both FY 1988 and FY 1989. The product of this review will be a two-year budget. Because this year's review will cover both FY 88 and FY 89, no program or budget review will be needed next year. The Deputy Secretary has directed that preparations for those reviews be stopped.

This action carries out the requirements of the FY 1986 Authorization Act, which directs the Presi-

dent to submit a two-year budget for the Department of Defense next year, and it carries forward the Packard Commission endorsement of the two-year budget concept.

Two-year budgeting is a key recommendation of the Packard Commission, and should bring much-needed stability to Defense spending. The DoD intends to work closely with the Congress to insure a smooth transition to a two-year budget.

## MAJOR NAVY CONTRACTS

*This special section includes major Navy contract awards issued between the dates of June 19 to August 6, 1986. For Navy contracts prior to these dates refer to MARITIME REPORTER, July 15, 1986 issue, "Major Navy Contracts," page 11. Contract awards from April 1 to June 17, 1986 are covered.*

June 19

Raytheon Company, Missile Systems Division, Bedford, Mass., is being awarded a \$107,832,229 fixed-price-incentive/performance-incentive contract for qualification and production of guidance, control and air-frame sections for Standard Missile 2 (SM-2), Block II. Work will be performed in Bristol, Tenn. (79 percent); Lowell, Mass. (11 percent), and Quincy, Mass. (10 percent), and is expected to be completed



# AMEROID® OWS

## A powerhouse cleaner that lets your oily water separator do the job it was designed to do.

AMEROID® OWS quick-separating degreaser is a heavy-duty, solvent-emulsifying detergent that's strong enough to handle all your ship's top-to-bottom cleaning chores—especially the bilge. Yet it's easy to use and won't harm your oily water separator's coalescing function. AMEROID OWS helps oily water separators

meet MARPOL oil discharge regulations! No wonder leading separator manufacturers enthusiastically recommend AMEROID OWS! Backed by more than 70 years of Drew experience and know-how, AMEROID OWS is effective and economical. And it's available worldwide through Drew's service network.

*\*For documentation, and complete information, contact your nearest Drew Ameroid Representative or*

**Drew Ameroid® Marine Division**

Drew Chemical Corporation

One Drew Plaza, Boonton, NJ 07005, (201) 263-7600, Telex: 136444

AMEROID is a trademark of Drew AMEROID and the TRITON logo are registered trademarks of Drew. © 1986 Drew. All Rights Reserved.

Circle 175 on Reader Service Card

## INVENTORY LOCATOR SERVICE AND THE MARITIME INDUSTRY...

Inventory Locator Service, Inc., set up an aircraft data base more than seven years ago. Currently, more than 7½ million line items make up that database.

ILS offers parts location, cross-referencing, and extensive NSN information. The world of commercial and military aviation has come to rely on us...the Maritime industry will, too!

ILS can now offer on-line access to:

- procurement histories for price analysis comparison
- part number or NSN number to Federal Supply Code (FSCM)
- FSCM to name of manufacturer
- Management List Consolidated (ML-C)
- Navy P2300 Series (Next Higher Assembly)
- Master Index Allowance Parts List

QPL's and Navy Symbol cross referencing will be available before year end. One inquiry using part number, NSN, Mil Spec or Drawing Number can in minutes produce a printout which could take hours or days to manually compile.

Let Inventory Locator Service, Inc., show you why over 35 DOD facilities and dozens of OEM's have come to rely on our electronic information support system.

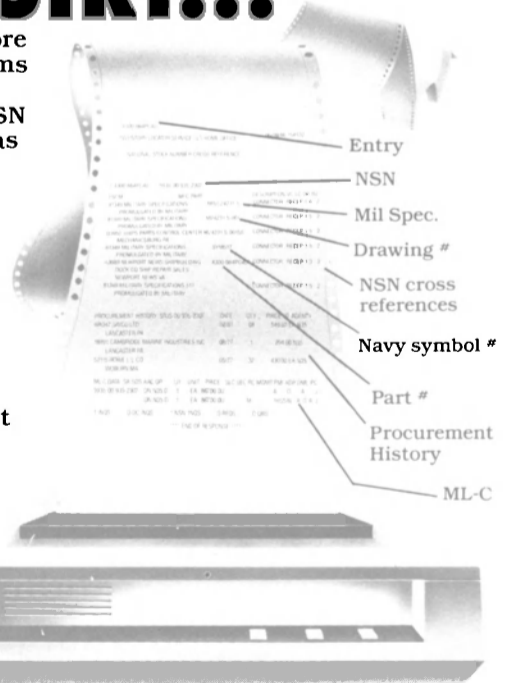


**INVENTORY LOCATOR SERVICE, INC.**

3820 Premier Avenue  
Memphis, TN 38118  
(901) 794-4784-Telex 882179 (WU)



Offices in: California, Florida, New York, Texas, Virginia, Washington, and the United Kingdom.



Circle 225 on Reader Service Card



## CURRENT NAVY, COAST GUARD & MARAD OVERHAUL, MAINTENANCE & CONVERSION CONTRACTS AT U.S. YARDS

SHIPYARD	OWNER	TYPE OF WORK	\$VALUE	COMP
Alabama Dry Dock		Phased maintenance on USS Lexington (AVT-16)	10,132,000	8/90
Atlantic Drydock		Repairs to USS Flatley (FFG-21)	6,260,259	11/86
Atlantic Marine		Repairs to USS Saratoga (CV-60)	3,500,000	9/86
Bath Iron Works		Overhaul 4 USCG cutters	117,452,000	-89
Bath-Portland		Overhaul DDs Deyo & O'Bannon	44,600,000	86-87
Bender Shipbuilding		Overhaul USS Pensacola (LSD-38)	9,670,000	4/87
Coastal Drydock		Overhaul USS Shreveport (LPD-12)	10,500,000	86
Charleston Naval Shipyard		Overhaul USS Calhoun (SSBN-630)	—	8/86
		Overhaul USS Jackson (SSBN-634)	—	8/87
		Overhaul USS Sturgeon (SSN-637)	—	9/86
Dillingham Ship Repair		Convert ex-President Polk to craneship	20,500,000	9/86
Electric Boat		Phased maintenance on SSBN-731-3	4,000,000	4/87
General Ship		Maintenance on USS Miller (FF-1091) and USS Valdez (FF-1096)	46,475,000	—
Honolulu Shipyard		Repairs to USS McInerney (FFG-8)	8,000,000	2/87
Ingalls Shipbuilding		Modernize battleship Wisconsin (BB-64)	222,800,000	88
Jacksonville Shipyards		Repairs to USNS Waccanaw (AO-109)	5,118,924	10/86
Jonathan		Phased maintenance on USS Saganaw	9,900,000	6/90
Long Beach Naval Shipyard		Modernize battleship Missouri (BB-63)	500,000,000	86
		Overhaul USS Cleveland (LPD-7)	—	1/87
		Overhaul USS Schofield (FFG-3)	—	11/86
Mare Island Navy Yard		Overhaul USS Hammerhead (SSN-663)	—	9/86
National Steel		Convert two tankers to hospital ships	336,200,000	86-87
		Phased maintenance on four LSTs	3,500,000	-90
		Overhaul USS Merrill (DD-976)	6,039,000	—
		Overhaul USS Horne (CG-30)	—	—
		Overhaul USS Leahy (CG-16)	—	—
		Maintenance on three LSTs	5,858,543	—
Newport News Shipbuilding		Overhaul USS Daniel Boone (SSBN-629)	12,800,000	8/86
		Overhaul & refuel USS Benjamin Franklin (SSBN-640)	17,063,000	1/87
		Overhaul USS Eisenhower (CVN-69)	276,600,000	1/87
		Prep for overhaul USS George Bancroft (SSBN-643)	19,400,000	3/88
		PSA for USS Chicago (SSN-721)	3,310,156	12/86
		PSA for USS Key West (SSN-722)	3,077,484	12/86
		PSA for USS Nevada (SSBN-733)	3,981,760	1/87
Norfolk Navy Yard		Overhaul USS Nassau (LHA-4)	—	9/86
Norfolk Shipbuilding		Overhaul USS Memphis (SSN-691)	—	9/86
		Phased maint. on AO-178, 179, 186	38,900,000	—
		Overhaul USS Caloosahatchee (AO-98)	3,478,000	—
		Overhaul USS Iwo Jima (LPH-2)	16,167,222	2/87
		Convert three containerships to auxiliary crane ships	46,960,000	87-88
		Overhaul USS Skate (SSN-578)	—	86
		Overhaul USS Omaha (SSN-692)	—	86
		Phased maint. on USS Patterson (FF-1061)	5-10 mil/yr	—
		Maint. on USS Oliver Hazard Perry (FFG-7)	4,861,747	7/86
		SLEP on Independence (CV-62)	240,000,000	—
		Overhaul USS Bolivar (SSBN-641)	—	12/86
		Overhaul USS Augusta (SSN-710)	5,700,000	—
		Overhaul USS James K. Polk (SSBN-645)	135,000,000	87
		Overhaul USS Ranger (CV-61)	—	86
		Overhaul USS Texas (CGN-39)	—	12/86
		Repair & overhaul USS Nimitz (CVN-68)	—	89
		Overhaul USNS Spica (T-AFS-9)	10,700,000	—
		Phased maint. on AE-29, 32-34	4,154,000	86-89
		Overhaul USS Dubuque (LPD-8)	10,000,000	—
		Repairs to USS Kansas (AOR-3) and Wichita (AOR-1)	41,600,000	—
		SRN on 4 16/26 class ships	—	—
		Overhaul USS Cayuga (LST-1186), USS Racine (LST-1191) and USS Schenectady (LST-1185)	35,000,000	87-89
		Overhaul USS Fife (DD-991)	30,347,940	9/87
		PSA for USS Germantown (LSD-42)	3,938,165	11/87
Todd-Galveston		Convert C-5 to T-AVB	27,500,000	86-87
Todd-San Pedro		Maintenance on USS Vincennes (CG-49)	3,750,000	—
		Overhaul USS Ingersoll (DD-652)	13,500,000	12/86
		Phased maintenance on AOE's	6,000,000	86-90
		Overhaul eight USCG cutters	234,903,000	-90
		SLEP for 14 buoy tenders	8,500,000	—
USCG Yard-Curtis Bay		Major maintenance on 16 WMECs	—	—

### Major Navy Contracts

(continued)

March 31, 1990. Eighteen bids were solicited and three bids were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-5382).

**General Dynamics Corporation, Pomona Division**, Pomona, Calif., is being awarded a \$12,708,683 firm-fixed-price contract for long lead time materials for Standard Missile 1 (SM-1). Work will be performed in Pomona (98 percent), and Window Rock, Ariz. (2 percent), and is expected to be completed in September 1988. Contract funds would not have expired at the end of the current fiscal year. This contract combines purchases for Australia (22 percent), Italy (5 percent), France (11 percent), the Netherlands (54 percent), and Japan (8 percent), under the Foreign Military Sales program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-5500).

#### June 20

**Lockheed Electronics Company**, Plainfield, N.J., is being awarded a \$51,700,000 firm-fixed-price modification finalizing a letter contract for hardware for MK-86 Mod 9 gun fire control systems. Work will be performed in Plainfield, and is expected to be completed January 31, 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-7044).

**Bender Shipbuilding and Repair Company Incorporated**, Mobile, Ala., is being awarded a \$9,670,000 firm-fixed-price contract for the regular overhaul of USS Pensacola (LSD-38). Work will be performed in Mobile, and is expected to be completed April 13, 1987. Nineteen bids were solicited and nine offers were received. The Supervisor of Shipbuilding, Conversion and Repair, Portsmouth, Va., is the contracting activity (N00024-85-H-8118).

#### June 24

**Westmont Industries**, Santa Fe Springs, Calif., is being awarded a \$7,370,000 fixed-price contract for the manufacture and delivery of two 25-ton portal cranes to the

Naval Submarine Base, Bangor, Wash., and one 25-ton portal crane to the Naval Submarine Base, Kings Bay, Ga. The contract contains options for two additional cranes for Kings Bay in future years and a potential value of \$12,360,000. Work will be performed in Santa Fe Springs, and is expected to be completed in December 1988. Five bids were received. The Naval Facilities Engineering Command, Philadelphia, Pa., is the contracting activity (N62472-85-C-1473).

#### June 25

**Norfolk Shipbuilding and Drydock Corporation**, Norfolk, Va., is being awarded an \$18,431,371 firm-fixed-price contract for conducting the regular overhaul availability of USS L.Y. Spear (AS-36) as part of a competitive test program between public and private shipyards. The contract will cover repairs and alterations to the hull, electrical, mechanical and combat systems. Work will be performed in Norfolk, and is expected to be completed in June 1987. Fourteen bids were solicited and four offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-H-8195).

#### June 26

**Southwest Marine Incorporated**, San Diego, Calif., is being awarded a \$3,938,165 cost-plus-award-fee contract for the post shakedown availability/phased maintenance program for USS Germantown (LSD-42). Work will be performed in San Diego, and is expected to be completed November 28, 1986. Three bids were solicited and two offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-8508).

**Seachan Electronics Incorporated**, Litz, Pa., is being awarded a \$3,610,475 firm-fixed-price contract to furnish 691 range and airframe separation programmers used in the Anti-Submarine Rocket (ASROC). Work will be performed in Litz, and is expected to be completed in June 1987. Thirty-six bids were solicited and three offers were received. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-86-C-A097).

**Loral Hycor Incorporated**, Woburn, Mass., is being awarded a \$6,703,075 firm-fixed-price contract to furnish 5,838 cartridges of 5.123 inch MK-214 Mod O chaff. Work will be performed in Woburn, and is

ANOTHER POWERFUL IDEA:

**WE'RE USING WASTE  
HEAT TO MAKE THE  
OCEAN DRINKABLE.**



Reliable Combustion Engineering waste heat recovery boilers are helping the Navy cut the cost of turning seawater into drinking water aboard the *Ticonderoga* (CG-47) class guided missile cruisers.

And that's not all our waste heat recovery boilers do. They generate high-quality saturated steam for ship's heating as well as steam for the galley, laundry and de-icing system.

Annual projected fuel savings for a CG-47 class ship is estimated at more than \$200,000.

(Based on three waste heat boilers per ship, operating an average of 5,000 hours a year, with a steam usage of 7,000 pounds per hour; fuel at \$20 per barrel.)

Achieving savings like these obviously requires high reliability. And our boilers have proven they can deliver. With over 80,000 accumulated operating hours aboard the *Ticonderoga*, *Yorktown*, *Vincennes*, and *Valley Forge* and at the NAVSSES test facility in Philadelphia, our equipment has operated without a single boiler-related failure.

What's more, the boilers are designed with maintenance in mind by incorporating ample access to the gas and water sides. This has contributed to the excellent operating record.

Powerful ideas like our waste heat recovery boilers are typical of Combustion Engineering's commitment to the U.S. Navy.

For more information, write:  
Combustion Engineering, Inc.  
Dept. CEP1-MR  
PO. Box 500  
Windsor, CT 06095-6052

**COMBUSTION ENGINEERING**

Circle 26 on Reader Service Card



## CURRENT NAVY & COAST GUARD VESSELS UNDER CONTRACT AT U.S. YARDS

SHIPYARD NAVY NUMBER	NAME	APPROX. CONTRACT \$	CONTRACT DEL'Y DATE	SHIPYARD NAVY NUMBER	NAME	APPROX. CONTRACT \$	CONTRACT DEL'Y DATE
<b>Atlantic Marine</b>				<b>Halter Marine</b>			
MK IV patrol boats (3)	unnamed	4,155,500	NA	T-AGOS-13-14	unnamed (2)	28,500,000	88
<b>Avondale Industries</b>				T-AGOS-15	unnamed	13,844,067	3/89
T-AO-187	Henry J. Kaiser	123,900,000	9/86	<b>Litton/Ingalls</b>			
T-AO-188	Joshua Humphreys	117,000,000	12/86	CG-53	Mobile Bay	332,000,000	2/87
T-AO-189	John Lenthall	116,000,000	5/87	CG-54-56	unnamed (3)	926,100,000	87-88
T-AO-190	unnamed	116,000,000	9/87	CG-57, 59	unnamed (2)	325,500,000	88
T-AO-193	unnamed	116,000,000	8/88	CG-62	unnamed	238,600,000	89
T-AO-195	unnamed	101,000,000	1/89	CG-65	unnamed	242,600,000	90
LSD-44	unnamed	166,000,000	7/88	LHD-1	Wasp	1,365,700,000	3/89
LSD-45-46	unnamed (2)	306,800,000	88-89	LHD-2	unnamed	38,877,000 <sup>2</sup>	—
LSD-47-48	unnamed (2)	300,000,000	89-90	<b>Lockheed-Gulfport</b>			
<b>Bath Iron Works</b>				LCAC	unnamed (2)	24,800,000	88
FFG-59	Kauffman	89,300,000	10/86	<b>Lockheed-Seattle</b>			
CG-51	Thomas S. Gates	305,300,000	1/87	LSD-43	Fort McHenry	271,500,000	6/87
CG-58	unnamed	252,800,000	6/88	<b>Marinette Marine</b>			
CG-60-61	unnamed (2)	383,600,000	89	MCM-2	Defender	46,000,000	8/86
CG-63-64	unnamed (2)	386,600,000	NA	MCM-4	Champion	42,000,000	—
DDG-51	Arleigh Burke	321,900,000	2/89	TWR	unnamed (5)	13,000,000	86
<b>Bell Textron Marine Systems</b>				YP Yard Patrol Craft	unnamed (20)	59,700,000	86-87
LCAC-7-12	unnamed (6)	102,000,000	NA	<b>Moss Point Marine</b>			
LCAC-13-24	unnamed (12)	197,000,000	NA	LCU	unnamed (2)	8,600,000	9/86
MSH-1	Cardinal	28,300,000	88	<b>Norfolk Shipbuilding</b>			
<b>Bender Shipbuilding</b>				Logistic Support	(Army-4)	80,000,000	89
LCM-8 type	unnamed (4)	3,000,000 <sup>3</sup>	—	<b>Newport News Shipbuilding</b>			
<b>Bethlehem-Sparrows Point</b>				CVN-71	Theodore Roosevelt	1,300,000,000	9/86
T-AGS-39-40	unnamed (2)	132,000,000	87-88	CVN-72	Abraham Lincoln	1,550,000,000	12/89
<b>Boeing Marine</b>				CVN-73	George Washington	1,550,000,000	12/91
APH	unnamed	6,900,000 <sup>1</sup>	6/87	SSN-722	Key West	225,000,000	6/87
Patrol boats (Thailand-2)	unnamed	112,000,000	—	SSN-723	Oklahoma City	225,000,000	87
<b>Bollinger Shipyard</b>				SSN-750	Newport News	278,000,000	87
WPB-1311	Naushon	5,000,000	87	SSN-753	unnamed	319,000,000	88
WPB-1312	Sanibel	5,000,000	87	SSN-756, 8-9	unnamed (3)	779,500,000	89-90
WPB-1313	Ebisto	5,000,000	87	SSN-760	unnamed	55,000,000 <sup>1</sup>	—
WPB-1314	Sepelo	5,000,000	—	SSN-21	unnamed	28,900,000 <sup>2</sup>	—
WPB-1315	Matinicus	5,000,000	—	<b>Pennsylvania Shipbuilding</b>			
WPB-1316	Nantucket	5,000,000	—	T-AO-191-2	unnamed (2)	222,000,000	89
<b>Robert E. Derektor</b>				T-AO-194	unnamed	97,500,000	90
WMEC-908	Tahoma	37,700,000	—	<b>Peterson Builders</b>			
WMEC-909	Campbell	30,160,000	—	ARS-53	Grapple	33,900,000	87
WMEC-910	Thetis	30,160,000	—	MCM-1	Avenger	64,400,000	86
WMEC-911	Forward	30,160,000	—	MCM-3	Sentry	57,900,000	87
WMEC-912	Legare	30,160,000	—	MCM-5	unnamed	57,900,000	88
WMEC-913	Mohawk	30,160,000	—	<b>RMI, Inc.</b>			
<b>General Dynamics/Electric Boat</b>				SWCM	unnamed	11,250,000	—
SSN-724	unnamed	70,121,000	5/87	<b>Tacoma Boatbuilding</b>			
SSN-725	unnamed	70,121,000	10/87	T-AGOS-9	Assertive	12,500,000	NA
SSN-751-2	unnamed (2)	560,200,000	88	T-AGOS-10	Invincible	12,500,000	NA
SSN-754-5	unnamed (2)	649,000,000	—	T-AGOS-11	Dauntless	12,500,000	NA
SSN-757	unnamed	283,000,000	6/89	T-AGOS-12	Vigorous	12,500,000	NA
SSN-21	unnamed	28,900,000 <sup>2</sup>	—	Missile ships (2-Indonesia)	unnamed	143,000,000	—
SSBN-733	Nevada	401,000,000	10/87	<b>Todd Pacific-San Pedro</b>			
SSBN-734	unnamed	523,700,000	88	FFG-60	R.M. Davis	89,900,000	10/86
SSBN-735	unnamed	531,600,000	89	FFG-61	unnamed	96,100,000	11/88
SSBN-736	unnamed	500,870,000	90				
SSBN-737	unnamed	616,400,000	90				
SSBN-738	unnamed	674,100,000	12/91				
SSN-760-63	unnamed	1,032,667,000	2/91				

Legend: 1—long-lead procurement; 2—design contract; 3—under subcontract from Twin City Shipyard

### Major Navy Contracts

(continued)

expected to be completed in March 1988. Seventeen bids were solicited and six offers were received. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-86-C-A098).

June 27

**Rockwell International Corporation, Autonetics Marine Systems Division**, Anaheim, Calif., is being issued a \$6,355,600 firm-fixed-price order to furnish 24 various electronic items to be used as spare parts in support of the AN/WSN-3A(V) (2) electronically suspended gyro navigators for shipboard use. Work will be performed in Anaheim, and is expected to be completed in July 1988. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-85-C-0370).

**SRI International**, Menlo Park, Calif., is being awarded a \$3,943,366 cost-plus-fixed-fee contract for continued research and support concerning the U.S. Air Force over-the-horizon radar system. Work will be performed in Menlo Park, and is expected to

be completed January 31, 1989. The Office of Naval Research, Arlington, Va., is the contracting activity (N00014-86-C-0406).

**Western Research Corporation**, San Diego, Calif., is being awarded a \$3,309,473 cost-plus-fixed-fee contract for the design, fabrication and testing of a rep-rated diffraction limited laser system for use in setting up and testing atmospheric compensation apparatus. Work will be performed in San Diego, and is expected to be completed December 15, 1987. The Office of Naval Research, Washington, D.C., is the contracting activity (N00014-86-C-0548).

**Rockwell International Corporation, Autonetics Marine Systems Division**, Anaheim, Calif., is being issued a \$7,865,500 firm-fixed-price order to furnish 16 various electronic items to be used as spare parts in support of the AN/WSN-3A(V) (2) electronically suspended gyro navigators for shipboard use. Work will be performed in Anaheim, and is expected to be completed in July 1988. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-85-G-0370).

**Rockwell International Corporation, Autonetics Marine Systems Division**, Anaheim, Calif., is being issued a \$3,220,000 firm-fixed-price order to furnish one electronic item to be used as spare parts in support of the AN/WSN-3A(V) (2) electronically suspended gyro navigators for shipboard use. Work will be performed in Anaheim, and is expected to be completed in July 1988. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-85-G-0370).

June 30

**Rockwell International Corporation, Autonetics Marine Systems Division**, Anaheim, Calif., is being awarded a \$10,155,000 fixed-price-incentive contract modification definitizing a previously awarded letter contract for seven AN/BQQ-9 sonar signal processing sets and related hardware for fleet ballistic missile submarines. Work will be performed in Anaheim, and is expected to be completed December 31, 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-6055).

**Halter Marine**, New Orleans, La., is being issued a \$13,844,067 modification to a previously awarded firm-fixed-price contract, to exercise an option for one T-AGOS-1 class ocean surveillance ship (T-AGOS-15). Work will be performed in Moss Point, Miss., and is expected to be completed in March 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-2046).

**Singer Company, Librascope Division**, Glendale, Calif., is being awarded a \$12,030,000 firm-fixed-price contract modification definitizing a previously awarded letter contract for seven MK-92 Mod 1 attack control consoles and six MK-96 Mod 0 weapon launch consoles production and related hardware for Trident defensive weapons systems. Work will be performed in Glendale, Calif., and is expected to be completed in April 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-6166).

(continued)



# It's bright orange for high visibility, lighter for easier handling, stronger for better performance and terrifically, cost effective. It's UltraLine from American.

American, the largest manufacturer of fiber rope in the U.S., presents the most technically advanced rope ever offered to the marine industry. UltraLine. UltraLine is a unique copolymer extrusion fiber made up into rope that is 5 percent lighter and 30 percent stronger than even our best conventional rope. You can actually save money by buying a far better product.

UltraLine is available in a wide range of sizes and constructions and, in many ways, is much like polypro: it floats, stores wet, will

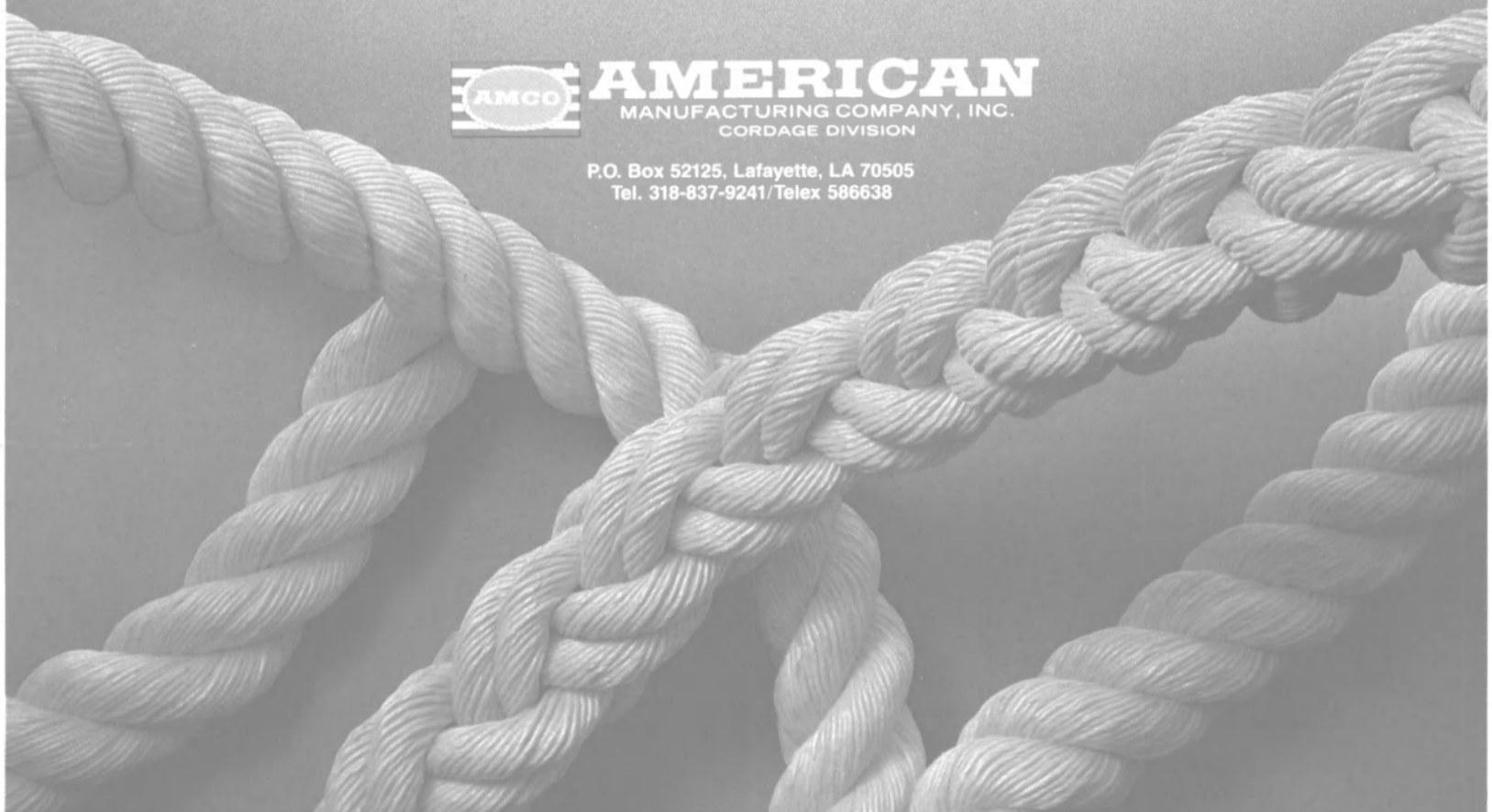
not rot or mildew. In other ways, UltraLine is much better: it has 50 percent more abrasion resistance than regular yarn or monofilament because it develops a "feathered" surface that protects it against further abrasion, plus it has lower elongation, better creep resistance

and much higher UV resistance. UltraLine. 100 percent American made from 100 percent American virgin resins. Better performance and lower cost add up to a product unmatched anywhere else. Send for complete information.

Dia.	CONVENTIONAL POLYPROPYLENE		ULTRALINE	
	Weight/100 ft. (lbs.)	Minimum Breaking Strength (lbs.)	Weight/100 ft. (lbs.)	Minimum Breaking Strength (lbs.)
7"	92	62,000	88	81,000
8"	120	81,000	115	105,000
9"	153	103,000	145	133,000
10"	190	123,000	180	160,000



P.O. Box 52125, Lafayette, LA 70505  
Tel. 318-837-9241/Telex 586638





Navy fleet oiler John Lenthall, christened and launched recently at Avondale Shipyards near New Orleans.

## Avondale Christens Replenishment Fleet Oil Building For U.S. Navy

The third in a series of six fleet oilers under construction for the U.S. Navy was christened recently by the Shipyards Division of Avondale Industries, Inc. in ceremonies at the yard near New Orleans. The new ship, the John Lenthall (T-AO-189), is named after the 19th century naval architect whose renowned services to the Navy encompassed the historic transition from sail to steam propulsion. From

1853 to 1871 he was Chief of the Navy's Bureau of Construction, and as such made significant contributions to both the practical and scientific aspects of naval architecture, most especially during the Civil War era.

Principal speaker at the christening ceremonies was Vice Adm. Cecil J. Kempf, USN, Commander Naval Reserve Force and Chief of Naval Reserve. He is also Director

of Naval Reserve, Office of the Chief of Naval Operations. His wife, Theodosia Suman Kempf, is the Lenthall's sponsor.

Others participating in the ceremonies included: U.S. Representative Lindy Boggs (D-LA); Leonard McRoskey, Deputy Assistant Secretary of the Navy; Wallace T. Sansone, Deputy Commander, Military Sealift Command, Department of the Navy; Rear Adm. Harry F. Fiske, USN, Amphibious, Auxiliary, Mine, and Sealift Ships, Naval Sea Systems Command; Albert L. Bossier Jr., president of Avondale's Shipyards Division; Capt. Paul D. Hurst, USN, Supervisor of Shipbuilding, Conversion and Repair, New Orleans; and Lt. Cdr. Denis Casey, CEC, USNR, who delivered the invocation.

The mission of the John Lenthall and other fleet oilers of her class is the transportation of bulk products from shore depots to combatants and support forces underway. These ships will also deliver limited fleet freight, cargo water, mail, and personnel.

The T-AO-189 has a cargo capacity of 183,500 barrels of oil in 18 tanks, and is capable of simultaneously receiving, storing, and discharging two separate grades of cargo fuel. All cargo pump and valve operations and the segregated ballast system are manipulated 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 transfer hoses suspended by a span wire that is automatically maintained in a constant-tension range. T-AO vessels are also capable of refueling helicopters from a vertical replenishment facility aft of the accommodations house.

The Lenthall has an overall length of 667.5 feet, beam of 97.5 feet, and maximum draft of 36 feet. Powered by twin 10-cylinder, medium-speed diesel engines, the ship has a service speed of 20 knots. The twin-screw design provides improved directional stability, ease of control, and mission reliability under combat conditions.

The six fleet oilers that Avondale is building for the Navy represent a total contract value of more than \$700 million, and provide employment for approximately 2,000 Avondale workers. During the past year, Avondale launched the first two ships in the program—the Henry J. Kaiser (T-AO-187) and the Joshua Humphreys (T-AO-188). The fourth ship in the program, the Andrew J. Higgins (T-AO-190), is scheduled to be launched in January 1987.

The Lenthall and her sister ships are being built using state-of-the-art modular construction techniques that include prefabricating and pre-outfitting individual modules that make up the ships. Each of the large modular units is assembled and outfitted with piping, ventilation ducts, electrical wireways, and other equipment in designated outfitting zones throughout the ship-

### USNS JOHN LENTHALL Major Suppliers

Main Engines	Alsthom-Atlantique
Ships service	
diesel generators	Alco Power
PTO generators	Cogenel
Main engine and PTO	
clutch coupling	Eaton
Shafting	Bird-Johnson
Line shaft bearings	Avondale
Reduction gears	Cincinnati Gear
CP propellers and	
CRP package	Bird-Johnson
Steering gear	Jered Brown Brothers
Engine room, bridge and	
cargo controls	Tano
Main switchboards and group control	
centers	Federal Pacific Electric
Emergency diesel	Energy Power
Radars	Precision Marine
Compass	Sperry
Boiler	Clayton
HP air compressor	Ingersoll Rand
Ship service	
air compressor	Ingersoll Rand
Distiller	Aqua Chemical
Valve actuators	Limitorque
A/C plant	Carrier Transicold
Incinerator	Atlas Danmark
FO and LO purifiers	Centrico
Vacuum collection	Envirovac
Sewage treatment	Red Fox
Windows	Kear Fott
Hull paint	International
Tank paint	Mobil
Replenishment-at-sea	
and deck equipment	Lake Shore
Anchor windlass	Lake Shore
Ram tensioner	Western Gear
Elevator	Unidynamics
Firefighting system	Herbert S. Hiller

yard. The pre-outfitted modules are then moved to the building site and erected into complete ships. Pre-packaged units of heavy machinery are assembled ashore and lifted aboard ship for installation. As a result of these modern techniques, the Lenthall and the previous fleet oilers built at Avondale were more than 80 percent complete at the time of their launching.

Avondale Industries is an employee-owned company comprised of seven divisions purchased from the Ogden Corporation last year. Avondale is involved primarily in marine and modular construction, metals recycling, and industrial production. With 1985 sales of \$1.15 billion, it is among the largest employee-owned corporations in the U.S.

For information and a free color brochure describing Avondale's facilities and capabilities,

Circle 96 on Reader Service Card

### Portsmouth Navy Yard Awarded \$5.7-Million Sub Overhaul Contract

The Portsmouth Naval Shipyard, located in Kittery, Maine, across the Piscataqua River from Portsmouth, N.H., has been awarded a Navy contract valued at \$5.7 million to overhaul and refuel the attack submarine USS Augusta. This is the yard's first award under the new competitive bidding procedures mandated by Congress last year as a cost-cutting measure.



Principals in the christening were (L-R): Albert L. Bossier Jr., president of Avondale's Shipyards Division; Rear Adm. Harry K. Fiske, USN, NAVSEA; Vice Adm. Cecil J. Kempf, USN, principal speaker; Theodosia Kempf, sponsor; U.S. Rep. Lindy Boggs (D-LA); and Wallace T. Sansone, deputy commander, MSC. Flower girl is Dana Snell, daughter of Mr. & Mrs. Glenn Snell, both employees at Avondale yard.

## Major Navy Contracts

(continued)

**Jacksonville Shipyards Incorporated**, Jacksonville, Fla., is being awarded a firm-fixed-price job order totaling **\$5,118,924** under a master ship repair agreement for the drydocking and voyage repair of USNS Waccanaw, a Military Sealift Command Naval Fleet Auxiliary Force ship. Work will be performed in Jacksonville. Forty-nine bids were solicited and nine offers were received. The Military Sealift Command, Atlantic is the contracting activity (N00033-85-H-0312).

**AAI Corporation**, Baltimore, Md., is being issued a **\$3,756,714** modification as additional funding to exercise an option under a firm-fixed-price contract for 90 day pack-up kits and night sensors for the short range Remotely Piloted Vehicle (RPV) system. Work will be performed in Baltimore, and is expected to be completed in February 1987. One bid was received. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-86-C-0077).

July 1

**McDonnell Douglas Astronautics Company**, St. Louis, Mo, is being awarded a **\$12,410,659** cost-plus-fixed-fee research and development contract for Tomahawk sea launched land attack cruise missile submunition guidance equipment and software. Work will be performed in St. Louis (88 percent), and San Diego, Calif. (12 percent), and is expected to be completed in September 1987. The Joint Cruise Missiles Project, Washington, D.C., is the contracting activity (N00032-84-C-4262).

**Lockheed Missiles and Space Company, Austin Division**, Austin, Texas, is being awarded a **\$27,511,795** cost-plus-incentive-fee schedule incentive contract for planned product improvement of the Tomahawk ground launched cruise missile software. Work will be performed in Austin, and is expected to be completed in March 1989. Three bids were received. The Joint Cruise Missiles Project, Washington, D.C., is the contracting activity (N00032-86-C-6217).

**General Dynamics Corporation, Convair Division**, San Diego, Calif., is being awarded a **\$9,610,000** letter contract for EX-111 rocket motor integration. Work will be performed in San Diego, and is expected to be completed in December 1989. The Joint Cruise Missiles Project, Washington, D.C., is the contracting activity (N00032-86-C-6131).

July 2

**General Dynamics Corporation, Electric Boat Division**, Groton, Conn., is being awarded a **\$9,430,806** cost-plus-fixed fee contract for special availability for USS Scamp (SSN-588). Work will be performed at U.S. Naval Submarine Base New London, Groton, and is expected to be completed September 12, 1986. The Supervisor of Shipbuilding Conversion and Repair, Groton, Conn., is the contracting activity (N62789-77-C-0001).

**Digital Equipment Corporation**, Landover, Md., is being awarded a **\$4,256,377** firm-fixed-price contract for 11 VAX 11/780 computers and associated peripherals for the inter-array processor and integrated acoustic display systems. Work will be performed in Landover, and is expected to be completed February 1989. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-86-C-0292).

**Singer Company**, Little Falls, N.J., is being awarded a **\$3,591,997** firm-fixed-price contract for three joint tactical information distribution system class 2 terminals with maintenance, special technical support and data. Work will be performed in Little Falls, and is expected to be completed March 31, 1987. The Space and Naval Warfare Sys-

tems Command, Washington, D.C., is the contracting activity (N00039-86-C-0405).

**ANADAC Incorporated**, Arlington, Va., is being issued a **\$5,892,711** modification to a previously awarded cost-plus-fixed-fee contract for the engineering and technical services for Ohio class submarines. Work will be performed in Arlington, and is expected to be completed July 31, 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-84-C-6144).

**General Dynamics Corporation, Pomona Division**, Pomona, Calif., is being issued a **\$29,650,912** order under a basic ordering agreement to furnish various repair parts in support of the Phalanx close in weapons system. Work will be performed in Pomona,

and is expected to be completed in June 1988. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-85-G-0321).

**General Dynamics Corporation, Convair Division**, San Diego, Calif., is being awarded a **\$19,964,000** cost-plus-fixed-fee contract for Tomahawk submarine launched cruise missile integration with the SSN-688 capsule launch system Phase III. Work will be performed in San Diego, and is expected to be completed in December 1987. The Joint Cruise Missiles Project, Washington, D.C., is the contracting activity (N00032-85-C-5630).

July 3

**Fairchild Weston Systems Incorporated**, Sarasota, Fla., is being awarded a

**\$3,942,064** firm-fixed-price contract for 36 model 15 AN-USH-33 (V2) recorders and associated data. Recorders are in support of the Navy EP-3E Cilop program. Work will be performed in Sarasota (65 percent), and Velizy Villacoublay, France (35 percent), and is expected to be completed December 30, 1987. Nine bids were solicited and three offers were received. The Naval Avionics Center, Indianapolis, Ind., is the contracting activity (N00163-86-C-0326).

**Raytheon Company, Equipment Division**, Wayland, Mass., is being issued a **\$6,500,000** modification to a previously awarded contract for long lead guided missile destroyer DDG-52. Work will be performed in Wayland (25 percent), and Waltham, Mass. (75 percent), and is expected

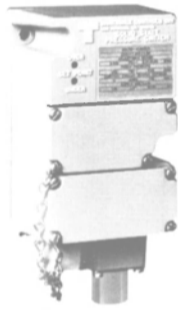
# High-Quality Components for Marine Applications

Shown are only a few of the hundreds of high-quality marine products available from a single source.

Designed for a range of shipboard or offshore applications.

## Pressure Switches

Broad choice of electromechanical or solid-state switches to provide shipwide pressure control. Included are diaphragm, bourdon tube and sealed piston types; many are explosion-proof.



## Unique Sounding Tape Ullage Indicator

Self-contained, battery-powered unit is convenient to use in shipboard and offshore tanks.



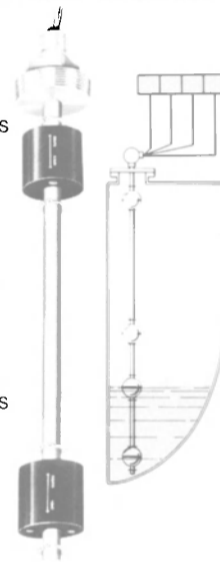
## Pressure Transmitters and Transducers

A group of lightweight transmitters and transducers are ideal for monitoring the 'mechanical health' of shipboard machinery and systems and for gauging tank contents. Included are signal conditioned models and vibration versions for monitoring rotating machinery.



## Single or Multi-Station Level Switches

Ruggedly built for use in liquids from crude to chemicals. Broad choice includes single station with slosh shielding, oil/water interface models, externally mounted styles where access is limited, and multi-station units with up to six stations spaced to suit.



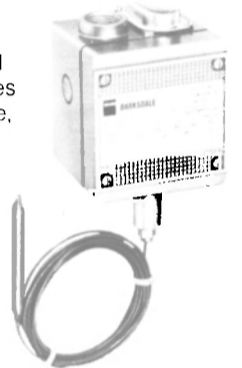
## SureSite Liquid Level Indicators

Bi-colored, interlocking magnetic flags change color as float moves with changing liquid levels. Meet requirements of MIL-I-20037B for indirect reading sight glasses. Withstand shock and vibration. Unlike cloudy, breakable sight glasses, these SureSite Indicators are highly visible, accurate and safe. Used with water, oil, or corrosive, flammable or explosive liquids.



## Temperature Switches

Local mount or remote bulb and capillary switches provide accurate, high-stability temperature control. Ideal for sensing engine manifold, lube oil and ventilation ducts, salt and fresh water cooling.



## Pumps

Axial Multi-Rotor screw pumps are designed for lube and fuel oil service, fuel transfer and hydraulic service on Naval combatant ships and auxiliary vessels. Flow rates to 1250 GPM and pressures to 3000 PSIG with the lowest noise levels available.



Get your FREE 28-page catalog now which describes products shown here as well as dozens more.



Any of the products in this catalog may be supplied from either location shown. Write for your FREE copy of the new catalog or circle the appropriate reader service number

**Transamerica Delaval**

### For customers in Europe:

Transamerica Instruments Ltd., Marine Dept.  
Lennox Road  
Basingstoke, Hampshire RG22 4AW  
ENGLAND  
Telephone: (0256) 20244.  
Telex: 858103 (CECBAS G)

Circle 219 on Reader Service Card

### For customers in the U.S. or Far East:

Transamerica Delaval  
Cowles Road  
Plainville, CT 06062 U.S.A.  
(203) 677-1311.  
Telex: 99306

Circle 220 on Reader Service Card

# MAJOR NAVY CONTRACTS

(continued)

to be completed October 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-84-C-5124).

**July 7**

**Hughes Aircraft Company**, Fullerton, Calif., is being issued a **\$60,116,101** modification to a previously awarded fixed-price letter contract for AN/UYA-4 displays, peripheral equipment, installation and repair parts, field changes and engineering support. Work will be performed in Fullerton, and is expected to be completed in June 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-7087).

**Litton Systems Incorporated, Guidance and Control Systems Division**, Woodland Hills, Calif., is being awarded a **\$26,430,756** fixed-price contract for 44 Inertial Navigation Systems (INS), ancillary equipment, spares, data and services. The contract includes options for 34 additional systems. Work will be performed in Woodland Hills, and is expected to be completed in March 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-4197).

**General Dynamics Corporation, Convair Division**, San Diego, Calif., is being awarded a **\$5,368,436** firm-fixed-price contract for support engineering and training equipment for the Tomahawk cruise missile. Work will be performed in San Diego. The Joint Cruise Missiles Project Office, Washington, D.C., is the contracting activity (N00032-84-C-4120).

**General Dynamics Corporation, Convair Division**, San Diego, Calif., is being awarded a **\$41,463,000** cost-plus-fixed-fee contract for BGM-109D transition production for the Tomahawk sea-launched cruise missile. Work will be performed in San Diego, and is expected to be completed in October 1987. The Joint Cruise Missiles Project Office, Washington, D.C., is the contracting activity (N00032-84-C-4120).

**July 9**

**Rockwell International**, Cedar Rapids, Iowa, is being awarded a **\$3,100,500** modification as additional funding under a fixed-

price contract for the AN/ARC-182(V) radio system. Work will be performed in Cedar Rapids, and is expected to be completed in December 1988. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-84-C-0128).

**Atlantic Drydock Corporation**, Fort George Island, Fla., is being awarded a **\$6,260,259** firm-fixed-price contract for repair and drydocking of USS Flatley (FFG-21). Work will be performed in Fort George Island, and is expected to be completed November 25, 1986. Two bids were solicited and two offers were received. The Supervisor of Shipbuilding, Conversion and Repair, Jacksonville, Fla., is the contracting activity (N00024-85-H-8111).

**July 11**

**Singer Company**, Little Falls, N.J., is being issued a **\$7,467,000** modification to a previously awarded cost-plus-fixed-fee contract for MK-6 guidance systems for the Trident missile program. Work will be performed in Wayne, N.J., and is expected to be completed in October 31, 1988. This modification provides a portion of the FY-86 funds for this incrementally funded contract. The Strategic Systems Program Office, Washington, D.C., is the contracting activity (N00030-86-C-0090).

**Gould Incorporated**, Cleveland, Ohio, is being awarded a **\$3,292,537** order under a basic ordering agreement to furnish 48 control units in support of the MK-48 torpedo system. Work will be performed in Cleveland, and is expected to be completed in 1988. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-84-G-0229).

**Johns Hopkins University, Applied Physics Laboratory**, Laurel, Md., is being awarded a **\$11,471,300** modification to a previously awarded cost-plus-fixed-fee contract for research in strategic/tactical systems, space science, geophysics, biophysics, energy conversion, microelectronics and robotics. Work will be performed in Laurel, and is expected to be completed December 31, 1986. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-5301).

**July 14**

**McDonnell Douglas Corporation**, St.

Louis, Mo., is being awarded a **\$285,000,000** fixed-price contract for 435 Harpoon missiles and 24 inert instrumented Harpoon training missiles. Work will be performed in St. Louis (90 percent); Tulsa, Okla. (5 percent), and Titusville, Fla. (5 percent), and is expected to be completed in June 1989. This contract combines purchases for the U.S. Navy (75.7 percent), and for the United Kingdom (1.3 percent), Pakistan (5 percent), Japan (6.6 percent), Canada (0.5 percent), Australia (2 percent), the Netherlands (0.6 percent), Singapore (7 percent), Thailand (0.2 percent), and Turkey (1.1 percent), under the Foreign Military Sales program. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-85-C-0415).

**Litton Systems Incorporated, Ingalls Shipbuilding Division**, Pascagoula, Miss., is being awarded a **\$221,762,170** modification to a previously awarded firm-fixed-price-performance-incentive contract for the reactivation and modernization of battleship Wisconsin (BB-64). Work will be performed in Pascagoula (80 percent), and New Orleans, La. (20 percent), and is expected to be completed in October 1988. Six bids were solicited and one offer was received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-2043).

**Computer Science Corporation, Applied Technology Division**, Camarillo, Calif., is being awarded a **\$7,981,953** cost-plus-award-fee contract for engineering services in support of the Electronic Warfare Directorate at the Pacific Missile Test Center, Point Mugu, Calif. Work will be performed in Point Mugu (20 percent), and Camarillo (80 percent), and is expected to be completed in July 1987. One hundred twenty-six bids were solicited and six offers were received. The Naval Regional Contracting Center, Long Beach, Calif., is the contracting activity (N00123-86-C-0210).

**General Electric Company**, Pittsfield, Mass., is being issued a **\$34,007,078** modification to a previously awarded cost-plus-incentive-fee contract for fire control subsystems for the Trident missile program. Work will be performed in Pittsfield, and is expected to be completed in December 1988. This modification provides a portion of the FY-86 funds for this incrementally funded contract. The Strategic Systems

Program Office, Washington, D.C., is the contracting activity (N00030-86-C-0074).

**Hughes Aircraft Company**, El Segundo, Calif., is being issued a **\$16,793,269** modification to a previously awarded contract for guidance system components for the Trident missile program. Work will be performed in El Segundo, and is expected to be completed October 31, 1988. The Strategic Systems Program Office, Washington, D.C., is the contracting activity (N00030-86-C-0042).

**July 15**

**McDonnell Douglas Astronautics Company**, St. Louis, Mo., is being awarded a **\$34,955,437** firm-fixed-price contract for Harpoon shipboard command and launch control systems, and encapsulated Harpoon command and launch systems for various ships. Work will be performed in St. Louis, and is expected to be completed December 31, 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-5339).

**July 16**

**Research Triangle Institute**, Research Triangle Park, N.C., is being awarded a **\$5,823,642** cost-plus-fixed-fee contract for semiconductor diamond technology research. Work will be performed in Research Triangle Park, and is expected to be completed December 31, 1988. One bid was received. The Office of Naval Research, Arlington, Va., is the contracting activity (N00014-86-C-0460).

**Lockheed Missiles and Space Company, Austin Division**, Austin, Texas, is being awarded a **\$3,141,716** cost-plus-fixed-fee modification contract for additional track control group software design agent effort for the Tomahawk cruise missile. Work will be performed in Austin. The Joint Cruise Missiles Project Office, Washington, D.C., is the contracting activity (N00032-85-C-5293).

**July 17**

**FMC Corporation, Northern Ordnance Division**, Minneapolis, Minn., is being awarded a **\$4,065,539** fixed-price-incentive contract for AN/USC-40(V) digital data distribution for Terrier/Tarter capable ships. Work will be performed in Fridley, Minn., and is expected to be completed in June 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-5311).

**General Electric Company, Undersea Systems Department**, Syracuse, N.Y., is being awarded a **\$10,374,128** modification to a fixed-price-incentive contract for two sets of AN/SQS-53C(V) sonar long lead materials. Work will be performed in Syracuse, and is expected to be completed in October 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-6116).

**July 18**

**Vitro Corporation**, Silver Spring, Md., is being awarded a **\$6,756,000** cost-plus-fixed-fee contract for engineering services for the Trident missile program. Work will be performed in Silver Spring, and is expected to be completed January 31, 1991. The Strategic Systems Program Office, Washington, D.C., is the contracting activity (N00030-86-C-0116).

**Newport News Shipbuilding and Dry Dock Company**, Newport News, Va., is being awarded a **\$3,077,484** cost-plus-fixed-fee contract for planning and material support for USS Key West (SSN-722) post-shakedown availability. Work will be performed in Newport News, and is expected to be completed December 19, 1986. The Supervisor of Shipbuilding, Conversion and Repair, Newport News, Va., is the contracting activity (N00024-86-H-8002).

**Newport News Shipbuilding and Dry Dock Company**, Newport News, Va., is being awarded a **\$3,310,156** cost-plus-fixed-fee contract for planning and material support for USS Chicago (SSN-721) post-shakedown availability. Work will be performed in Newport News, Va., and is expected to be completed December 19, 1986. The Supervisor of Shipbuilding, Con-

(continued)

## USN/MSI Newport Complex...

## ANY FOUR SHIPS MANEUVERING IN ANY HARBOR

Whether the objective is to reinforce the "seaman's eye" or to test the feasibility of a harbor improvement, the USN/MSI complex will represent the state-of-the-art in maritime simulation.

For more information call Tom Garrigan at (718) 565-4125.

**MarineSafety**  
international  
LaGuardia Airport  
New York, New York 11371



Circle 186 on Reader Service Card



Research ship Alliance is under construction at Muggiano yard of Fincantieri in La Spezia. Sophisticated vessel will be powered by GMT/AEG diesel-electric plant.

## Research Ship For NATO Launched At Muggiano Yard of Fincantieri-CNI

An oceanography and hydrographic research vessel with exceptional features and designed to meet stringent requirements, particularly for silent and vibrationless running for underwater acoustic and other research work, was recently christened Alliance by **Lady Carrington**, wife of the Secretary General of the North Atlantic Treaty Organization.

This ship bears the distinction of being NATO's first wholly owned vessel. When delivered next year from the Muggiano shipyard of Fincantieri-Cantieri Navali Italiani in La Spezia, she will operate under the West German commercial flag conducting research on behalf of NATO, commanded by a German captain, manned by British officers and Italian crew, and managed by Glasgow-based Denholm Ship Management.

With such a combination, the Alliance is well named. This 3,200-gt ship has been built and engined in

Italy by Fincantieri; the generators, propulsion motors, extensive automation, and control systems were designed and engineered by AEG in West Germany; the dynamic positioning system via satellite, and special vibration-absorbing insulation were provided by U.S. companies; the two rotary vane steering gears are from Norway; the lifeboats and davits are from the U.K.; the propellers were cast in the Netherlands; and a gas turbine for auxiliary propulsion power was supplied from Norway. Even Switzerland has contributed special potable water treatment, making this a truly multinational ship.

The Alliance will enter service next year with the SACLANT Research Center in La Spezia, NATO's principal facility for underwater research. She will be equipped to operate in any part of the world, and is strengthened for operations in ice. With most ships designed and built for oceanographic research, the ability to move or drift in near absolute silence and minimum sea disturbance are most important. From the early design stage, the standards set for this vessel were exceptional.

The main and auxiliary diesel engines, the generators, propulsion motors, and other machinery are all mounted on special resilient footings, and in some cases with double such seatings. All moving machinery is housed in acoustically insulated compartments, as are the steering gears and other items of machinery. In fact, subcontractors were selected largely on the ability of their equipment to meet the low noise and vibration standards specified. Airborne noise was also a major consideration.

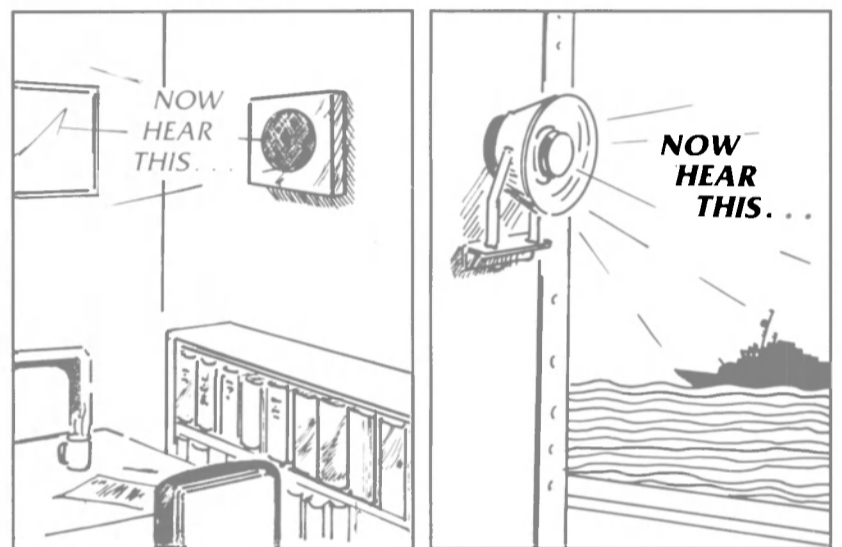
The extent to which measures were applied against shipboard vibration is indicated by the special anti-vibration insulation system used in the double-bottom tanks below or adjacent to vibrating ma-

chinery, especially on the shell plating. Special thermal/acoustic tiles supplied by Lord Kinomatics of Erie, Pa., are attached to the steel plating by special adhesives.

The diesel-electric plant for main propulsion consists of two Fincantieri-GMT B230 12-cylinder, medium-speed, 4-stroke 2,535-bhp engines, each driving an AEG 660-volt, 60-cycle AC generator running at 1,500 rpm and specially constructed

to meet specific requirements for minimum noise and vibration. Each alternator is self-ventilated and enclosed in an acoustic container with an integral fire-extinguishing system, as well as a 220-volt space heater. The power generated is then fed through AC/DC rectifiers to each of the two AEG 1,470-kw propulsion motors, each driving at about 130 rpm a shaft and Lips adjustable-pitch propeller. Like the alterna-

### LIBERTY CALL OR... EMERGENCY ALERT



The Message is Loud and Clear.  
with the advanced design

### HENSCHEL® SHIPBOARD ANNOUNCING SYSTEM

You get:

- The loudspeaker output you need with no overload...
- Computer "shaped" voice output for sharp, clear messages...
- Synthesized emergency alarm signals...
- Pre-established priorities for announcements and alerts...
- Customized system control panels...
- Modular design for easy future changes, expansion or refit.



**HENSCHEL**

9 Hoyt Drive • P.O. Box 30  
Newburyport, Massachusetts 01950  
(617) 462-2400 Telex: (RCA) 294074

#### ALLIANCE Major Suppliers

Main engines (2)	GMT
Main generators	AEG
Main propulsion motors	AEG
Aux. propulsion gas turbine	Kongsberg
Aux. propulsion alternator	AEG
Machinery control system	AEG
Steering gear	Frydenbo
Propellers	Lips
Bow thruster	Fincantieri
Couplings	SKF
Auxiliary generators (3)	AEG
Aux. generator engines	Isotta Fraschini
Battery charger	AEG
Vibration-absorbing tiles	Lord Kinomatics
Main towing winch	CNI
Aux. towing winch, deck crane, portable pneumatic winch, A-frame, & oceanographic winch	Pellegrini
Windlasses & capstans	CNI
Lifeboats	Watercraft

Circle 172 on Reader Service Card

## Alliance Launched

(continued)

tors, the propulsion motors are arranged for thyristor control, and have special magnetic circuits and special ball bearings to meet acoustic control requirements.

In essence, each main engine drives an AC generator, which supplies via thyristor converters the DC propulsion motors, each with a maximum continuous rating of 1,890 kw at 1,200 rpm. Couplings between the

stern tube shafts and the thrust shafts are of the SKF flange type, but the couplings between the main propulsion motors and thrust shafts are flexible.

Three diesel-driven 450-kw generator sets are installed on resilient mountings for the ship's electrical services. Each has an Isotta Fraschini 10 36SS 12-cylinder, V-type engine of 450 kw output, coupled on a common bedplate to an AEG 450-volt, 60-Hz generator.

Classed by the American Bureau of Shipping, the Alliance has an

overall length of about 305 feet, beam of 50 feet, depth to weather deck of 28.5 feet, and scantling draft of 16.7 feet. The ship is designed for a maximum continuous speed of 17 knots, a free-running service speed of 16.3 knots, or a speed of 12 knots with a 20-ton tow.

Accommodations will be provided for a total of 50 persons, including scientists, officers, and crew, all in air conditioned cabins, mainly single-berth with private bathrooms. This ship is fitted with bilge keels to insure stable working conditions as

well as a passive (Flume type) stabilizing system.

For further information on the services and facilities available from Fincantieri-Cantieri Navali, including free color literature,

Circle 34 on Reader Service Card

## Sealift Command Plans To Purchase Additional Ships For Ready Reserve Fleet

The Navy's Military Sealift Command will accept offers on September 30 this year for various types of merchant ships to be procured during FY 87 that will become part of the Ready Reserve Fleet (RRF). In January this year the Navy purchased 13 ships for the RRF at a cost of \$206.7 million.

The RRF, a unit of the National Defense Reserve Force, will consist of 83 ships by October this year. The Navy is committed to achieving a goal of 120 RRF ships by the end of FY 1992.

In the latest procurement, the MSC will buy the most advantageous mix of militarily useful ships from among those offered on September 30. The Navy intends to take delivery and become the owner of record of these ships not later than September 30, 1987.

The MSC's current priority is for clean products tankers in range of 20,000 to 50,000 dwt, followed by fast breakbulk ships capable of speeds greater than 20 knots. These would be modified later to provide underway replenishment capability. The third priority at present is for semi-submersible, heavy-lift ships capable of lifting and transporting items weighing in excess of 1,000 long tons.

## MSC To Procure Up To Six Logistic Support Vessels For U.S. Army

The Navy's Military Sealift Command (MSC) has announced that it intends to procure on the open world market during FY 1986 up to six logistic support vehicles (SLV) from one or more offerors. If purchased from a foreign seller, the vessels must be reflagged and all conversion work performed in U.S. shipyards.

The Request For Proposal (RFP N00033-86-R-4011) was issued by the MSC in July; proposals were due on August 22 this year. The Navy is purchasing these vessels for the Army because of the Navy's extensive experience in securing shipping services for the Department of Defense.

When purchased, the LSVs will be used by the Army to transport dry cargo on the ocean and the coastal and inland waterways. They must be able to carry a minimum of 1,500-2,000 short tons of vehicles, containers, and/or general cargo. The LSVs also will be used to assist in discharging and backloading ships during roll-on/roll-off operations as well as logistics over-the-shore missions. The LSVs must also be capable of landing on remote and underdeveloped coastlines.

## Copper Blast would like to dust off your blasting budget.



Dust (shown here from silica sand) means lower cutting efficiency and visibility and increased health hazards and clean-up costs.



COPPER BLAST (in use here) has very little dust, is low in free silica, cuts 30-50% better than lower-quality slag abrasives and up to four times better than many silica sands.

We can tell you how much the dust in your present abrasive is costing and how much you can save by using COPPER BLAST.

COPPER BLAST is a low free silica, low dust abrasive with a 30%-50% cutting advantage over lower-quality slags. It cuts up to four times faster than many silica sands. With COPPER BLAST, job time goes down and cost effectiveness goes up.

The first step could be our COPPER BLAST Value Worksheet. Using your project figures, you can see how much dust particles — which do no work! — are costing you. We'll also show you how COPPER BLAST can save time and money on your jobs plus the results of laboratory tests on several kinds of abrasives.

COPPER BLAST is manufactured in a new, high-tech plant and adequate supplies are always available throughout the West and Midwest.

For your COPPER BLAST Value Worksheet, or for more information, call or write James D. Hansink, Manager, Construction Materials, Rocky Mountain Energy, 10 Longs Peak Drive, Box 2000, Broomfield, CO 80020. Or return the reader response card in this publication.

Call toll-free: 800/525-8113.  
(In Colorado, call collect 303/469-8844).



## ROCKY MOUNTAIN ENERGY

A Subsidiary of Union Pacific Corporation  
Circle 196 on Reader Service Card

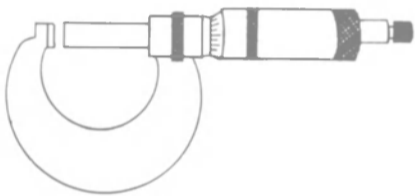
# TROY

BRASS, BRONZE,  
STAINLESS STEEL AND  
MONEL FASTENERS

THE ORIGINAL NON-FERROUS  
SPECIALISTS SINCE 1912

Quality Control Program

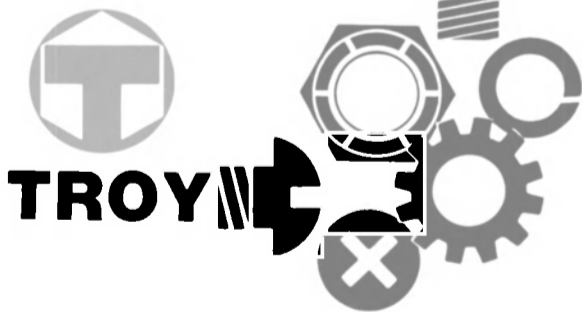
IN ACCORDANCE WITH  
MIL-I-45208  
MIL-C-45662



Specification Requirements I.A.W.

MIL-S-1222  
MIL-B-857  
MIL-F-19700

SAME DAY SERVICE ON  
INQUIRIES AND SHIPMENTS



**T.A. & D.A. TROY CO., INC.**

EASTERN STATES  
CORPORATE OFFICE  
315 Fairfield Road  
Fairfield, N.J. 07006  
N.J. 201-228-3553  
FAX: 800-772-3693  
TELEX: 219285TROYUR

WESTERN STATES  
5787 Washington Blvd.  
Commerce, Calif. 90040  
213-726-7060

\*Trademark of INCO

Circle 285 on Reader Service Card

## Major Navy Contracts

(continued)

version and Repair, Newport News, Va., is the contracting activity (N00024-86-H-8002).

**Newport News Shipbuilding and Dry Dock Company**, Newport News, Va., is being awarded a **\$3,981,760** cost-plus-fixed-fee contract for planning and material support for USS Nevada (SSBN-733) post-shakedown availability. Work will be performed in Newport News, and is expected to be completed January 26, 1987. The Supervisor of Shipbuilding, Conversion and Repair, Newport News, Va., is the contracting activity (N00024-86-H-8002).

**July 21**

**Hydrosience Incorporated**, Dallas, Texas, is being awarded a **\$5,339,380** firm-fixed-price contract for oceanographic equipment. Work will be performed in Dallas, Texas (20 percent), and at sea (80 percent), and is expected to be completed September 30, 1987. Twenty-two bids were solicited and two offers were received. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-86-C-0334).

**July 22**

**University of Rhode Island**, Kingston, R.I., is being issued a **\$3,054,119** cost-reimbursement-type contract modification for continued oceanography support. Work will be performed in Kingston, and is expected

to be completed December 31, 1987. The work will be incrementally funded with **\$1,769,253** in FY-86 funds, and **\$1,284,866** in FY-87 funds. This contract modification was competitively procured under a Broad Agency Announcement issued by the Office of the Chief of Naval Research. The Office of Naval Research, Arlington, Va., is the contracting activity (N00014-81-C-0062).

**Ford Aerospace & Communications Corporation, Aeronutronic Division**, Newport Beach, Calif., is being awarded a **\$3,607,123** firm-fixed-price contract for cold gas servo first article qualifications test program for the Sidewinder Guidance Control System (SGCS). Work will be performed in Newport Beach, and is expected to be completed in June 1987. Nine bids were solicited and three offers were received. The Naval Weapons Center, China Lake, Calif., is the contracting activity (N60530-86-C-0484).

**July 23**

**Gould Defense Systems Incorporated, Defense Electronics Division**, Glen Burnie, Md., is being issued a **\$35,049,418** modification definitizing a previously awarded fixed-price-incentive contract for subsystems of the AN/SQR-19 Towed Array Sonar System (TACTASS) for various types of surface ships. Work will be performed in Glen Burnie, and is expected to be completed in February 1990. This contract combines purchases for the U.S. Navy (60 percent), and for Canada (40 percent),

under the Foreign Military Sales program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-83-C-6294).

**July 24**

**Columbia Research Corporation**, Arlington, Va., is being awarded a **\$5,188,925** cost-plus-fixed-fee contract for logistical technical data for SSN-688, SSBN-726 and SSN-21 class submarines. Work will be performed in Arlington, and is expected to be completed December 31, 1989. Seventy-one bids were solicited and three offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-6116).

**Southwest Marine Incorporated, San Diego Division**, San Diego, Calif., is being

awarded a **\$30,347,940** fixed-price contract for the regular overhaul of USS Fife (DD-991). Work will be performed in San Diego, and is expected to be completed September 25, 1987. Eleven bids were solicited and five offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-8514).

**Grumman Aerospace Corporation**, Bethpage, N.Y., is being issued a **\$4,349,843** order as additional funding under a firm-fixed-price contract for 16 end items of weapon replacement assembly level support equipment for the new APS-139 radar. Work will be performed in Bethpage, and is expected to be completed in June 1989.

The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-83-C-0007).

**Grumman Aerospace Corporation**, Bethpage, N.Y., is being issued a **\$12,895,353** order as additional funding under a firm-fixed-price contract to develop 30 test program sets in support of the new APS-139 radar. Work will be performed in Bethpage, and is expected to be completed in June 1989. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-84-C-0046).

**July 25**

**Amex Systems Incorporated**, Compton, Calif., is being issued a **\$3,113,764** modification to a previously awarded firm-fixed-price contract for 141 ON-143(V)6's with spares and data for the Navy Satellite Communications (NSC) system that supports the exchange of tactical targeting data between surface ships, submarines and shore support sites. Work will be performed in Compton, and is expected to be completed September 30, 1987. This contract combines purchases for the U.S. Navy (94 percent), and for the United Kingdom (6 percent) under the Foreign Military Sales program. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-85-C-0238).

**AT&T Technologies**, Greensboro, N.C., is being issued a **\$5,990,000** modification to a previously awarded cost-plus-fixed-fee contract for oceanographic research. Work will be performed in Greensboro, and is ex-

**From Samoa to San Francisco  
From Los Angeles to San Diego  
For QUALITY  
VERSATILITY  
PERFORMANCE**



**SOUTHWEST MARINE, INC.**

SPECIALISTS IN THE REPAIR, MODERNIZATION & MAINTENANCE OF SEAGOING VESSELS

**SAN DIEGO YARD**  
Southwest Marine, Inc.  
2001 La Jolla Village Drive  
P.O. Box 13308  
San Diego, CA 92113  
(619) 238-1000  
TWX No. 910-335-1167

**SAN PEDRO YARD**  
Southwest Marine, Inc.  
985 S. Seaside  
P.O. Box 3347  
Terminal Island, CA 90731  
(213) 519-0600  
TWX No. 910-345-6638

**SAN FRANCISCO YARD**  
Southwest Marine of San Francisco, Inc.  
P.O. Box 7644 (Per 28)  
San Francisco, CA 94120  
(415) 543-0495

**SAMOA YARD**  
Southwest Marine of Samoa, Inc.  
P.O. Box 1187  
Pago Pago  
American Samoa 96799  
884-633-4122  
Telex 525 SWM SB

SOUTHWEST MARINE, INC. 1983

# STACEY—

The cheapest way to blind a line.



**TIME.** One man can change the blind in minutes vs two men in hours. Better, faster, safer = savings.

**RELIABLE.** Absolute downstream protection. No leakage, no seepage, no surprises, less maintenance = savings.

**STOCKING.** Standard sizes and materials (Model 601A-J) are in stock ready to ship. Less downtime = savings.

**COMPUTER AIDED DESIGN.** Call us if you have a special need. Buy exactly what you need. No more...no less = savings.

**VARIETY.** Made in all sizes, pressures, materials and codes.

**COST.** Priced right... Little or no maintenance... Easy fast, reliable, and versatile. All adds up to make Stacey line blinds the best value on the market.

# STACEY FETTEROLF CORPORATION

Made in U.S.A.

P.O. Box 103, Skippack, PA 19474 Phone: (215) 584-1500  
TWX: 510-660-0141 FETTEROLF SKIP

Circle 211 on Reader Service Card

Circle 237 on Reader Service Card

## Major Navy Contracts

(continued)

pected to be completed September 30, 1986. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-86-C-0016).

**Manson Construction and Engineering Company**, Seattle, Wash., is being awarded a **\$3,620,050** fixed-price contract for dredging for the Naval Station, San Diego, Calif. Work is expected to be completed in June 1987. Three bids were received. The Naval Facilities Engineering Command, San Bruno, Calif., is the contracting activity (N62474-84-C-4431).

**Grumman Aerospace Corporation**, Bethpage, N.Y., is being issued an **\$8,912,240** order as additional funding under a firm-fixed-price contract for 172 line items of E-2C support equipment primarily for the initial outfitting of the aircraft carrier Abraham Lincoln (CVN-72). Work will be performed in Bethpage, and is expected to be completed in December 1988. The Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-85-C-0094).

July 29

**Bird Engineering-Research Associates Incorporated**, Vienna, Va., is being awarded a **\$3,467,252** cost-plus-fixed-fee contract for

engineering services for the Aegis shipbuilding program. Work will be performed in Arlington, Va., and is expected to be completed July 30, 1991. One hundred eleven bids were solicited and two offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-6074).

**International Business Machines Corporation, Federal Systems Division**, Manassas, Va., is being issued a **\$3,785,489** firm-fixed-price order to furnish 53 various electronic items to be used as spare parts in support of the AN/BQQ-5 sonar systems and the AN/UUH-2 disk memory storage unit for shipboard use. Work will be performed in Manassas, Va., and is expected to

be completed in July 1988. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-85-G-0302).

**Sparton Corporation, Sparton Electronics Division**, Jackson, Mich., is being awarded a **\$7,336,817** firm-fixed-price modification to establish a rolling inventory of 25,655 parts sets for the AN/SSQ-77A sonobuoy. Work will be performed in DeLeon Springs, Fla., and is expected to be completed in September 1987. Two bids were solicited and two offers were received. The Naval Avionics Center, Indianapolis, Ind., is the contracting activity (N00163-86-C-0008).

**Sparton Corporation, Sparton Electronics Division**, Jackson, Mich., is being awarded a **\$13,329,630** firm-fixed-price modification to furnish 26,763 AN/SSQ-53B sonobuoys with LAU-126/A launcher containers and to establish a rolling inventory of 41,810 parts sets for the sonobuoys. Work will be performed in DeLeon Springs, Fla., and is expected to be completed in September 1988. Three bids were solicited and three offers were received. The Naval Avionics Center, Indianapolis, Ind., is the contracting activity (N00163-86-C-0007).

**Magnavox Government and Industrial Electronics Company**, Fort Wayne, Ind., is being awarded a **\$7,336,875** firm-fixed-price modification to establish a rolling inventory of 27,300 parts sets for the AN/SSQ-77A sonobuoy. Work will be performed in Garrett, Ind., and is expected to be completed in September 1987. Two bids were solicited and two offers were received. The Naval Avionics Center, Indianapolis, Ind., is the contracting activity (N00163-86-C-0010).

**Magnavox Government and Industrial Electronics Company**, Fort Wayne, Ind., is being awarded a **\$15,557,317** firm-fixed-price modification to furnish 37,483 AN/SSQ-53B sonobuoys with LAU-126/A launcher containers and to establish a rolling inventory of 42,000 parts sets for the sonobuoys. Work will be performed in Garrett, Ind., and is expected to be completed in March 1988. Three bids were solicited and three offers were received. The Naval Avionics Center, Indianapolis, Ind., is the contracting activity (N00163-86-C-0006).

July 30

**Designers and Planners Incorporated**, Arlington, Va., is being awarded a **\$6,850,186** cost-plus-fixed-fee contract modification for ship design support for new ship designs, modernizations, modifications and conversions. Work will be performed in Arlington, and is expected to be completed June 30, 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-84-D-4501).

**John J. McMullen Associates Incorporated**, Arlington, Va., is being awarded a **\$6,673,774** cost-plus-fixed-fee contract modification for ship design support for new ship designs, modernizations, modifications and conversions. Work will be performed in Arlington, and is expected to be completed June 30, 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-84-D-4013).

**Sperry Corporation, Sperry Gyroscope Division**, Great Neck, N.Y., is being issued a **\$4,075,383** provisioned items order for 240 line items in support of the AN/SPG-55B MK 76 radar system for shipboard use. Work will be performed in Great Neck, and is expected to be completed November 30, 1987. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00024-85-C-5401).

July 31

**General Dynamics Corporation, Pomona Division**, Pomona, Calif., is being awarded a **\$9,200,000** modification to a cost-plus-fixed-fee contract for engineering services for the Standard Missile (SM). Work will be performed in Pomona, and is expected to be completed in December 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-5552).

# BEYOND BRASS!

## COMMANDER™ BEARINGS FROM BFGOODRICH TAKE YOU THERE.

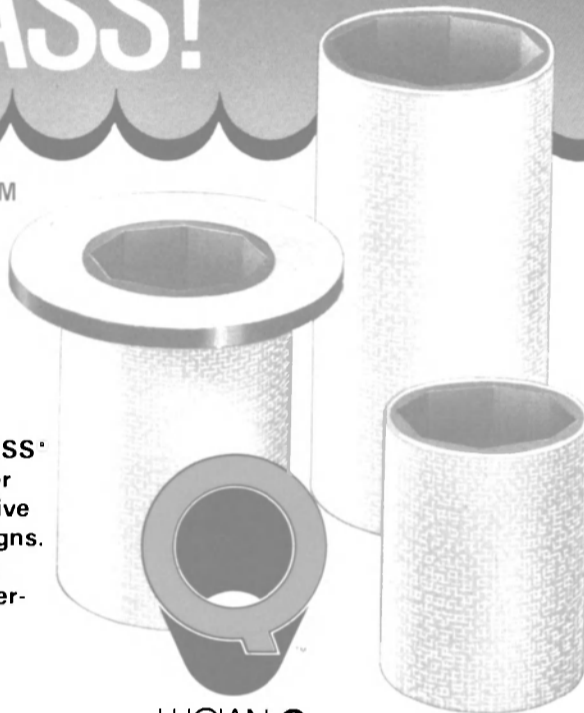
Now, you can get all the benefits of the popular CUTLESS® water-lubricated bearing technology, engineered to higher performance levels. BFGoodrich has developed an exclusive engineered composite shell for both sleeve and flange designs. The CUTLESS COMMANDER delivers the toughness and corrosion resistance you need while weighing up to 70 percent less than a comparable brass shell bearing.

Simplify installation, ease removal and lower your maintenance cost today with the BFGoodrich CUTLESS COMMANDER bearings.

Call or write for more information.

P.O. Box 1415, Akron, Ohio 44309

Telephone: (216) 733-9955 Telex: 986432



LUCIAN Q.  
MOFFITT, INC.  
A subsidiary of  
BFGoodrich

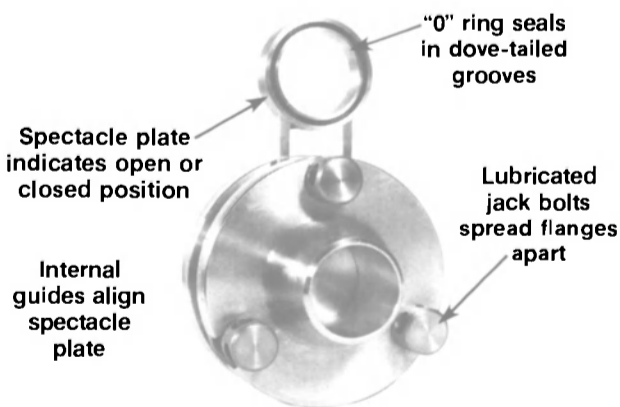
MR 13010 2 86

Circle 197 on Reader Service Card

## AMERICAN LINE BLINDS

The most positive dead-tight  
shutoff ever devised

### FORGED STEEL BODIES



- Butt weld or flanged
- All pressures and body materials
- In compliance with regulatory agency requirements

AMERICAN PIPING PRODUCTS, INC.

P.O. Box 1056 New Hyde Park, New York 11040  
516-352-8600

INTL TELEX: 230199 (SWIFT UR) ATT: GSS

DOMESTIC TELEX: 960127 (SWIFT NYK) ATT: GSS

Circle 201 on Reader Service Card

## MARCO OIL SPILL and DEBRIS SKIMMERS



MARCO POLLUTION CONTROL

2300 West Commodore Way • Seattle, WA 98199 USA  
Phone (206) 285-3200 • Telex 160587 MARCO UT

Circle 350 on Reader Service Card



**EG&G Washington Analytical Services Center Incorporated**, Rockville, Md., is being awarded a **\$4,405,000** modification to an existing contract for technical engineering and contract support services for the AN/BQQ-6 sonar and defensive weapon systems of Ohio class submarines. Work will be performed in Rockville, and is expected to be completed September 30, 1986. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-83-C-6077).

**Westinghouse Electric Corporation, Bettis Atomic Power Laboratory**, West Mifflin Borough, Pa., is being awarded a **\$7,676,000** modification to a previously awarded cost-plus-fixed-fee contract for naval nuclear propulsion research and development. Work will be performed in West Mifflin Borough. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-79-C-4026).

**General Dynamics Corporation, Electric Boat Division**, Groton, Conn., is being awarded a **\$15,045,707** cost-plus-fixed-fee contract for planning yard services for Trident submarines. Work will be performed in Groton, and is expected to be completed September 30, 1986. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-2002).

#### August 1

**General Electric Company, Mechanical Drive Turbine Products Department**, Fitchburg, Mass., is being awarded a **\$44,891,201** modification definitizing a previously awarded contract for ship service turbine generator sets for SSN-688 class submarines. Work will be performed in Fitchburg, and is expected to be completed in April 1988. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-4070).

**General Dynamics Corporation, Pomona Division**, Pomona, Calif. is being awarded a **\$12,894,483** cost-plus-fixed-fee contract for design agent services for MK-15 Phalanx Close-In-Weapon-Systems (CIWS). Work will be performed in Pomona, and is expected to be completed in August 1987. This contract combines purchases for the U.S. Navy (65.0 percent) and the Strategic Defense Acquisition Fund (1.6 percent), and for Japan (12.7 percent), Taiwan (0.8 percent), Great Britain (16.7 percent), Pakistan (2.4 percent), and Australia (0.8 percent), under the Foreign Military Sales program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-5453).

#### August 4

**Yardney Battery Division**, Pawcatuck, Conn., is being awarded a **\$3,189,773** firm-fixed-price contract for 331 MK-46 Mod 0 batteries and 13 MK-73 Mod 0 gas generators for Navy inventory. Work will be performed in Pawcatuck, and is expected to be completed September 1988. Five bids were solicited and two offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-6056).

#### August 6

**General Dynamics Corporation, Pomona Division**, Pomona, Calif. is being awarded a **\$57,271,329** fixed-price-incentive letter contract for 57 systems of the Phalanx Close-In Weapon System (CIWS). Work will be performed in Pomona, and is expected to be completed September 30, 1988. This contract combines purchases for the U.S. Navy (95 percent), and for Japan (3 percent), and Australia (2 percent), under the Foreign Military Sales program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-5412).

### USCG Crew Refrigeration Plants Supplied By Bailey

The Bailey Refrigeration Co.,

Circle 168 on Reader Service Card →

Inc., was assigned a contract by the U.S. Coast Guard to supply 16 shipsets of complete refrigeration plants. Each shipset was specified and designed to meet all regulatory, space and performance requirements.

The 16 shipsets are for the specific purpose of ship's stores refrigeration to serve the chill, freeze and thaw walk-in refrigeration rooms on board the 210-foot medium endurance cutters being overhauled at Curtis Bay USCG Shipyard, Baltimore, Md.

Each complete shipset included two 3-hp seawater-cooled condensing units mounted on an integral structural steel base; three unit coolers; two seawater pumps; three specially designed electric defrost control cabinets; and shipsets of refrigeration controls, thermometers, pressure gauges, pressure relief

valves, bursting discs, etc. Everything needed for installation and use in engine room spaces on the second deck of each of the 16 cutters was supplied.

For literature containing additional information on all Bailey's air conditioning, refrigeration, ventilation, carpentry and insulation and joiner services and supplies,

Circle 18 on Reader Service Card

SKF

## Suddenly, other hi-torque couplings and fitted bolts are obsolete.

The torque transmission revolution is here. *With SKF couplings* that let you reduce shaft diameter for a given rating by 25%, because they eliminate splines and keyways. They keep shafts firmly together even under shock- or over-loads — yet they mount or dismount in minutes.

*With SKF Supergrip fitted bolts* that go ordinary expansion one better: hand fitted, they grip flanges by expansion and pre-tensioned loads. And they go on or off even more quickly than the couplings.

Both couplings and bolts are proven in ever wider use.

Let us show you a turn for the better in torque transmission: SKF Steel Couplings AB, S-813 00 Hofors, Sweden, Tel. + 46 (0) 290-250 00, Telex 47300, Telecopier + 46 (0) 290/282 70.

**SKF Steel**  
We Build Innovation.

# ASNE/NAVY SYMPOSIUM AND EXHIBITION 1986

## Destroyer, Frigate and Cruiser Technology

**Biloxi, Miss., October 2-4**

A symposium and exhibition jointly sponsored by the Pascagoula Section of the American Society of Naval Engineers and the Navy Supervisor of Shipbuilding, Conversion and Repair-Pascagoula will be held October 2-4 this year in Biloxi, Miss. This is the second such meeting (the first was held in Biloxi in 1982) planned to bring together Navy and industry leaders for an interchange of technical ideas for future ship designs.

This year the exhibitor list has grown to some 60 companies that will display their products and services in the Gulf Coast Coliseum. Papers to be presented at the four symposium sessions will survey the technical developments available for the design of the next class of combatant ships.

The October 2 morning session, to be held at nearby Keesler Air Force Base, will be classified (U.S. Confidential). The other three sessions are unclassified and will be held at the Gulf Coast Coliseum. There will be luncheons on both Thursday and Friday and a banquet on Thursday evening, all with guest speakers. Luncheons will be held at the Coli-

seum and the banquet at the Biloxi Hilton. A wine and cheese party will follow the business session on Thursday afternoon. On Saturday, October 4, a tour of Ingalls Shipbuilding in Pascagoula will be conducted for those interested, with bus transportation provided.

### Symposium Agenda Thursday, October 2

Moderator: **Dr. Reuven Leopold**

8:30 am—"Structural Survivability of Surface Ships," by **Alexander Malakhoff, Stephen G. Arnston, and Robert Sielski**

9:15 am—"Developments in Ship Survivability Analysis," by **Dean Rains and John Johnson**

10:00 am—"Combat Systems for the Nineties," by **Richard Logan**

10:45 am—"A Modular Aviation Facility for a Variable Payload Destroyer," by **Joseph Rippman**

Noon—Luncheon  
Speaker: Rear Adm. **John F. Shaw**, USN, Aegis Shipbuilding Project Manager, NAVSEA

### Afternoon Session Moderator: **Ronald D'Arcy**

2:00 pm—"The Methodology for Implementing Innovative Technology in DDG-51," by **Cdr. James E. Baskerville, USN, and Cdr. William R. Schmidt, USN**

2:45 pm—"The Impact of a Deep Vee Hull Form on the Design and Performance of Frigates," by **Erbil H. Serter, Capt. J.W. Kehoe, USN (Ret.), and Kenneth S. Brower**

3:30 pm—"TOTS (Take Off Tons Sensibly) Experience on the CG-47 Class Ships," by **Martin Fitzgerald and Arun Mehta**

4:15 pm—"The Canadian Patrol Frigate: Today's Technology," by **Capt. R.A. Sutherland, CF(N), Cdr. L.P. Dumbrille, CF(N), and Cdr. M.A. Stenson, CF(N)**

5:00 pm—Wine and Cheese Party

8:00 pm—Banquet at Biloxi Hilton Hotel

Keynote Address: Hon. **Everett Pyatt**, Assistant Secretary of the Navy (Shipbuilding and Logistics)

### Friday, October 3

Moderator: **Capt. Clark Graham, USN**

8:30 am—"Machinery for Future Surface Combatants," by **Timothy J. Doyle, Raymond W. Kornbau and Arthur L. Smookler**

9:15 am—"The Type 23 Frigate: the 'Duke' Class," by **Cdr. Richard Meryon, RN, and Cdr. D. Pattison, RN**

10:00 am—"Simplification of Gas Turbine Intake Anti-Ice Systems," by **Arthur G. Killinger**

10:45 am—"Analysis of 400 Hz Shipboard Electrical Power Systems and Impact of Current Limiting Devices," by **G. Babcock, T.K. Huber and L.F. Rogers**

Noon—luncheon  
Speaker: **Gerard C. Hoffman**, U.S. Navy specification control advocate

### Afternoon Session

Moderator: **Peter Gale**

2:00 pm—"Hull Form Development and Hydrodynamic Performance Analysis of Surface Combatants," by **Jeffrey Hough and William Sandberg**

2:45 pm—"Effects of Low Frequency Motion on Human Performance at Sea," by **Jay G. Pollack, Kim Wilson and Marie Wallick**

3:30 pm—"NFR-90: International Industrial Aspects," by **Robert S. Johnson**

4:15 pm—"Ship Arrangements Configuration Management," by **H.E. (Rick) Wolff Jr.**

5:00 pm—Adjournment of Symposium

### ASNE EXHIBITORS

Company	Booth No.
ADVANCED STRUCTURES	34-35
ALLISON GAS TURBINE, GM	63-64
ALS CORPORATION	L-4
AMERICAN METAL BEARING	L-2
ASTECH	92-93
BATH IRON WORKS	30
CDI MARINE	88
CIRCLE SEAL CONTROLS	24
CLA-VAL	32
CONTROLMATICS	68
CRANE RESISTOFLEX	44
DAVID TAYLOR NSRDC	104-5
DECISION ENGINEERING	L-3
DEUTSCH METAL COMPONENTS	16
ENGINEERING VISIONS	52
ENVIROVAC	9
GAYLORD INDUSTRIES	65
GENERAL ELECTRIC	ABCD
GUIDANCE & CONTROL SYSTEMS	13
HENSCHEL	69
HEXCEL	14
HILLER SYSTEMS	1
INGALLS SHIPBUILDING	37-39
INGERSOLL-RAND	12
JERED BROWN BROTHERS	60
J.J. McMULLEN ASSOCIATES	36
KAMATICS	8
LEE ASSOCIATES MID-SOUTH	2
LIQUID DEVELOPMENT	31
LOCKHEED SHIPBUILDING	33
LONSEAL	53
LUBRIQUIP-HOUDAILLE	23
MARINE MACHINERY ASSOCIATION	L-1
MAROTTA	56-57
METCO	66
MISSISSIPPI STATE UNIVERSITY	62
MORGAN ACTUATOR	17
MUESCO	75
NAVAL ORDNANCE STATION	86
NAVY TECHNOLOGY TRANSFER FACT SHEET	85
NELSON ELECTRIC	10-11
NORDA	103
NSWC	87
PIEZO	70
PRC	40
RAYCHEM	6-7
RCA/MSRD	25-27
SEAWARD MARINE SERVICES	95
SPERRY	50-51
SSS CLUTCH	28
STEWART & STEVENSON	98-99
SYSTEMS ENGINEERING	22
TODD PACIFIC SHIPYARDS	102
TRANSAMERICA DELAVAL	15
TRI-TOOL	55
UNIVERSITY OF NEW ORLEANS	106
VAC-HYDE	54
VSE CORPORATION	76
WESTINGHOUSE ELECTRIC	3-3A
YOUNG ENGINEERING	4-5



Aegis cruiser USS Valley Forge (CG-50) on sea trials.





**TAN/TBN to go.**

**Anywhere.**

**Fisher's unique  
CAT TAN/TBN  
System**

**It's everything you need for TAN/TBN analyses, in one convenient package.** At one very affordable price. And we mean everything: beakers, balance, bottles, standards, solvents, reagents, supplies and more. Right down to the disposable wipers to clean up spills on your lab bench (if you happen to have one). Packed and ready to go anywhere you need it.

**Plus, of course, Fisher's unequalled Computer-Aided Titrimeter® System.** In a version that's programmed for fast, convenient determination of total acid numbers (by the ASTM D-664 method). And total base numbers (by the ASTM D-2896 method, us-



ing either forward or back titration).

**Fisher's CAT TAN/TBN System is exceptionally easy to use, too.** Because we've put the whole complex methodology of TAN/TBN analyses into a couple of computer chips. So, no programming experience is needed — just touch a button to select the procedure. The rest is automatic.

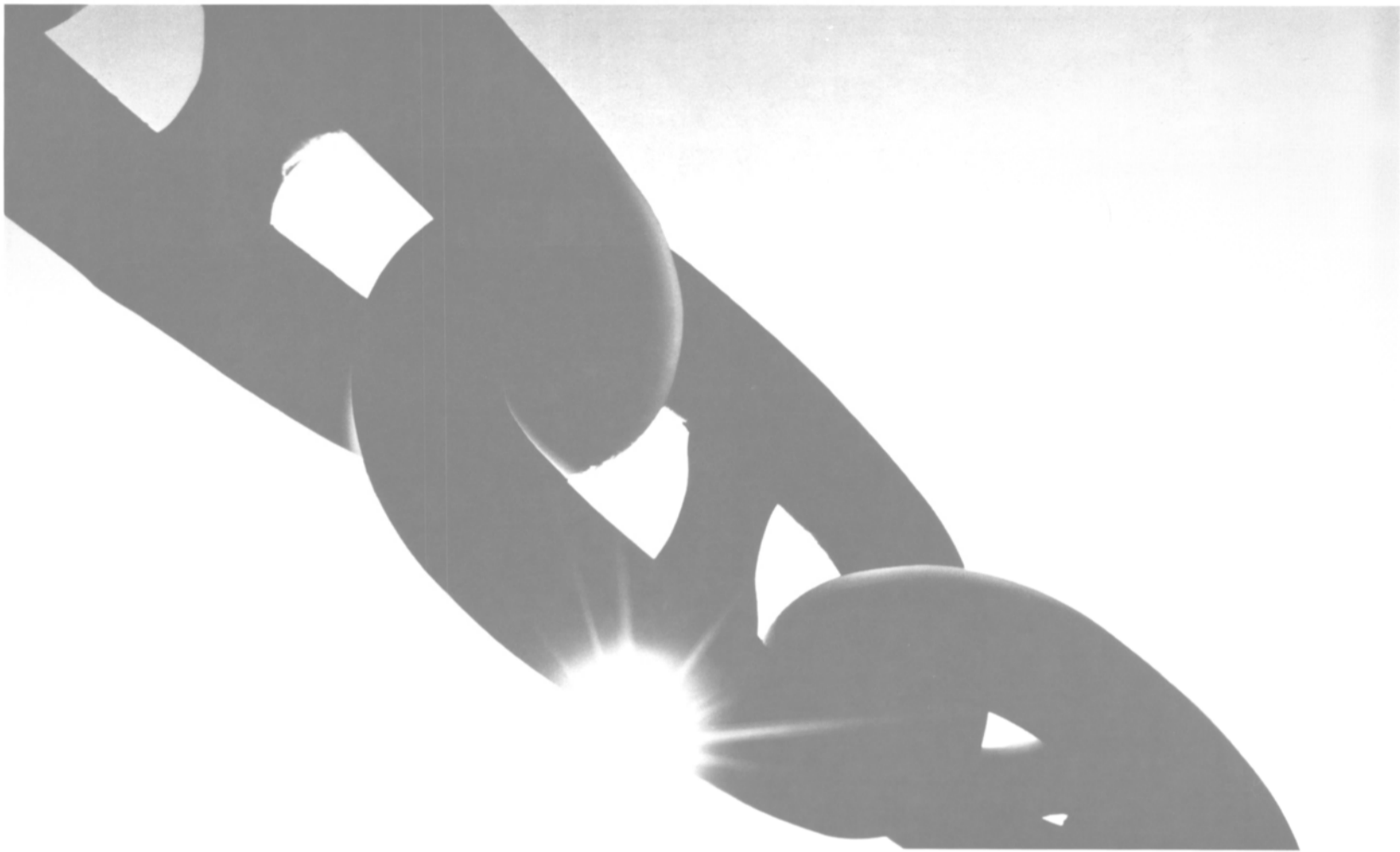
**It's a system only Fisher could put together.** And we did it with the aid and advice of some of the top brass in petroleum technology. To bring you a package that's tailored precisely to the requirements of people who need to check their oil in a BIG way.

**Want to know more?** For literature, or for a demonstration, write to: Fisher Scientific, 711 Forbes Avenue, Pittsburgh, PA 15219. Or call us at (412) 562-8543 for a quick reply.



**Fisher  
Scientific**

# THE MISSING LINK IN SHIP ENGINEERING



Whatever your needs . . .

- **Project related engineering services for construction or conversion.**
- **Advisory services for productivity improvement. Including CAD/CAM systems.**
- **Design and development of hulls. Model tank testing.**
- **Analysis services on a wide range of constructions including:**
  - **Ships • Offshore structures**
  - **Pressure vessels • Bridges • Water-gates and penstocks • Steel skeletons and stacks**
  - **Pipes and others.**

. . . we can fill them.

Backed up by:

Our considerable expertise in every aspect related to shipbuilding.

The wide scope of the company's facilities and construction technology.

A century of experience.

And the satisfaction that you've linked up with one of the world's premier and technically innovative ship designers, builders, and consultants.

*We build industries*

## **Hitachi Zosen**

HITACHI ZOSEN CORPORATION

HITACHI ZOSEN INTERNATIONAL, S.A.: London: Winchester House, 77 London Wall, London EC2N 1BQ, England Phone: 01-628-3891/8 Telex: 887873, 884009

HITACHI ZOSEN U.S.A. LTD.: Head Office: 150 East 52nd Street, New York, N.Y. 10022, U.S.A. Phone: 212-355-5650 Telex: 232063 Houston: Suite 3080, Citicorp Center, 1200 Smith Street, Houston, Texas 77002, U.S.A. Phone: 713-658-0136/8 Telex: 775038, 6868224, 203134

HITACHI ZOSEN CORPORATION: Tokyo: 1-1-1 Hitotsubashi, Chiyoda-ku, Tokyo 100, Japan Phone: 03-213-6611 Telex: J24490 OVERSEAS OFFICES & SUBSIDIARIES: Oslo: Raadhusgaten 4, Oslo 1, Norway Phone: 2-41 12 75 Telex: 76934 Dusseldorf: Graf Adolf Strasse 24, D-4000 Dusseldorf 1, West Germany Phone: 0211-133011~4 Telex: 8587231 Beijing: Room No. 6087, Beijing Hotel, Dong Chang An Jie, Beijing, The People's Republic of China Phone: 500-7766 Ext. 6087 Telex: 22519 Kuala Lumpur: Lot 1103, 11th floor WISMA MPI, Jalan Raja Chulan, Kuala Lumpur, Malaysia Phone: 03-248-8382, 8431 Telex: 20154 Jakarta: Wisma Antara, 14th floor Jalan Medan Merdeka Selatan 17, Jakarta, Indonesia Phone: 21-345948/345943 Telex: 44496 Hitachi Zosen Engineering Singapore (Pte.) Ltd.: UOB Building, 325 Boon Lay Place, Jurong, Singapore Phone: 2641344 Telex: RS21999 Hitachi Zosen Company (HK) Limited: Room 1008/1009, Tak Shing House, 20 Des Voeux Road, Central, Hong Kong Phone: 5-220597, 5-246237 Telex: 73648 Hitachi Zosen Industria Pesada Ltda.: Rua Mexico, 90-Grupo 610-Rio de Janeiro, RJ, Brazil Phone: 021-240-9047/240-9098 Telex: 2122904 Permint Hitachi Zosen Sdn. Bhd.: Kawasan Perindustrian Kerteh Kerteh, Kemaman, Terengganu, Malaysia Phone: 09-871777/871786 Telex: 51489

## Imperial And Parkway Consolidate Operations

Imperial, leading manufacturer of survival suits and equipment, has moved its manufacturing and administrative offices from Bremer-ton, Wash., to the South Amboy, N.J., headquarters of its parent company, Parkway Fabricators, Inc. Parkway, a Great American Industries Company, purchased Imperial 16 months ago.

"Consolidation of our manufacturing operations will increase cost efficiencies and strengthen our product development capabilities as we combine the best technologies of both companies," said **Frank Sanger**, president of Parkway/Imperial.

"**David Stancil**, who has done a tremendous management job for Imperial over the past year, will continue to serve our sales efforts as Imperial's West Coast sales manager," Mr. **Sanger** said.

Celebrating its 13th anniversary this year, Imperial is the largest producer of survival suits in the United States, and has worked with various governing bodies, including the U.S. Coast Guard and Underwriters Laboratories, in testing and developing safe standards for 15 years. Imperial is the only U.S. manufacturer of these suits to pass Norwegian Maritime Directorate standards, known to be the most stringent in the world.

For free literature describing Parkway and Imperial products and services,

Circle 8 on Reader Service Card

## Moore McCormack Plans Sale Of Its Two Bulk Shipping Subsidiaries

Moore McCormack Resources, Inc. of Stamford, Conn., has announced its intention to divest itself of Interlake Steamship Company and Moore McCormack Bulk Transport. The Interlake fleet consists of 10 Great Lakes bulk carriers, mostly self-unloaders; Bulk Transport owns three 39,000-dwt tankers delivered by National Steel and Shipbuilding in 1975-77 for oceangoing service.

The move brings to an end the company's long involvement in the U.S. shipping industry. Its subsidized liner service, Moore McCormack Lines, was sold in 1983 to McLean Industries, Inc., parent company of United States Lines. At the time of its sale, Mormac Lines operated a fleet of 13 cargo ships on trade routes to South America and Africa.

Another wholly owned subsidiary, Moore McCormack LNG Transport, Inc., recently sold all of the stock of Morgas, Inc. to Panhandle Eastern Corporation, for \$45 million in cash, thereby ending its investment in LNG transportation. The primary asset of Morgas is a 20-percent interest in Lachmar Shipping, a partnership that owns two 125,000-cubic-foot LNG tankers, the Lake Charles and the Louisiana, delivered by the Quincy shipyard of General Dynamics in 1980.

## 'Financial Times' To Issue Survey On World Ports

On September 26, 1986, the *Financial Times* will publish a four-page survey on International Ports.

The survey will look at the rapid pace of innovation the ports have had to maintain to meet growing demands, and will consider recent major investment in fast and efficient ways of handling cargo and passengers as the ports compete for

trade.

Elsewhere the survey will look at the equipment the major ports have been buying to cope with rapidly changing maritime needs.

Abroad, the survey will ask which are the leading ports in the container sector in Europe, the Far East and North America and how are they developing? Latest handling methods for bulk cargoes and the developments in gas and oil handling will be assessed.

Ports have traditionally been cen-

ters of organized labor, but changing methods and financial pressures have meant cutbacks and confrontation: the survey will consider the impact worldwide, and will profile selected key ports around the world in the major shipping and cargo sectors.

The *Financial Times* publishes more than 250 surveys each year which look at a wide range of topics of interest to the business community, including countries, regions and specific industries.

# CUMMINS MARINE GENERATOR SETS... 37-925 kW

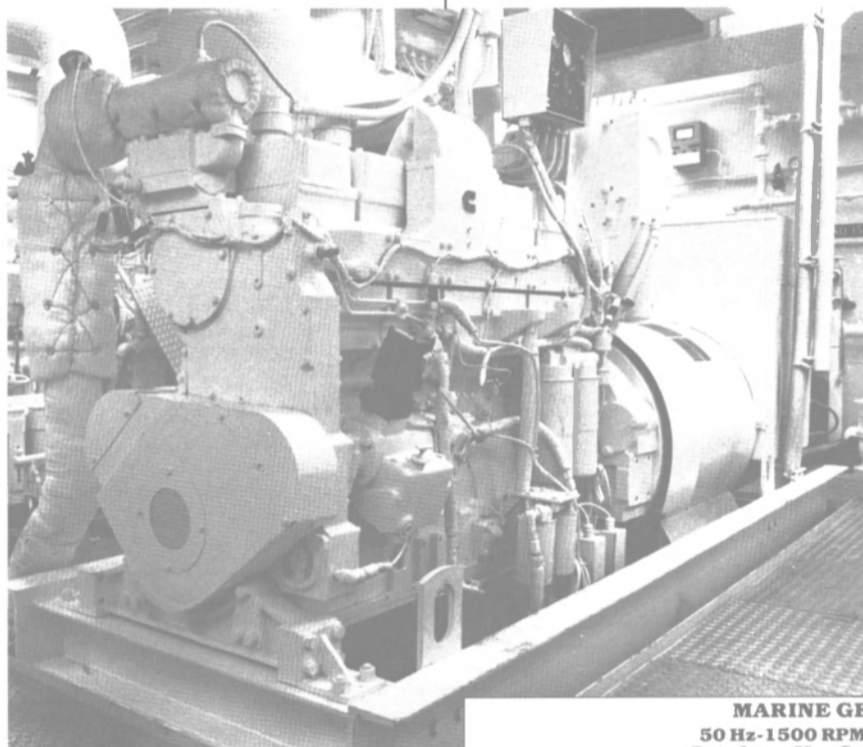
Cummins offers a complete line of marine generator sets designed for performance, reliability and durability in a broad range of 37 to 925 kW. And, with Cummins

you always get high quality, on-time delivery, and fast, dependable service.

Cummins marine generator sets are available with heat exchanger, radiator, keel or remote cooling. Other available optional equipment includes: base rails, isolators, mufflers, electric or air starting, engine control panel, generator control panel, manual or automatic paralleling, alarm system, and Cummins EFC, American Bosch or Woodward governors.

Cummins generator sets are available with Marine Agency Certification. For specific agency approved ratings, contact Cummins Engine Company.

Cummins has more than 300 Marine Distributors and branches located in over 160 countries. The Cummins Distributor can provide complete technical and pricing information on Cummins shipboard generator sets, or you may write: Cummins Marine Generator Sets, Cummins Engine Company, Inc., Box 3005, MC 60403, Columbus, IN 47202-3005, U.S.A.



### MARINE GENERATOR SETS

Model	50 Hz-1500 RPM		60 Hz-1800 RPM		Weight kg. (lbs.)
	Rated BHP	Max Cont.* kW	Rated BHP	Max Cont.* kW	
4B3.9G/GC	52	33	61	37	658 (1450)
4BT3.9G/GC	71	40	82	50	687 (1514)
6B5.9G/GC	90	45	97	55	835 (1840)
6BT5.9G/GC	113	65	134	72	865 (1905)
N-855G/GC	160	110	195	125	2295 (5055)
NT-855G/GC-2	265	175	320	215	2586 (5695)
NT-855G/GC-3	310	205	355	235	2651 (5840)
NTA-855G/GC	322	215	385	260	2747 (6050)
NTTA-855G/GC-1	380	255	420	285	2851 (6280)
KT19-G/GC	380	255	420	285	3330 (7335)
KTA19-G/GC-1	425	285	505	335	3487 (7680)
KTA19-G/GC-2	450	355	525	360	3575 (7875)
VT28-G/GC	530	360	620	420	5008 (11030)
VTA28-G/GC-1	614	410	690	465	5471 (12050)
VTA28-G/GC-2	614	410	750	510	5650 (12445)
VTA28-G/GC-3	745	510	—	—	5766 (12700)
KT38-G/GC	750	515	910	625	7377 (16250)
KTA38-G/GC-1	850	575	1030	700	7416 (16335)
KTA38-G/GC-2	890	615	1085	750	7872 (17340)
KTA50-G/GC-1	1180	815	1350	925	8989 (19800)

\*0.8 Power factor. KW rating may vary depending on voltage required. Ratings shown are approved by the various marine agencies.



©Cummins Engine Company, Inc.



**NOBODY KNOWS DIESELS BETTER**

Circle 320 on Reader Service Card



**ADVERTISE TO THOUSANDS MORE BUYING-**

**MARITIME RE**

**BI  
ANNI  
S.N.A.M.  
ISSI**

NOVEMBER 19

INCLUDING BONUS DIS

**5th S.N.A.M.E. |  
MARITIME |**

"THE MOST SUCCESSFUL AND PRODUCTIVE M

**THESE ARE THE MARINE / OFFSHORE BUYERS**

MARITIME REPORTER has a circulation to marine buyers . . . titles listed below . . . thousands larger than any other magazine in the entire world . . . over twice the No. 2 publication.

**VESSEL OPERATING COMPANIES, OCEAN, INLAND, HARBORS, OFFSHORE OIL DRILLING, PORT AUTHORITIES:** (includes oil companies involved in offshore drilling, offshore drilling contractors and crew/supply boat companies).

(Owners, Agencies and brokers) Companies, directors, owners, agents, presidents, vice-presidents, managers, secretaries and treasurers, port engineers, superintendents, purchasing agents, port captains, port stewards, naval architects and engineers shoreside.

**SHIPBUILDING, BOATBUILDING, DRILL RIG BUILDING & REPAIR COMPANIES:**

(Commercial, U.S. Navy and Coast Guard): Companies, directors, owners, presidents, vice presidents, secretaries, treasurers, superintendents, managers and purchasing agents, naval architects and chief draftsmen.

**PROFESSIONAL MEN:**

Naval Architects, engineers and consultants shoreside.

ADVERTISING COPY CLOSING DATE FOR

**RESERVE ADVERTISING SPACE NOW . . .  
TAKE ADVANTAGE OF THE TREMENDOUS READER II**

FLUENCE READERS WORLDWIDE IN . . .

PORTER'S



JAL  
E. '86  
JE



16 ISSUE

DISTRIBUTION AT THE

# INTERNATIONAL EXPOSITION

MARITIME EXPOSITION IN DECADES"

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

Previous S.N.A.M.E. Expositions have been resounding successes. All exhibit space was completely booked at an extremely early date and attendance exceeded all expectations. This fifth annual combination technical symposium and exposition is also booked to capacity with far more exhibits than last year and attendance is certain to exceed that of 1985.

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

The November special issue will be mailed to MARITIME REPORTER'S entire readership before the conference takes place . . . plus . . . it will receive extra distribution at S.N.A.M.E. in New York.

The November special issue is traditionally one of MR's largest and best-read issues. It provides all marine advertisers with an unequalled opportunity to deliver their sales message to the world's largest audience of marine management readers . . . both in their offices . . . and at this fifth S.N.A.M.E. annual . . . which has firmly established itself as the premier maritime industry exposition.

THE NOVEMBER ISSUE IS OCTOBER 10th.

INTEREST THIS NOVEMBER SPECIAL WILL GENERATE.

## ONLY MARITIME REPORTER GIVES YOUR ADVERTISING THESE POWERFUL SALES-BUILDING ADVANTAGES

- **WORLD'S LARGEST** circulation to buying-influence readers.
- **LARGEST U.S.** circulation to buyers
- **LARGEST INLAND / OFFSHORE** (Shallow-draft) circulation to buyers.
- **100% REQUESTED CIRCULATION** . . . in writing . . . by each individual reader.
- **MOST CURRENT CIRCULATION** . . . MR's total circulation is 100% qualified . . . currently . . . all in less than 1 year and 2 years.
- **CIRCULATION TO PEOPLE** Total Circulation Address Analysis . . . 100% addressed to individual people . . . by name and title.
- **CURRENT EDITORIAL** . . . MR publishes latest information first.
- **BEST READ** because it is CURRENT.
- **UNEQUALLED PASS-ALONG READERSHIP** . . . 5 readers per single copy . . . over 137,000+ monthly readership.
- **FREE READER SERVICE CARD**
- **EXCLUSIVE FREE LISTING** for regular advertisers in Buyers Directory section of each issue for one entire year.
- **DIRECT MAIL SERVICE**
- **DIRECT RESPONSE CARD MAILINGS**
- **ANNUAL YEARBOOK ISSUE**
- **ANNUAL MARINE CATALOG**



**MARITIME REPORTER/Engineering News**  
118 East 25th Street, New York, NY 10010  
(212) 477-6700

**THE ADVERTISING LEADER** in 1985, a larger number of advertisers placed more pages of advertising in Maritime Reporter than in the No. 2 magazine.

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



Excursion/fishing vessel Nautilus II built by Westport Shipyard is powered by twin Detroit Diesel 12V92N engines with total output of 1,020 bhp for top speed of 21 knots.

## Westport Yard Delivers Multipurpose Fiberglass Excursion/Fishing Vessel

The fiberglass excursion and charter fishing vessel Nautilus II was completed recently by Westport Shipbuilding, Inc. of Westport, Wash., and delivered to Meatball Bait Company of San Francisco. Designed by naval architect **Jack Sarin** of Bainbridge Island, the 75-foot boat will be used by owner **Jim**

**Williams** for both day excursions and charter fishing, as well as whale-watching trips. She is certified by the U.S. Coast Guard to carry 75 passengers, but has sleeping bunks for 34 people plus the operating crew to be used on overnight trips. Extensive owner-furnished galley equipment was installed, and

a broad range of electronics gear equips the vessel for offshore operations.

The hull is built of Airex foam cored fiberglass; the resin used is of fire-resistant composition, in keeping with the boat's mission as a passenger vessel. Westport also molded the fiberglass house shell for above-deck accommodations.

The Nautilus II is propelled by two 510-bhp Detroit Diesel 12V92N engines, driving Coolidge three-bladed bronze propellers via Twin Disc 514 2.5:1 reduction and Aquamet shafts. The 3-inch shafting was machined by Alaskan Copper & Brass of Seattle. This propulsion plant gives the boat a cruising speed of 18 knots at 1,700 engine rpm, and a top speed of 21 knots.

Morse Twin S propulsion controls were supplied by Englund Marine of Westport. The engine spaces are protected by a Halon fire-suppressing system from Automatic Sprinkler of Pasadena, Calif. Other safety equipment includes a Marlow fire pump from Cascade Machinery, Seattle; fire hoses and rack from Safety & Supply, Seattle, and life-saving gear from Cal-June of North Hollywood, Calif.

The vessel's electronics gear, supplied by Baytronics of Oakland, Calif., features a number of Raytheon units, including a Model 1010 64-mile radar, JFV-516 video sounder, JFV-760 sounder recorder, Rayfax 500 facsimile, Raynav 750 MKII Loran C, Ray-150 SSB radio, Ray-400 loudhailer, and NWU-52R video plotter. Other electronics equipment includes a King 7200 VHF, Regency Polaris ADF-VHF, Combi CS-3001 stereo, Dytek 200 C/F sea-temp indicator, Bearcat 210XK radio channel scanner, RDI Bridge Master watch alert, RCA sidetrack television, and Mitsubishi VCT.

Two 20-kw Northern Lights generators from Alaska Diesel Electric of Seattle supply electrical power. Deck gear includes a Smith Brothers winch from Englund Marine, and dock lines and fenders from Fisheries Supply of Seattle. The anodized aluminum windows with tinted glass were supplied by Peninsula Glass of Vancouver, Wash.

For further information and free color brochure describing Westport Shipbuilding's facilities and capabilities,

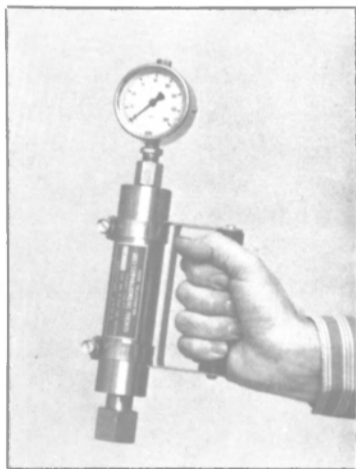
Circle 21 on Reader Service Card

## FOR DIESEL ENGINES BMEP BALANCER MODEL 300-A

STEADY • ACCURATE • REPEATABLE • RELIABLE

### SPECIAL FEATURES

- Attaches to standard indicator valve.
- Completely passive system thoroughly reliable for extended service.
- Balances load distribution in a multicylinder engine with precision and ease.
- Reading of pressure gauge gives index of power developed in cylinder.
- Fuel rack can be adjusted up or down while watching gauge move to desired setting.
- Results in a smooth running, efficient engine that sounds right.
- Rugged construction of stainless steel, yet light in weight.
- Requires no maintenance.
- May be used to indicate engine loading for a remote installation having calibration chart for engine. Reading needs no correction for ambient temperature or altitude.



EASY TO USE

FOR IMMEDIATE INFORMATION CONTACT.

Joseph Leto (617) 746-0200

**General Thermodynamics Corporation**

P.O. Box 1105, 210 South Meadow Road, Plymouth, MA 02360

Circle 105 on Reader Service Card

## NEW! *Windjammer* puts fresh air anywhere you want it

### Portable centrifugal ventilation fans from Robinson are designed for maritime maintenance requirements

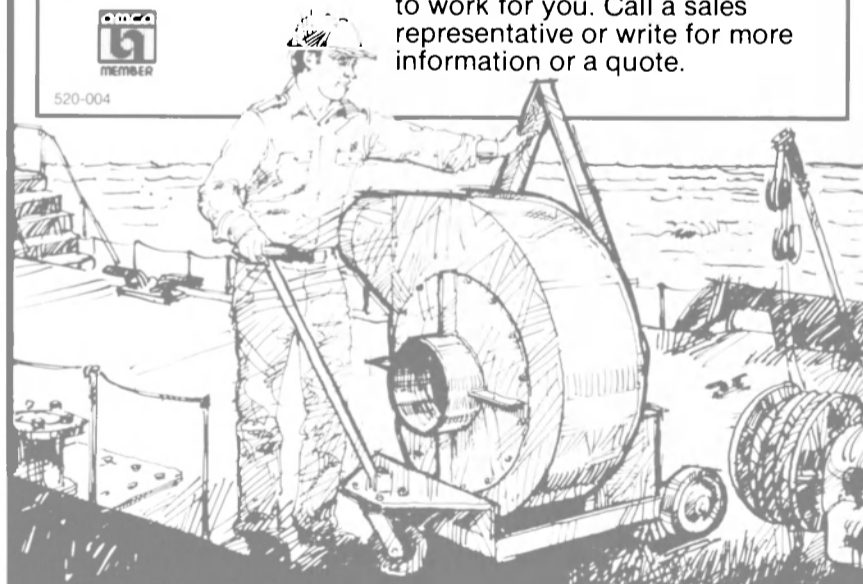
These competitively priced, all-aluminum fans provide exhaust or ventilation for welding and other maintenance needs. Noncorrosive and lightweight, they can be easily rolled into position anywhere.

Windjammer portable fans are available in standard five- and ten-hp units — or we'll design and build to your specifications.

Robinson has been a leader in the fan application industry for more than ninety years. Put our experience to work for you. Call a sales representative or write for more information or a quote.



520-004



# ROBINSON

INDUSTRIES, INC.

P.O. Box 100 • Zelienople, PA 16063 • (412) 452-6121

Circle 270 on Reader Service Card





Passenger ship Kelimutu built for Indonesia by Meyer Werft is powered by MaK diesels.

## Meyer Werft Delivers Fifth Passenger Ship Built For Indonesia

Meyer Werft of Papenburg, West Germany, recently delivered to the Directorate General of Sea Communication of the Republic of Indonesia the Kelimutu, the fifth passenger vessel built by this yard for Indonesia during the past three years.

During the delivery ceremony held at the shipyard the Indonesian Ambassador in Bonn, **Ashadi Tjahjadi**, accepted delivery on behalf of his government in the presence of some 200 guests from Indonesia. A sister ship, the Lawit, is scheduled to be delivered this month. The double launching of these two vessels earlier this year was the first of its kind in the history of Meyer Werft.

These twin-screw vessels of about 5,700 grt have a cruising range of 4,000 miles plus seven harbor days at a speed of 14 knots. They will be employed in the Indonesian inter-island service.

The Kelimutu has an overall length of 327.4 feet, beam of 59 feet, depth to weather deck of 30.8 feet, and draft of about 13.8 feet. Propulsion is provided by twin 4-stroke, MaK diesel engines, each with an output of 2,176 bhp at 600 rpm, driving fixed-pitch propellers via reduction gears. Maneuverability is enhanced by a bow thruster with controllable-pitch propeller and a thrust of about 7.20 tons, driven by a 653-bhp engine.

Electrical power is provided by four diesel generator sets with a capacity of 525 kva each, and one

emergency generator rated 210 kva. The air conditioning and other ventilation plants meet the requirements of the proposed service.

For the safety of the 920 passengers and the crew, eight motor lifeboats and 20 life rafts with a total capacity of 756 and 500 persons, respectively, are provided on board, meeting the highest requirements of SOLAS 1974.

The ship is divided into four fire zones. A smoke- and fire-detecting system is installed in the machinery spaces, cargo holds, and air conditioning rooms. A CO<sub>2</sub> firefighting system is provided in the engine rooms and cargo holds, while a sprinkler system is fitted in all other areas of the vessel. All fire alarms are connected to a central system located on the bridge, with optical and acoustical indications.

The ship is divided into 11 watertight compartments, with all watertight doors closed and opened electrohydraulically from the bridge, and hand-hydraulically from above the bulkhead deck and both sides of the doors.

The Kelimutu and the Lawit were built in compliance with the regulations of the Indonesian classification society KI and under survey of Germanischer Lloyd to the class +A100 A4 Passenger Ship +MC AUT.

For information about the facilities and capabilities of Meyer Werft,

Circle 22 on Reader Service Card

## Sperry Joins With Marine Management To Offer Total Computing System

Sperry has joined with Marine Management Systems, Inc. (MMS) of Stamford, Conn., to offer the marine industry a total ship management capability.

Sperry recently introduced a ruggedized version of its Personal Computer to augment its line of shipboard electronics and communications equipment. The Sperry Marine Computer is offered with MMS' ship management software systems, providing applications in the areas of spare parts inventory management, planned maintenance,

fleet payroll/personnel management, and cargo loading. This integrated approach will provide owners and operators with an automated package to increase management efficiency and reduce operating costs.

**C.R. Kenny**, vice president of marketing for Sperry, stated, "This cooperation of the two companies will enhance Sperry's ability to provide total solutions for ship management to the marine community."

MMS has been providing computerized management information systems since 1969, dealing exclusively with shipboard and shoreside application systems and management consulting. "Our joining with Sperry will better position MMS to meet the needs of the industry," said **Donald F. Logan Jr.**, vice

president of microsystems, "combining our position as a leader in marine computer systems with Sperry's 76 years of marine navigation and communications manufacturing and worldwide service."

The MMS systems are supported through its corporate headquarters in Stamford, as well as through the Marine Management Center, a London-based joint venture of MMS and BP Shipping, Ltd.

For free literature on the Sperry/MMS total marine computing sys-

tem with state-of-the-art software solutions,

Circle 46 on Reader Service Card

## Godwin Gets Reagan Nod As Under Secretary in DoD

**Richard P. Godwin**, president of Bechtel Civil and Minerals, Inc. of San Francisco, has been nominated by President **Reagan** to be Under Secretary of Defense for Acquisition.

## Expect Faultless Performance From American Made WCS Release Hooks

WCS Electric Hydraulic Release Hooks, manufactured with heat treated American steel, are a positive, labor saving method for mooring or towing. Each hook has a safety locking device that can be operated manually or by remote control with either pneumatic or electric hydraulic release. The hooks can be radio controlled from a distant location.



WCS Hydraulic Release Hook

The hook can swing 180° horizontally and 45° vertically. Available in single, double, triple and quad mountings in 25, 50, 60, 80, 100 and 150 ton capacities. They are proof tested to 1.6 times their rated capacity.

WCS Release Hooks are explosion proof and are U.L. approved. A.B.S. certification can be requested.

Illustrated Catalogue and Brochures are Available.



### Washington Chain and Supply, Inc.

2901 Utah Ave. South  
P.O. Box 3645, Seattle, WA 98124  
(206) 623-8500  
CALL TOLL FREE  
1-800-851-3429  
(Washington State Only) 1-800-543-1304

Circle 227 on Reader Service Card

## Pacific Marine Ship Repair Leases Yard In Reedsport

Pacific Marine Ship Repair, Inc. (PMSR) has announced it has recently leased its first shipyard in Reedsport, Ore.

Since beginning in business four years ago, the repair firm has overhauled a number of U.S. Coast Guard cutters, NOAA vessels and constructed a 44-foot aluminum

catamaran for the Memphis Tennessee District U.S. Army Corps of Engineers.

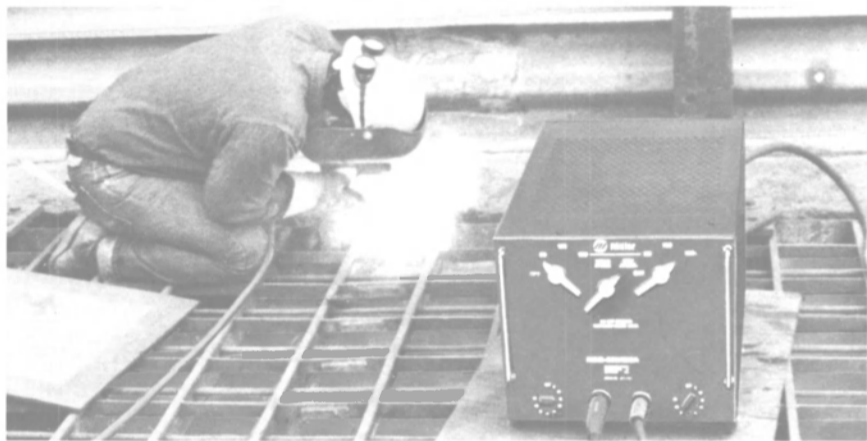
PMSR is currently in the process of doing a complete overhaul on its first Naval vessel, the USS Conquest (MSO-488), a 172-foot minesweeper.

The general manager of PMSR is **B.L. Robertson III.**

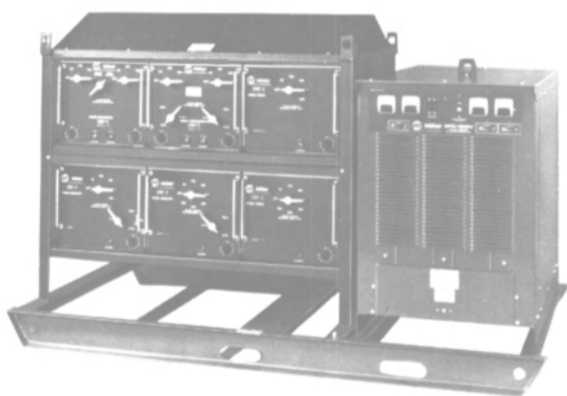
For free literature on the services offered by PMSR,

Circle 94 on Reader Service Card

## Flexible welding system for numerous welding operators ...



## Multiple operator "grids".



Low initial cost per arc... low maintenance cost... and on-site portability are features of the multiple operator "grid" system. It provides power for:

- SMAW (stick electrode)
- GTAW (TIG)
- ACA (air carbon arc cutting & gouging)
- Stress relieving power

GPS power sources are available in 500, 750, 1,000 and 1,500 amp models and can be paralleled. MOG grids, rated 100 percent duty cycle, come in 200, 300, 250/250, and 350/350 amp models with 50 amp coarse range increments and 5 amp fine adjustment in each range.

A complete line of equipment lets you design and install a multiple operator "grid" welding system to meet your particular job requirements. Recommended for... power plant construction and maintenance... shipbuilding and repairing... petrochemical plant building and maintenance... fabrication shops... training facilities.

Ask for the FREE 16 page Multiple Operator Welding Systems guide. Your Miller Distributor is in the Yellow Pages. Or write Miller Electric Mfg. Co., P.O. Box 1079, Appleton, WI 54912.



Circle 221 on Reader Service Card

# PROPULSION UPDATE

## Wärtsilä Diesel Reviews Methods For Re-Engining

—Literature Available—

The revolutionary development of the medium-speed diesel engine with improved total economy, has created an opportunity for the re-engining of many vessels. The main aspects of improved economy offered by medium-speed diesel engines are: capacity to burn heavy fuels of almost any quality at all loads; low fuel consumption at all loads (with an advantage of as much as 15 to 25 g/kwh when compared with older engines); and long overhaul intervals and reduced maintenance costs.

With the development of the medium-speed diesel engine, a number of shipowners became aware of the potential cost-saving advantages of re-engining, and began to re-engine not only older ships, but in some cases, new ones as well.

A few years ago, Wärtsilä Diesel of Finland, one of the leaders in the re-engining market, decided to review its experiences in re-engining projects, and formulate methods for making the process both easy and straightforward for the shipowner.

Wärtsilä found in its review that:

- Operation on heavy fuel is profitable as long as the price difference between heavy fuel and distillate is a few dollars; operation is of course more profitable with a wider price gap. Increased consumption of oil products will probably further widen the gap.

- A detailed feasibility study must precede the decision to re-engine.

- The pay-back time can be calculated from the annual operating costs of the old and new machinery, the estimated re-engining cost, and the capital cost terms. Most shipowners consider re-engining when the pay-back time is in the area of two or three years. Projects carried out by Wärtsilä Diesel to date, have had an average pay-back time of two years.

- Even when the pay-back period is acceptable, a negative cash flow is

not. That is why an important goal of Wärtsilä Diesel has been to show a positive cash flow for every fiscal year.

Wärtsilä Diesel's aim has been to develop the capacity to install one or more new auxiliary engines or alternator sets without taking a ship out of its normal sailing schedule. The idea is that the taking-in of the equipment is preplanned, and performed during a normal stay in port, and the installation of the engine and the systems is performed at sea. The installation work can be simplified by the use of preplanned system modules tailor-made to a particular ship.

However, since main engines cannot be replaced without stopping the ship, reducing off-hire time as much as possible is essential. Pre-planning the change process thoroughly is time-saving. Wärtsilä reports that when the working hours for each stripping level are known, the size of the opening needed to take in the engine can quickly be optimized. A small opening means a little more assembly work on the engine, while a big opening may mean more work on the ship itself.

Wärtsilä Diesel has formulated methods for performing every aspect of re-engining, from feasibility studies to complete projects, and can also work effectively with partners. Feasibility studies are often made by outside consultants, either by a shipowner's appointment or Wärtsilä's request. Wärtsilä also offers supervisory services when a job is performed by other ship service companies or shipyards. Project planning and negotiations with shipyards and equipment suppliers are services which are also offered by Wärtsilä.

For further information, including free detailed literature on Wärtsilä Diesel re-engining services and facilities,

Circle 28 on Reader Service Card

## Lykes Bros. Promotes List And Horn To New Vice President Posts

**Eugene F. McCormack**, president and chief operating officer of Lykes Bros. Steamship Company, New Orleans, has announced the promotion of two officers of the company. **John D. List** has been named senior vice president-finance and chief financial officer, and **Carl J. Horn** has been appointed vice president-planning and analysis.

Mr. **List** joined the company in 1984 as vice president-treasurer, and in February this year was named vice president-finance and chief financial officer. Prior to joining the company he served as vice president and treasurer of Ingram Corporation.

Mr. **Horn** began his Lykes career in 1979 as director of operations and later director of trans-Pacific services at the company's San Francisco office. In 1984 he was named vice president-Far East for Lykes Lines Agency, a wholly owned subsidiary based in Tokyo.

## Todd Shipyards Board Elects Two Top Executives And Reports Profitable Quarter

Todd Shipyards Corporation, headquartered in Jersey City, N.J., recently reported a profitable fiscal 1987 first quarter and the appointment of two Todd executives to top management positions.



John T. Gilbride Jr.

Hans K. Schaefer

Following the retirement of **J.T. Gilbride** chairman and chief executive officer, at a meeting held immediately following the annual shareholders meeting the board elected **Hans K. Schaefer**, chairman and chief executive officer, and **John T. Gilbride Jr.**, president and chief operating officer.

Mr. Gilbride, Todd's chairman since 1975,

told shareholders "the non-recurring events of fiscal 1986, which resulted in a loss for the year, are now behind us." The large increase in sales this quarter compared with last year was attributable to revenues from Todd's recently acquired Aro subsidiary, an international manufacturer of air-powered tools and equipment, he said.

Looking to the future, Mr. Gilbride noted that Todd is "still fully committed to maintaining its leadership in the U.S. shipbuilding industry and is planning to capture an increasing share of future U.S. Navy business."

The company's plans for its second core business, Aro, are equally dynamic, he declared, noting that Todd's objective is to strengthen and improve Aro's worldwide competitive position through implementation of innovative sales, marketing, and manufacturing programs and the application of advanced technologies.

Mr. Schaefer, president and chief operating officer and a director since 1981, joined Todd in 1968 and became vice president and general manager of the Los Angeles Division of Todd Pacific Shipyards Corporation in 1979. **John T. Gilbride Jr.**, a director since 1965 and vice president and general manager of the Seattle Division since 1979, also joined the company in 1968.

Todd Shipyards, one of the nation's leading independent shipbuilding and ship repair companies, operates yards in Seattle, San Francisco, Los Angeles (San Pedro), and Galveston.

## New Intertanko Publication 'Tanker Port Particulars 1986' Is Now Available

Owners, brokers and charterers must know before fixing if the tanker is suitable for the ports concerned. Is the draft satisfactory? Any other restrictions regarding maximum length, beam or otherwise? And not least: what about reception facilities for ballast water and slops?

The second edition of Intertanko's handy *Tanker Port Particulars* was issued in 1982. Intertanko's Port Information Office has now prepared a revised edition. Several additional ports and terminals have been added, and information about ports and terminals has been upgraded. Furthermore, a great deal of additional information is given regarding reception facilities for ballast water, slops etc.

By concentration on ports usually called at by tankers, the publication gives all key information required in a concentrated A4 publication of 80 pages. This makes it an excellent tool for owners, charterers, shipbrokers and, not least, ship masters.

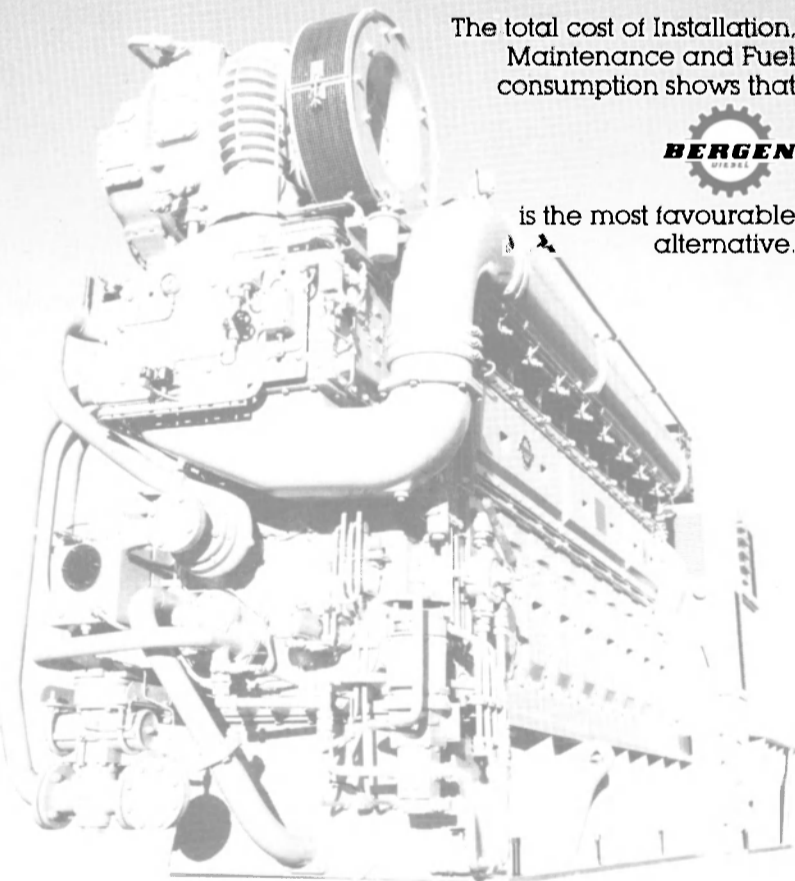
*Tanker Port Particulars 1986* is available from Intertanko, P.O. Box 1452 Vika, N-0116 Oslo 1, Norway. Telex 19751 itank n. Price \$50 for members and subscribers; \$100 for others.

# MOST PROFITABLE DURING LIFETIME!

The total cost of Installation, Maintenance and Fuel consumption shows that



is the most favourable alternative.



**BMV**  
**Bergen Diesel A.S**

P.O. Box 924, N-5001 BERGEN, Norway  
Tel.: (47 5) 19 00 00 - Telex: 41 735 bmvh-n

## FISH/SHRIMP CATCHING, FREEZING AND REFRIGERATION TRAWLER "12961 - 050 - 016"

Fishermen can: trawl for shrimp from both sides;

- catch fish with bottom-drawn, differential-depth and twin trawl-nets;
- dress shrimp and fish;
- store deep-frozen or refrigerated products.



COMPLETE WITH A FISH-SEARCH SYSTEM. COMPLIES WITH INTERNATIONAL CONVENTIONS FOR PREVENTION OF SHIP COLLISION AND PREVENTION OF POLLUTION.

The ship boasts the following features:

Displacement, tons ..... 560  
Refrigerated hold volume, m<sup>3</sup> . 100  
Main engine, kW ..... 588  
Cruising speed, knots ..... 10.6  
Cruising capacity, days ..... 20  
Crew ..... 19

The fish-processing facility offers:

- three-ton under-deck hopper;
- fish-washing machine;
- glazing unit, conveyors;
- two freezers.

**SPECIAL MODELS FOR TROPICAL CLIMATES.**



Supplier: V/O SUDOIMPORT, 10, Uspenski Per., 103006 Moscow, USSR.  
251-05-05; Telephone: 299-02-14; 299-58-77;  
Telex: 411272; 411387; 411443.

# GERMAN MARINE INDUSTRY IN THE NORTH AMERICAN MARKET

## ANSCHUETZ

Circle 61 on Reader Service Card

Anschuetz & Co. GmbH of Kiel-Wik, West Germany, designs and manufactures a comprehensive line of navigation products, including gyrocompasses, autopilots, and steering controls that have been installed on more than 9,000 ships ranging from 500,000-dwt ULCCs to 42-foot motor yachts.

Recently appointed exclusive U.S. distributor for the complete Anschuetz product line is Radio-Holland USA, headquartered in Houston with branch offices in New York, New Orleans, Mobile, Long Beach, and Corpus Christi.

Radio-Holland USA, B.V. offices are in the following locations: **New York**—90 Route 22, Springfield, N.J. 07081, (201) 379-2660, telex 132034; **Houston**—6033 South Loop East, Houston, Texas 77033, (713) 649-1048, telex 795428; **Long Beach**—1965 Spring Street, Long Beach, Calif. 90806, (213) 595-0039, telex 181584; **New Orleans**—5515 Pepsi Street, Suite C, Harahan, La. 70123, (504) 773-4024, telex 784433; **Mobile**—701A South Conception, Mobile, Ala. 36603, (205) 432-3109, telex 782737; and **Corpus Christi**—3206 Reid Drive No. 12A, Corpus Christi, Texas 78404, (512) 851-9390.

## BLOHM + VOSS

Circle 62 on Reader Service Card

Blohm + Voss AG of Hamburg, an integrated engineering and construction group, specializes in the design, building, repair, and conversion of mobile and stationary offshore units for exploration and production, offshore service and construction vessels, topside facilities modules, cargo vessels, special-purpose ships, and floating drydocks. B+V's U.S. operation, Blohm + Voss Company, Inc., is located in Springfield, N.J. The Canadian representative is COM Contractors & Engineers Inc. in Halifax, Nova Scotia.

The B+V product line includes the well-known Stuelckenmast® cargo gear systems, Accommodation System M1000®, tools for oil/gas exploration, and plant and components for energy systems. The company also offers project management, engineering services, consultancy, and system technology for shipyards and industrial plants.

## DEUTZ MWM

Circle 63 on Reader Service Card

Following the acquisition of the majority of the shares of Motoren-

Werke Mannehim AG by Klockner-Humboldt-Deutz AG of Cologne, the engine sales programs for both companies have been coordinated. For marine applications, the new company offers a broad range of medium-speed and high-speed water-cooled engines with outputs of up to 9,722 bhp. New engines in the program are those of Series 234 and Series 604 B.

This merger brings together two of the world's major engine manufacturers, with a combined reputation for quality, durability, and service excellence, serving both North America and the world market. The North American headquarters of the new company is in Montreal, with a division based in Atlanta, Ga.

The Deutz MWM 234 Series represents the state of the art in modern high-power, high-speed diesel engine design in the range of about 135 to 1,210 bhp output. Decisive advances have been made with this development in terms of space/weight ratio, power/weight ratio, fuel consumption, and durability. This series of water-cooled V-type engines with six to 16 cylinders is available in turbocharged versions with charge air cooling and, if required, naturally aspirated. The compact design is said to be a great advantage for the naval architect, allowing greater flexibility and ease of servicing to be achieved with less effort. The power per volume is 552 kw/cubic meter, and the weight to power ratio is 2.1 kg per kw. These advantages make the 234 Series a good choice for several marine applications.

The 604 B engine family, presented for the first time in the spring of 1985, was derived from the 603/604 family. Without changing the outer dimensions, the stroke and bore could be enlarged from 185 to 195 mm and 160 to 170 mm, respectively. This permitted, in combination with a small increase in the mean effective pressure, a 30-percent uprating to a mep of now approximately 18 bar. The maximum power per cylinder was set to 161 bhp at a speed of 1,800 rpm. For main propulsion and auxiliary drive, the engine range includes a 6-cylinder in-line unit and models in 90-degree Vee configuration available as 8-, 12-, and 16-cylinder units that are rated for a maximum power of 2,575 bhp.

The Vee engines have, in the Vee space, exhaust manifolds with insulated sheetmetal covering. Charge air manifolds within the engine outlines, which require no insulation, permit a comparatively narrow construction. The power per unit volume of about 220 kw/cubic meter is correspondingly high.

In the spring this year Deutz MWM filed an application with

Germanischer Lloyd and other leading classifications societies for approval of the TBD 604 B engine family. The firing pressures approved by the societies are well above the maximum levels experienced in field operation. Accordingly, the moving parts of the engines exhibit an adequate safety reserve as well as development potential.

## GRANGES

Circle 64 on Reader Service Card

Granges Repair Service in Hamburg has more than 40 years of experience in crankshaft grinding in its modern workshop and on-site repairs aboard ship, grinding crankshaft pins and main and thrust bearings of diesel engines without dismantlement of the shaft.

The company is a specialist for worn or heavily cracked pistons (aluminum and steel), cylinder covers, valves, guaranteed crack welding, etc. It offers flame-hardened or chrome-plated ring grooves.

Granges provides worldwide service, with all precision grinding, boring, and milling machines packed in air baggage.

## JASTRAM

Circle 65 on Reader Service Card

The Research, Development and Engineering Department of Jastram-Werke GmbH KG in Hamburg offers a free full-color literature package on its facilities and capabilities, and on the services the company provides for a wide range of activities relating to oil recovery and wastewater purification. This includes recovery of oil from accidental spills, harbor cleaning, skimming oil off water surfaces, and separation technology.

Color photographs illustrate activities in connection with oil recovery fields, as well as various products designed and developed by Jastram. One photo shows the turning circle of a highly maneuverable ship fitted with a Jastram T-rudder, which can turn around at full speed in a circle of less than two ship lengths.

The literature package also contains some 12 leaflets that discuss and thoroughly explain, with many illustrations, the Jastram oil recovery and separation process.

Michigan Wheel Company of Grand Rapids, Mich., markets the Michigan-Jastram transverse thruster to the North American market.

## KRUPP ATLAS

Circle 66 on Reader Service Card

A 12-inch AC/TM rasterscan radar designed for either stand-alone or integrated installation aboard all types of small commercial, naval, and fishing vessels, the Atlas 5600 was introduced recently by Krupp Atlas Elektronik (KAE) of Bremen. The German company's U.S. operations are based in Rahway, N.J.

Combining continuous radar presentation and dedicated data display functions on a single 44-cm, high-resolution screen, the 5600 system offers one or more viewers uninterrupted true daylight viewing of a quality said to be superior to a conventional TV picture.

The system incorporates a new centered TM display mode that eliminates the disadvantages of true motion presentation by maintaining own ship's position fixed on PPI while indicating moving targets with their true tails.

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

The development of the 12-inch 5600 follows closely on the introduction of the Atlas 7600/8600 series of rasterscan radars, which are said to be the first of their type to offer continuous true daylight viewing on a 16-inch screen under all ambient conditions. Comprising RM, TM, and two ARPA models, all are designed to meet or exceed IMO and USCG specifications, and are FFF type-approved.

The 7600 RM and TM systems both allow manual acquisition of up to 10 targets, as well as semiautomatic plotting with target data readout, including CPA and TCPA. The 7600 ARPA also provides full automatic tracking functions.

The 8600 ARPA permits manual acquisition of up to 20 targets with automatic tracking and target data readout, including CPA and TCPA. The system also features automatic acquisition and tracking of up to 40 targets with guard zones and limitation lines.

Other developments from KAE include the NACOS 20 series of integrated bridge control systems designed for one-man operation and precise navigation at reduced cost. Typically comprising two rasterscan radars, a doppler log, echo sounder, and an adaptive radar-controlled autopilot, the central control console also incorporates a full-color navigation information display, to-

gether with interfaces for other sensors and bridge equipment. The NACOS systems were developed partly under sponsorship of the West German Ship of the Future project.

### KRUPP MaK

Circle 67 on Reader Service Card

Since beginning operations in 1980, Krupp MaK Diesel Inc., the North American subsidiary of Krupp MaK Maschinenbau GmbH of Kiel, West Germany, has been a successful force in the North American marine market. With total engine sales exceeding 110 units, Krupp MaK has supplied diesels to a wide variety of customers, both on sea and land. These range from small fishing vessels to the largest ferry ever built in North America; from power stations within the Arctic Circle to a heavy-fuel towboat operation on the Mississippi River.

At its headquarters conveniently located next to Toronto International Airport in Canada, MaK has a comprehensive stock of spare parts backed up by factory-trained service engineers to respond immediately to customer needs. Additional spares can be supplied from Kiel, where 96-percent spares availability is maintained, within 24 hours.

Krupp MaK four-stroke, medium-speed diesel engines, designed and built to operate on heavy fuels of up to 700 cSt, cover an output range of 700 to 13,500 bhp in five engine types with bores ranging from 240 to 580 mm at speeds of 1,000 to 425 rpm. The entire engine range has been carefully planned to insure that all power requirements can be met with in-line engines (Vee engines of 12 and 16 cylinders are available for very compact drive systems) in order to reduce and simplify maintenance.

### MAN B&W

Circle 68 on Reader Service Card

MAN B&W Diesel GmbH of Augsburg, West Germany, as the world's largest designer of marine diesel engines, has developed engines with the highest thermal efficiency, while at the same time maintaining a high level of service reliability.

With the introduction of the MC low-speed series, MAN B&W brought the fuel consumption down to 118 grams per bhp-h. Compared with the 156 g/bhp-h some 10 years ago, this means a reduction of about 25 percent. At the same time the revolutions of the direct-coupled propeller have been reduced from 114 rpm to 60 rpm, leading to an increase in propeller efficiency of 12-15 percent. These factors combined mean a total savings in the fuel consumption on propulsion engines of up to 40 percent.

During the development of the new four-stroke, heavy-fuel L58/64 engine, particular emphasis was placed on low fuel consumption, high reliability in unrestricted operation, simple and easy maintenance,

adaptability to varying operating and environmental conditions, and good fuel ignition qualities. The L58/64 engine will be produced as in-line units with six, seven, eight, and nine cylinders, providing a power range (mcr) from 9,900 to 14,850 bhp.

About a year ago, MAN B&W delivered the first 6L 58/64 engine; five engines with a total of more than 50,000 bhp are currently in operation on four ships. These are two containerhips each with one 6L58/64, a 127,000-dwt bulk carrier with a 6L 88/64, and a 261,500-dwt VLCC with two 8L 58/64 units.

The excellent cost-effectiveness of this engine is the result of a modern four-stroke design, an extremely

low fuel consumption rate, and low maintenance costs.

The first engine has already logged more than 5,000 operating hours, and a total of 14,000 hours of operating experience has now been achieved. The results obtained during this period are said to be excellent. With a specific fuel consumption of only 123 g/bhph, daily consumption rates of 24 tons are being recorded on one of the containerhips at an average speed of 16.5 knots. The owners are particularly pleased with the favorable lube oil consumption of this engine.

The MAN B&W orderbook currently consists of 18 engines with a total of 231,490 bhp. These include 11 engines on order and seven units

ordered from three licensees.

### M.A.N.-GHH

Circle 70 on Reader Service Card

GHH in Blexen, Germany, is one of the oldest builders of drydocks in the world; floating docks have been on the company's program since 1878. During one 12-month period a few years ago, the yard designed, built, and delivered a 30,000-ton and a 20,000-ton dock for owners in the U.S., as well as a 22,000-ton and a 10,000-ton dock for Saudi Arabia.

Last year GHH delivered the 22,000-ton floating drydock Mission

(continued)




**Partnership with China**

**SMM '86**

International Trade Fair

Ship, Machinery,

Marine Technology with Congress

Hamburg, September 23-27

9 am - 6 pm, Sat. 9 am - 3 pm

## The Sea and Technology

Two worlds united in SMM '86. Hamburg's Trade Fair is once again the international meeting place for leading shipbuilding nations. At the Ship, Machinery and Marine Technology Trade Fair, high-quality exhibitors from all over the world present their latest products to the trade public. Automation, anti-pollution measures, communications, propulsion technology, navigation, offshore technology and manufacturing technology ... topics providing a mere cross-section of the entire spectrum covered by the Fair. The SMM Concept with its accompanying Congress offers worldwide contacts and international information. The ideal pre-requisites for an optimum market overview and insight.

SMM Hamburg. The industry's leading forum. Stimulating the world's shipbuilding and marine technology markets.

Hamburg Messe und Congress GmbH  
Postfach 30 24 80 · D-2000 Hamburg 36  
Tel. (040) 35 69 0 · Telex 2 12 609

**Hamburg Messe**

die Adresse für Congressse und Messen

I am interested in  information material MR  
 participating in the Congress

Name \_\_\_\_\_

Address \_\_\_\_\_

Country \_\_\_\_\_

Circle 121 on Reader Service Card

# German Marine Industry

(continued)

Bay to Continental Maritime of San Francisco. Noteworthy about this dock is that it complies with the damage stability requirements in accordance with Mil Std 1625. The dock has been designed to accommodate both the modern U.S. Navy combatants such as the DDG-51, and also commercial ships up to Panamax size. It features a unique remote-controlled bilge block system that allows easy adaptation to the various hull forms of modern Navy ships.

The M.A.N.-GHH facilities, on the bank of the Weser River across from Bremerhaven, have good access to the open sea. It has large fabrication shops to preassemble dock modules, as well as a slipway of more than 1,200 feet in width to accommodate construction and launching as a single unit docks of any kind or size. At launching, docks are already completely outfitted and ready for towing to final destination.

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

The management of the Dock-building Division, including engineering and sales, is located at M.A.N.-GHH headquarters in Oberhausen-Sterkrade. The German company is represented in the U.S. by American M.A.N. Corporation in New York, with branch offices in Houston, San Francisco, and Seattle.

## MTU

Circle 72 on Reader Service Card

MTU of North America, Inc. is the U.S. subsidiary of MTU Motor-und Turbinen-Union Friedrichshafen in West Germany, a member of the Deimler-Benz group. The MTU diesel line covers a power output range of 440 to 10,000 bhp at rated speeds between 1,000 and 2,400 rpm. Basic design features common to the series include Vee

configuration, water cooling, exhaust gas turbocharging, and charge air cooling.

A great number of MTU engines have proven themselves worldwide. More than 32,000 units are currently in service in locomotives, vehicles, and stationary machinery. Because of their compact design and favorable power/weight ratio, MTU engines are well known in the international shipping industry for main propulsion plants and ship's service generating systems; their modern technology and high reliability are highly regarded in the industry. There are more than 14,000 MTU engines in more than 120 countries for merchant marine and governmental service.

Applications range from tugs and fishery vessels through ferries for automobiles, trains, and passengers; hydrofoils and catamarans to offshore supply boats and fireboats, through high-speed, paramilitary and naval vessels such as fast patrol boats, corvettes, frigates, and craft for special duties such as coastal patrol boats, submarines, etc.

MTU also offers system engineering for complete propulsion systems in CODAD, CODAG, or CODOG configuration, and supplies all necessary components—including the shafting and propeller equipment, marine gears and couplings, as well as the electronic monitoring and control systems.

Over the past several years, MTU of North America has obtained increased penetration in the U.S. market. The main activity is propulsion of fast vessels in the power range of 700 to 3,300 bhp based on the 396 engine series. These fast vessels include crewboats, pleasure craft and, with increasing interest, ships to transport passengers.

Service outlets in Miami and Fort Lauderdale provide a sound basis for continued expansion; plans for intensified product support operations are under way.

## NEUHAUS

Circle 73 on Reader Service Card

J.D. Neuhaus Hebezeuge in Witten-Heven, West Germany manufactures a line of trolley-mounted air hoists for 4 bar and 6 bar air

pressure.

The JDN Profi series has lifting capacities from 220 pounds to 100 tons, and air pressure of 6 bar. They can be mounted or suspended on trolleys.

The B and M series, with lifting capacities from 1 to 12 tons, are for 4 bar air pressure. Depending on their lifting capacities, JDN hoists are operated by hand or by reel chain, or are fitted with an air motor.

All JDN air hoists are said to be particularly suitable for use in confined spaces and where there is a risk of explosion.

The German company is represented in the U.S. by Neuhaus America Corporation in Sparks Glencoe, Md.

## PLATH

Circle 97 on Reader Service Card

C. Plath of Hamburg, a division of Litton Industries, Inc., offers free literature on its Naviglobe Global Positioning System (GPS) satellite navigation receiver.

The informative literature explains what the GPS is, how it works, and how GPS user equipment processes pseudorange measurements and satellite positions to estimate three-dimensional user position and time. Features and performance of the Naviglobe are discussed and technical data is listed, including navigation signal, dynamic capability, interference immunity, reaction time, accuracy, interfaces, dimensions, and power requirements.

The publication points out that the main advantage of the Naviglobe, which was developed within the Litton Group by Plath in cooperation with a sister company, is its layout for simple operation. Without knowledge of the operator's position, time, special chart, or calibration, Naviglobe will indicate continuously its position with highest accuracy shortly after switching. Photos of the Naviglobe control display unit and receiver processor unit are included in the brochure.

## RENK

Circle 98 on Reader Service Card

One solution for obtaining overall higher efficiency and lower electrical power costs aboard ship is by driving a constant-speed generator

off the main propulsion engine, which is operated at varying speeds when driving a fixed-pitch propeller. Zahnraederfabrik Renk of Augsburg, West Germany, has developed a special gear system able to accomplish that result. The U.S. subsidiary of the German company is Renk Corporation in Duncan, S.C.

Falk Corporation of Milwaukee is licensed by Renk to manufacture a marine reverse/reduction gear of Renk design in the power range of 1,000 to 7,000 hp that is marketed as the Falk RW gear. The two companies also cooperate on special projects.

The company's RCF (Renk Constant Frequency) unit is a differential epicyclic gear capable of insuring constant-speed drive to the power generator in a fully automatic mode. This gear is usually mounted on the forward end of the engine crankshaft. The RCF allows a flexible layout in five different positions of the generator system, depending on the space available in the engine room. An additional possibility is to install the RCF along the propeller line on the main engine power take-off side.

The RCF's speed superposition is achieved by hydrostatic or electric control. The basic gear ratio is chosen so as to obtain generator synchronous speed output for a standard frequency generator at 85 percent of the engine rated speed. In this way the controls of the RCF will drive the generator at constant speed while the main engine is operating between 70 and 100 percent of its rated speed. The annulus of the epicyclic gear will remain fixed while the engine is running at 85 percent of its rated speed; in this case the power transmission is merely mechanical.

## SCHOTTEL

Circle 1 on Reader Service Card

The range of products manufactured by Schottel-Werft (Josef Becker GmbH & Co. KG) of Spay, West Germany, include: Schottel-Rudderpropellers with fixed or controllable-pitch propellers that can be steered through 360 degrees; Schottel-Navigator type units; Schottel-Transverse thrusters (also available with adjustable-pitch propellers); and Schottel-Jet systems for main propulsion or as a maneuvering aid to meet the requirements of inland waterways, sea navigation, and the offshore industry.

The recently delivered tractor tug Brooks K. McAllister, built for McAllister Brothers Inc. by Offshore Shipbuilding, is fitted with two Schottel rudder-propeller drives driven by twin Electro-Motive division 16-645EZ diesel engines. This propulsion design features two right-angle drive units located under the stern of the vessel. Each unit can rotate 360 degrees to provide virtually immediate and complete control of thrust and direction. The propellers are enclosed in nozzles to further enhance the bollard pull of the tug.

The Schottel rudder-propeller system produces a high degree of



## JIM'S PUMP REPAIR INC.

48-55 36th STREET, LONG ISLAND CITY, NEW YORK 11101

JIM LAGONIKOS, *President* Established 1974 Bob Mooney, *Sales & Service Mgr.*

### Reconditioned Coffin & Pacific Feed Pumps

Service  
24 HRS  
718-392-4444

A-1 Condition  
TYPE • F-CG - DE - DEB - IND - T  
TBA • 12 - 16 - 16½

Parts Available  
TLX - TWX  
710-5824847JPRNYK

Circle 19 on Reader Service Card

maneuverability and power that provides substantially increased economy and safety for the new tugboat. This advanced tractor tug, though common in most European and Far East ports, is said to be the first placed in service on the U.S. East Coast. She is now performing ship docking service in the Port of Jacksonville, Fla.

The Schottel system transforms engine output into optimum thrust by use of specially designed gears and a proportional propeller. Full thrust is provided to move the tug almost instantly in any direction by rotating the lower gearbox, without power loss, and with maximum maneuvering capability at full power ahead, astern, and laterally. Turning circles and stopping distance at full power can be executed in approximately one tug length.

Power is transmitted by the Rudderpropeller through silent-running, spiral-bevel gears; packing seals are fitted throughout. Fixed or controllable-pitch propellers are of the push-type, designed to suit the individual vessel. For tugboat propulsion, most of the units are fitted with nozzles to increase thrust. Schottel Rudderpropellers are available in a power range from 27 to 6,000 bhp.

Other Schottel products, the Cone-Jet and Pump-Jet, have been specially developed as steerable propulsion units and maneuvering aids for shallow-draft vessels. Such vessels include river ferries, floating plants, pontoons, and amphibious craft. The jet units are integrated into the hull and fully protects against damage by grounding. The unit produces a jet stream for optimum thrust that is steerable through 360 degrees, thus giving propulsion in any direction. Over the years Schottel jet units have proved themselves, under the most adverse conditions, all over the world.

## SIEMENS

Circle 2 on Reader Service Card

Siemens AG of Hamburg has been a supplier of a wide range of electrical and electronic equipment and services to the marine industry for more than a century. The German company is represented in the U.S. by Siemens Energy and Automation, Inc. of South Plainfield, N.J.

One of the most recent orders for the U.S. market was from Pennsylvania Shipbuilding for the power takeoff generating systems for the three fleet oilers (T-AO-191, 192, and 194) that the Chester, Pa., shipyard is building for the U.S. Navy. Each shipset consists of two 2,500-kw, constant-frequency generators driven by PTOs off the main engine reduction gear. The function of each system can be reversed, allowing the PTO generators to serve as motors for emergency "take-home" propulsion.

Another big order was from Bay Shipbuilding Corporation in Sturgeon Bay, Wisc., to supply the majority of the automation equipment,

including the consoles, for the three containerships under construction for Sea-Land Service. The first of these ships will be delivered later this year, with the other two following in 1987. Another Sea-Land order was an on-board retrofit project in which Siemens upgraded four existing containerships to operate with unmanned engine rooms (UMS).

Another recent order, via MaK

Diesel, was for supplying the alternators for the two T-AGS surveying ships under contract to Bethlehem Steel's Sparrows Point yard for the U.S. Navy.

Siemens also supplied the engine control consoles, complete with an alarm and monitoring system laid out for 340 inputs, for the 12 Econships built for United States Lines by Daewoo Shipbuilding. These ves-


sels, the largest containerships in the world, are now operating in USL's round-the-world service.

Siemens also provided a constant-frequency shaft generator of 2,000 kw for each of the six containerships being built in Japan for Lykes Bros. Steamship Company of New Orleans.

(continued)

# LISNAVE 86

## streamlined and reorganized is now ready to offer quality and "on-time" repairs



DOCK No. 13	TANKER	276 000 DWT
	DRY CARGO	33 000 DWT
DOCK No. 12	BULK	54 000 DWT
DOCK No. 11	TANKER	232 000 DWT
DOCK No. 10	TANKER	141 000 DWT
ALONGSIDE	TANKER	119 000 DWT
	TANKER	150 000 DWT
	TANKER	156 000 DWT
	REFER	10 000 DWT
	REFER	10 000 DWT
	TANKER	324 000 DWT
	TANKER	410 000 DWT
	CONT.	26 000 DWT
<b>13 VESSELS</b>		<b>2 000 000 DWT</b>

## we have:

- HIGHLY SKILLED MANPOWER**  
North Yard (Rocha) - 700  
South Yard (Margueira) - 3500
- UNLIMITED DRYDOCKING CAPACITY**
- IDEAL GEOGRAPHICAL SITUATION AND WEATHER CONDITIONS**
- LAND BASED CLEANING STATION AND BUNKERING FACILITIES (BOLIDEN)**
- VOYAGE REPAIRS (LISNICO)**
- ELECTRICAL REPAIRS (ENI)**
- OWN FLEET OF TEN POWERFUL TUGS AND TWO FLOATING CRANES (100 t. lifting)**



AERIAL VIEW OF TANK CLEANING AND BUNKERING STATION  
**Tanker being prepared for entrance the yard**

AERIAL VIEW LISNAVE - ROCHA (left)

**LISNAVE**  
ESTALEIROS NAVAIS DE LISBOA, S.A.R.L.  
APARTADO 2138 - 1103 LISBON CODEX - PORTUGAL  
TELEX: 18172 - 12649 - 16370 LISNAV P  
PHONE: 2750811 - MARGUEIRA YARD - 606171 - ROCHA YARD

TELEFAX SERVICE  
DIRECT TO LISNAVE  
FAX: 2764670  
LISBON - PORTUGAL

**LISMAR**  
Marketing Services Ltd.  
CREE HOUSE  
18-20 CREECHURCH LANE  
LONDON EC 3A 5AY - ENGLAND  
TELEX: 269 739 CMGI G  
PHONE: 01-6231233

U.S. Representative  
**EAST COAST MARINE ASSOCIATES**  
21 West Street, New York, NY 10006  
Phone—212-943-0200 Telex: 421 726 EAST UI

Circle 305 on Reader Service Card

## German Marine Industry

(continued)  
**VOITH**

Circle 3 on Reader Service Card

J.M. Voith, GmbH, headquartered in Heidenheim, is one of the leading German manufacturers of heavy machinery, with worldwide production facilities, including the U.S.

Its main products, in addition to the well-known Voith-Schneider propeller (VSP), are paper machines and equipment for pulp preparation, large water turbines and pumps for hydropower and storage power stations, power transmissions, torque converters, hydrodynamic couplings, reduction gears, fully automatic gears, cardan shafts, etc.

The VSP is a vertical-axis propeller for the highest degree of reliable

maneuverability. Pitch is controlled by two independent coordinates (hydraulic rams)—one for the longitudinal, the other for the transverse ship axis. This guarantees very simple and precise handling of ships equipped with the VSP. Extremely low rpm (only about one-quarter of a comparable screw propeller) and highest quality of forged chrome-nickel steel blades result in a very rugged and reliable shipboard machine, highly resilient against impact with floating debris.

Voith-Schneider propellers are used wherever high and precise maneuverability is required. Typical applications are:

Voith Water Tractors—a tugboat concept developed by Voith—with highest shiphandling capabilities and safety. There are some 500 Voith Water Tractors now in operation in 95 harbors worldwide.

Double-ended ferryboats, with one propeller forward and one aft. They are not only highly maneuverable but also can compensate with their propellers against strong side winds and currents when safe and precise entering into terminals is required. About 300 VSP-equipped ferries, on most major routes, are operating worldwide. Two of the most recent to enter service are the ferries built by Robert E. Derecktor shipyard for the City of New York's Department of Transportation. With a passenger capacity of 1,200 each, their primary use is for off-peak passenger-only travel between Manhattan and Staten Island.

For minehunting vessels, VSPs are used as main and auxiliary drive and steering device all in one for cruising, precise position-keeping, and maneuvering with low underwater noise signature during minehunting between zero and seven knots. With these vessels, the propellers are arranged side-by-side astern.

## WESTFALIA

Circle 5 on Reader Service Card

Westfalia Separator AG of Oelde/Westfalia, West Germany, designs and manufactures equipment and systems for every oil purification need. Westfalia products are marketed in the U.S. by Centrico, Inc. of Northvale, N.J. Centrico provides expertise to help design, install, and service Westfalia equipment. Skilled engineering advice and assistance, as well as parts, are usually available overnight at any port on the Atlantic, Pacific, or Gulf Coasts.

Westfalia oil purifiers are available as single machines or as pre-assembled "Centri-Pack" modules, with heaters, pumps, strainers, controls, wiring, etc., installed and ready to go. Westfalia systems allow monitoring of such vital functions as oil flow, oil temperature, increased water discharge, oil break-over, failure to shoot, motor temperature, vibration, and excessive number of second-stage solids or water discharges. Control stations, with audible and visual alarms, can be located remotely and/or at the equipment.

Westfalia oil-purifying centrifuges, including the automatic, self-cleaning model OSA 20 and the take-down OTB 2 version, are being increasingly specified by diesel engine manufacturers and shipbuilders for workboats, service vessels, and offshore platforms.

By removing water solid fines and other impurities from heavy fuel oil, Westfalia purifiers permit efficient combustion of the low-cost grades of fuel. Put to work eliminating similar contaminants from lube oils, they also enable operators to recycle lube oils, thus forestalling premature engine wear and reducing downtime, as well as extending lube oil life.

Westfalia OSA models are especially suitable for automatic, continuous operation. They incorporate self-cleaning, disc type bowls designed for optimum oil-water separation even when oil characteristics and feed rates change. OSA models are available with maximum rated capacities of 5,500 gph, but actual throughput depends on viscosity, specific gravity, and other properties of the oil.

Westfalia OTB take-down oil purifiers are designed for dewatering and removal of solid impurities from fuel and lube oils. They are currently in use on many offshore service vessels in the Gulf of Mexico area, and on other workboats throughout the world.

## ZF

Circle 4 on Reader Service Card

Zahnradfabrik Friedrichshafen AG of Friedrichshafen, West Germany, offers an attractive color brochure describing its ZF marine transmission systems. The 16-page publication is arranged in seven double-page sections.

ZF marine gearboxes, used by eight of the 10 West European navies on their fast craft, incorporate the comprehensive experience de-

Waterjet Propulsion Systems  
up to 25,000 kW

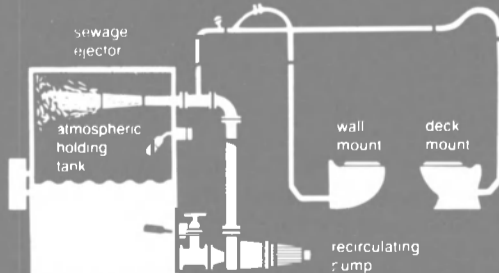
Waterjet type IRC 41 DL, complete with disconnecting clutch

**RIVA CALZONI** 150 years of experience in hydraulics

Riva Calzoni S.p.A. - Via Stendhal, 34 - 20144 MILAN (Italy) - tel. 2/479151 - telex 332292 RIVATI - telefax 2/425749

Circle 254 on Reader Service Card

The E-VAC sewage ejector now makes a holding system the sensible choice.



- low volume fresh water flush toilet (2 pints/flush)... 10 man crew produces 15 gals. of sewage per day
- small diameter piping... 1-1/2" and 2"
- piping layout flexibility... with vertical lift
- reduced holding tank size... 80% smaller
- system components can be adapted to utilize ship's hull tanks where space is limited
- toilet vents eliminated

1260 Turret Drive  
Rockford, IL 61111 U.S.A.  
815/654-8300, Telex 257-415  
Toll Free: 800-435-6951  
(except IL, HI, AK)

7036-30 Street S.E.,  
Calgary, Alberta, T2C 1N9 Canada  
403/279-2669, Telex 03-821885  
Toll Free: 800-661-3161

**ENVIROVAC, INC.**

Circle 20C on Reader Service Card



rived from all phases of transmission work, and the close cooperation and intensive exchange of ideas between ZF development departments and engine manufacturers and shipyards worldwide.

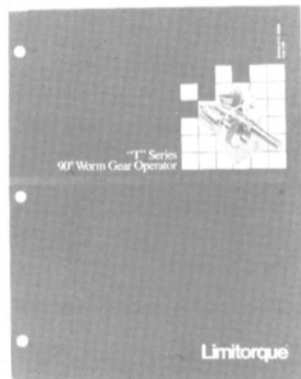
ZF invests a large and ever-increasing proportion of its annual turnover in research and development. Intensive testing is an integral part of all development, research, and production phases. Test teams are at work constantly in laboratories, at test rigs, and in the field. A highly qualified production staff has the necessary experience, and a very high standard of quality is achieved by a sophisticated quality assurance system.

Among the advantages of ZF marine gearboxes noted in the brochure are: small dimensions and maximum torque; use of expertly and carefully selected materials; lubricants carried to gears and bearings at the optimum rate through purpose-designed pressure systems; quiet running; lightweight but robust; rapid-acting clutches; easy servicing and overhauling; and reliability and long life.

Shown in cutaway drawings are ZF gearboxes for fast craft, workboats and crewboats, Navy vessels, port authority craft, lifeboats, ferries, and passenger vessels.

ZF is represented in the U.S. by ZF of North America, Inc., Lincolnshire, Ill.

## Limitorque Offers Color Brochure On 'T' Series Worm Gear Operator



A six-page color brochure provides details on Limitorque's new quarter-turn "T" Series worm gear operator featuring a high strength cast iron enclosure, and O-ring seals for permanent lubrication. Including applications for manual and motorized control of quarter-turn valves, the new brochure provides a "see-through" illustration of the unit, and details comprehensive torque capabilities from 250 to 350,000 ft. lbs. adjustable external mechanical travel stops, spur gear attachments, and self-locking worm gears.

Designed for commercial service above ground, buried, or submerged, new "T" Series operators conform to AWWA C504-80 specifications and are available in stock, or with modifications to meet exacting specifications.

For a free copy of the new brochure.

Circle 87 on Reader Service Card

## Sperry MCS2B SatCom INMARSAT Type Approved —Literature Available

Sperry Corporation, Charlottesville, Va., recently received full type approval of its INMARSAT MCS2B satellite communicator by INMARSAT.

"The MCS2B represents a major new direction in shipboard communications, as it features the first rug-

gedized marine computer ever included as a standard, integral part of a ship's earth station," said C.R. Kenney, vice president of marketing at Sperry's Charlottesville operation.

George Tsirimokos, satellite communications project manager, stated: "This imaginative departure from standard type satcoms is truly exciting. In addition to the new MCS2 series ship earth station and its ruggedized 300 MC marine com-

puter, a complete set of software programs for personnel administration, payroll, planned ship maintenance, cargo loading and spares inventory is available to the user from Sperry."

For further information, including free detailed literature on Sperry's MCS2 series ship earth station, ruggedized 300 MC marine computer and software programs,

Circle 47 on Reader Service Card

# GASTECH 86

The 12th International LNG/LPG Conference & Exhibition  
Congress Centrum, Hamburg, November 25-28, 1986

## FINAL PROGRAMME

### Session 1 WORLD GAS SUPPLIES

Chairman: A. Pastuhov, President, AVP Corporation, Newbury Port, Mass., USA

World gas reserves and availability  
J.T. Jensen, Jensen Associates, Inc., Boston, Mass., USA

Obstacles to new natural gas developments in low-income countries  
D.M. Spottiswoode and J.E. Jenkins, Gasistance Ltd., London & M.H. Shirazi, Gas Coordinator, Energy Department, World Bank, Washington D.C., USA

The competition to supply West Europe with gas — what are the prospects for the USSR in particular?  
H. Cavill and H.M. Rowson, Tricem Consultants Ltd.

Gas Prospects off the Northern Territory coast  
Hon. B. Coulter, Minister for Mines & Energy, Northern Territory Government, Darwin, Australia

Korean plans for LNG imports  
H.B. Sunwoo, Vice President, Korea Gas Corporation

The role of the LNG transporter  
M.J. Cooper, Chief Executive, Shipping, and J.L.L. Packer, Burmah Oil Trading Ltd., London

Panel Discussion — The LNG Trades: adjusting to the challenge of the buyers' market

Chairman: A. Pastuhov, President, AVP Corporation

Moderator: J. Ball, Editor, Financial Times' International Gas Report, London

Panelists: Dr. M.K. Faid, Director of Gas Exports, Sonatrach, Algiers, Algeria, J.T. Jensen, Jensen Associates Inc., Boston, Mass., USA, D.M. Spottiswoode, Director, Gasistance Ltd., London, P.J. Anderson, Associate Director, Institute of Gas Technology, Chicago, Ill., USA, H. Cavill, Director, Tricem Consultants Ltd., London, M.J. Cooper, Chief Executive, Shipping, Burmah Oil Trading Ltd., London, H.B. Sunwoo, Vice-President, Korea Gas Corporation, Seoul, Korea, M.W.H. Peebles, Director, Shell International Gas Ltd., London, B. Bramono, Head of Gas Marketing, Pertamina, Jakarta, Indonesia, M.B. Hashim, Managing Director, Malaysian LNG Sdn. Bhd., Kuala Lumpur, Malaysia, P. Hodgson, Project & Export Financial Consultant, Henley on Thames, UK, C. A. Durr, Manager Technology, Gas Processing, M.W. Kellogg Company, Houston, Texas, USA

Session 2 LPG PRODUCTION AND TRADE

Chairman: S.M. Boushehri, Poten & Partners (UK) Ltd.

Speakers:

The marketing of new LPG exports from Indonesia  
B. Bramono, Head of Gas Marketing Bureau, Pertamina, Jakarta, Indonesia

Potential diversification of LPG markets from the Middle East  
K.A. Harami, Manager, Sales, Western Hemisphere, Kuwait Petroleum Corporation, Safat, Kuwait

The development and future growth of LPG in Korea  
Y.I. Jin, Managing Director, Yosun Energy Co. Ltd.

Japan and international LPG trade  
K. Kasuga, General Manager, LPG Division, Showa Shell Seikiyu K.K., Tokyo, Japan

Butanes to gasoline  
Dr. R. Lambert, Supply and Distribution Manager, ARCO Chemical Europe Inc., Eton, Berks, UK

The outlook for oil prices in 1987  
M. Varzi, Kleinwort Grieson & Co., London

Panelists:

Dr. A. Abduljawad, Export Services Division, Petromin, Riyadh, Saudi Arabia, Miss S. Haddad, Head of LPG Research & Planning Division, Petronal, London, E. Al-Mutawa, Acting Manager, Marketing & Transportation Department, Qatar General Petroleum Corporation, Doha, Qatar, Dr. M. K. Faid, Director of Gas Exports, Sonatrach, Algiers, Algeria, C. Medina, Manager, LPG & Special Products, Maraven S.A., Caracas, Venezuela, L.A. Nielson, President, Trammo Gas & Petrochemicals Ltd., Bahamas, H.D. Wehner, Progas, Dortmund, Germany FR

Session 3 SAFETY AND TRAINING

Chairman: R.C. Gray, General Manager, Society of International Gas Tanker and Terminal Operators Ltd.

The SIGTTO recommendations and guidelines for linked ship/shore emergency shut down  
J.B. Whitmore, Chairman, SIGTTO Working Group, BP International Ltd., London and R.C. Gray, SIGTTO

An approach towards establishing a safety survey of a liquefied gas marine terminal  
M.Z. Navaz, Lloyd's Register of Shipping, London

A safety training programme onboard LNG carriers  
E.C. Blogg, Marine Safety Services Ltd., London

Approach and experience of training new personnel for gas processing plant from grassroots  
M.H. Embong & Dr. R. Karim, PETRONAS Gas Sdn. Bhd., Terengganu, Malaysia and J.F. Rutten & J.W. Bouten, Stamicarbon B.V., The Netherlands

Fire protection of LPG tanks  
Dr. B.W. Fullam, Fire & Explosions Division, Health & Safety Executive, Bootle, Merseyside, UK

Attenuation of radiant heat on LNG/LPG carriers with free-standing water curtains  
Miss S. Stephenson & Dr. M.J. Coward, Principia Mechanical Ltd., London

Session 4 DEVELOPMENT OF FRONTIER GAS FIELDS: THE TECHNOLOGICAL CHALLENGE

Chairman: R.S. Kvamsdal, Kvaerner Subsea Contracting A/S, Lysaker, Norway

Moderator: Prof. K. Kokkinowrachos, Professor of Ocean Engineering, Technical University of Hamburg-Harburg

Panelists: Dr. E. Raren, Chief, Industry & Offshore Division, Det norske Veritas, Hovik, Norway, R.D. Miller, Vice-President, MacDermott Marine Construction Inc., New Orleans, LA, USA, J. Delacour, Director for Research, Institut Français du Pétrole, France

Session 5 TRANSPORTATION, TECHNOLOGY & OPERATIONS

Chairmen: R.J. Lakey, Robert J. Lakey & Associates, Inc., Houston, Texas, USA and R.C. Ffooks, Consultant, UK

Some design aspects of multi-grade liquefied gas/chemical/products carriers  
M. Bockenbauer, Germanischer Lloyd, Hamburg

An overview of the design features of the self-supporting prismatic tank system (SPB) LNG carrier  
T. Fujitani, Y. Okumura, A. Ando, T. Nagano, E. Aoki, K. Yamakawa & A. Abe, H.H.I. Co. Ltd., Tokyo, Japan

Experiences and results of gas tanker operation with the CATO on-line computer  
Dr.-Ing. D. Ackermann & Dipl.-Ing. W. Huttmacher, LGA Gastechnik GmbH, Rolandseck, Germany FR

Fatigue tests on an LNG carrier tank corner assembly  
P. Vercamer & P. Sauve, Gaz de France, St Denis and R. Loofoet, Gaz Transport, Trappes, France

Evacuated insulating boxes giving low boil-off for Gaz Transport methane carriers  
E. Flesch, Gaz de France, DETN, Nantes and R. Loofoet, Gaz Transport, Trappes, France

Reliability and safety verification of membrane components  
M. Huther, P. Anslot and M. Zehri, Bureau Veritas, Levallois, France

The key to higher loading limits for cargo tanks on LNG carriers — the LGA additional pressure-relieving systems  
W. Kolb and H. Boltze, LGA Gastechnik GmbH, Remagen-Rolandseck, Germany FR

Nitrogen production by membrane separation  
Th. Jonnassen, Maritime Protection A/S, Kristiansand, Norway

Nitrogen producing inert gas plants on board liquefied gas tankers — experiences and aspects  
Dr. L.R. Oelrich, LGI Ingenieurgesellschaft mbH, Bonn, Germany FR

Inert gas systems on board liquefied gas tankers  
H.J. Tepper, Smit Ovens B.V., Nijmegen, The Netherlands

Development of the Sulzer dual fuel diesel engine  
B. Engesser, Sulzer Bros. Ltd., Switzerland, T. Imai, Ishikawajima Harima Heavy Industries Co. Ltd., Japan, Y. Koyama, Sumitomo Heavy Industries Ltd., Japan, and K. Takahashi, Nippon Kokan K.K., Japan

Development of a large bore two-cycle diesel engine for LNG carriers  
Y. Terashima, J. Maehara, K. Imanishi, T. Yamada, Y. Matsumura & Y. Izumi, Mitsubishi H.I. Ltd., Japan

Large diesel engines using high-pressure gas injection technology  
O. Grøne & P.S. Pedersen, M.A.N.-B&W Diesel A/S

The case for Steam Turbine Propulsion systems, presented by P.E. Larsson, ASEA-Stal, Sweden and J.B. Donnelly, Foster Wheeler Power Products Ltd., London.

### Session 6 PETROCHEMICAL GASES: TRADING PROSPECTS & DEVELOPMENTS

Chairman: P.R. Mitchell, Consultant, U.K.

Worldwide Movements in the ethylene, propylene and butadiene trades  
Dr. D.S. Glass, Chem Systems International Ltd., London

Petrochemical gas shipping developments  
J.R. Evans, H. Clarkson & Co. Ltd., London

European/USA petrochemical gases — a producer/consumer view  
S. Kostering, DSM Polymers and Hydrocarbons Division, Urmond, The Netherlands

Current VCM trade in the Far East/South East Asia and its future  
M. Meguriya, Mitsubishi Corporation, Tokyo, Japan

Discussion: The speakers listed above will be joined by B.K. Markusen, Norwegian Gas Carriers Ltd., Norway and M. Faveret, Interbras, Brazil for a Panel Discussion.

Session 7 LIQUEFIED GAS TERMINALS AND STORAGE

Chairman: W. Brumshagen, Managing Director, LGA Gastechnik GmbH, Rolandseck, Germany FR

The commercial implications in the premium gas market of Calor's underground storage at Humberston  
A.G. Acketts, Calor Gas Ltd., Slough, England

A prefeasibility study of offshore production and loading at Tromsøfaket  
G.L. Kjersem and I. Vik, Norsk Hydro, Bergen, Norway

Offshore terminals for low temperature liquefied gases  
H. Pakleppa, LGA Gastechnik GmbH, Rolandseck, Germany FR and P.B. van Berkel, SBM Offshore Systems

More than 20 years of LNG operations at the GL4.Z (ex-CAMEL) plant  
A. Benazzouz & H. Abbou, Sonatrach, Arzew, Algeria

Reception of different quality LNG's in a large storage tank  
J.F. Léchat & S. Caudron, Gaz de France

Modular engineering — applications in liquefaction plant design  
C.A. Durr & R. Tarakad, M.W. Kellogg Co., Houston

Prestressed concrete/steel tanks for liquefied natural gas storage in the Arabian Gulf  
D.M. Morrison, Chicago Bridge and Iron Co. USA

Concrete pressure vessels — the preventive answer to the Mexico City LPG disaster  
H. Bomhard, Dyckerhoff & Widmann, Germany FR

Session 8 GASES AS TRANSPORTATION FUELS

Chairman: T.J. Joyce, T.J. Joyce Associates, USA

European automotive LPG — uncertain times, uncertain future  
W.C.F. Arnold, William Arnold Associates Ltd., England

Bangladesh CNG pilot project  
A.R. Khan and J.G. Edwards, GDC Inc., Chicago, Ill., USA

Factors influencing the use of CNG as an automotive fuel  
A.J. Zwemmer, Sulzer-Burckhardt, Switzerland

Volkswagen conversions to gaseous fuels: some environmental considerations  
R.E. Peisinger, CNG Services of Pittsburgh, Inc. USA

Discussion: The future of gases as automotive fuels

Session 9 TECHNICAL DEVELOPMENTS AND MATERIALS

Ultrasonic flowmeters for cryogenic mediums  
G. de Sorbier, Crouzet SA, Valence, France

HIC resistant steels for gas transportation  
S. Genet, C. Perdrix & R. Boulet, Usinor, France

Studded foil made of V2A Nobel steel — a cost-saving alternative to conventional liner systems for concrete LNG storage facilities  
S.R. Speidel, Bilfinger + Berger Bau-AG, Germany FR

The determination of low concentrations of water in natural gas by coulometric Karl Fischer titration  
G. Robertson, Petrochem Analysis Ltd., Bedford, England

A new approach to gas detection  
H.J. Hübner, Gesellschaft für Gerätebau, Germany FR

The organisers reserve the right to amend this programme should circumstances so require.

## REGISTRATION FORM

Please register the following as delegates to Gastech 86

Name \_\_\_\_\_

Title \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Telephone \_\_\_\_\_ Telex \_\_\_\_\_

Registration Fee: £400/DM.1360/US\$600 per person. Fee covers attendance at all sessions, lunches, cocktail parties, preprints of papers and conference documentation etc.

Make cheques payable to GASTECH

Mail with form to:  
Gastech Secretariat, 2 Station Road,  
Rickmansworth, Herts WD3 1QP, England  
Telephone: (0923) 776363 Telex: 924312

Official Carrier: Lufthansa

MR

Circle 119 on Reader Service Card

## REMOVAL SALE—MUST VACATE

(2) Recond Ingersol Rand **10GTM ALL BRONZE CARGO OR FIRE PUMPS**, 4000 GPM at 135 psi, equal to new. PRICE: \$4,900 each.

(2) New Riley Baird **EVAPORATOR CONDENSERS**, all bronze with copper nickel heads, 110 sq. ft., could be used as heat exchangers. PRICE: \$1,250 ea.

(10) **NEW TURBINE ROTORS 14" 16" 18" & 30"**, milled type for Whiton and Terry turbines.

All types of new **PILLOW BLOCKS**, self-aligning, from 2" to 8".

All types of new **GAUGES**, from 0-100# to 0-1000#; 4½" and 6". PRICE: \$19 each.

(3) Recond. **B&W CYLINDER HEADS** for Sulzer 840 x 1800 engines.

(1) New cast steel 8" Hayward **DUPLEX MARINE STRAINER**. Original cost \$12,000. OUR PRICE: \$2,900.

(6) New Carrier 7G8 **REFRIGERATION COMPRESSORS** 35-ton units. PRICE: \$1,800 each.

(2) Reconditioned Dunham Bush 40-ton **AIR CONDITIONING COMPRESSORS**. PRICE: \$900 each.

(2) Mark XIV **GYRO COMPASSES**. PRICE: \$500 each.

(1) Equal-to-new (built 1984) Quincy P100 **AIR COMPRESSOR**, 450 CFM at 125 psi, complete with 100hp motor and tank. Original cost \$39,000. OUR PRICE: \$8,900.

(1) New Buffalo 15000CFM **AXIAL FLOW FAN** complete with 15hp 440 V explosion-proof motor.

(2) New Buffalo **AXIAL FLOW FANS**, 100,000CFM at 4", complete with 100hp 440V explosion-proof motors.

(2) New Suez Canal **SEARCHLIGHTS**. PRICE: \$250 each.

(3) New all bronze 10" **250# GATE VALVES**. PRICE: \$600 ea.

(10) Recond. Westinghouse low C-225 pressure **TURBINES**, 575hp at 3000 rpm, 175# pressure, 8" vacuum.

All types of **SAFETY VALVES**, recond with ABS, from ½" to 5", from 150# to 900#. Example of our prices: 4" 600# recond safety valve—\$1,100.

(2) New Jerguson eye-high **BOILER INDICATORS**. PRICE: \$100 each.

(10) **NEW REFRIGERATION COILS** for air conditioning units, 15-ton, 20-ton and 30-ton units; brand new, manufactured by Marlow & Kolmac Coil Company, with copper nickel coils and priced at less than 25% of manufacturer's price.

(1) 3" New Leslie **PUMP GOVERNOR VALVE** for 900# steam. Leslie's price \$9,000. OUR PRICE: \$1,200.

(25) Shots unused 1½" **CAST DILOK CHAIN**. OUR PRICE: \$600 per shot.

(20) Shots used, in excellent cond., 1½" **DILOK CHAIN**. PRICE: \$400/shot.

(1) 10' **MEMARCO STRAINER**, 125#. PRICE: \$250

(1) New **COPPUS TF20 TURBINE** 100hp at 3600RPM horizontal. PRICE: \$2,500.

All types of new **CAST STEEL VALVES**, from 2½" to 8", gate and angle.

(3) New **VERTICAL EXPLOSION-PROOF MOTORS**, General Electric 150hp 440V 1750 rpm. PRICE: \$1,800 each.

All types of **RUBBER EXPANSION JOINTS**, including (8) 24" brand new expansion joints. New Price: \$1,800; OUR PRICE: \$295 each.

(1) Rebuilt **ARNESON SHIPPING HAMMER** 110V DC motor. OUR PRICE: \$100.

(1) 5" **TATE VERTICAL STRAINER** 125#. PRICE: \$300

(4) 4½" **ALL BRONZE GLOBE VALVE** for evaporators manufactured by Crane. PRICE: \$300 each.

(1) 14" 125# **GATE VALVE**. PRICE: \$500.

(5) New 2600# **BALDT STOCKLESS ANCHORS**. OUR PRICE: \$750 each.

(1) 4" Andale **CAST STEEL FUEL OIL STRAINER**. PRICE: \$750.

(50) Used, in excellent cond., **CYLINDER HEADS, BEARINGS, LINERS AND PISTONS** for General Motors 8-278A & 16-278A diesel engines. PRICE: 40% of new cost.

(2) 8" **ALL BRONZE FULTON SYLPHON VALVE**, in excellent cond. PRICE: \$495 each.

All types of new **HIGH SPEED COUPLINGS**, from 1"-4", including all types of couplings for turbine main engines.

New **COMPLETE PUMPS, 3-STAGE, 4-STAGE AND 5-STAGE DEEP WELL**, manufactured by Worthington, Peerless, Byron Jackson, Bingham and Gould.

(4) New **STAINLESS STEEL PROPELLERS**, 5-bladed, manufactured by Avondale, 10' 9" diameter, 13' 5" pitch, ABS Certified for large tugs. Original cost \$39,000 ea. OUR PRICE: \$5,900 ea.

All types of **SHAFTING**, from 3½" to 27" diam., lengths from 5' to 30'.

All types of **AXIAL FLOW FANS**.

(5) New Dibert Bancroft & Ross **4-ROLLER TOWING OR WARPING CHOCKS**, brand new. Original cost \$9,000 each. OUR PRICE: \$1,900 ea.

(4) New 10" **CAST STEEL DOUBLE BITTS**. Original cost \$1,200 ea.; OUR PRICE: \$300 each.

(50) 3" **CAMP STEEL WORKS CONNECTING LINKS**. PRICE: \$100 each.

Reconditioned **ALL BRONZE LIQUID END** for Worthington 14x14x12 cargo pump. PRICE: \$5,000.

(1) New **LIQUID END** for Worthington 16x14x18 cargo pump. OUR PRICE: \$8,000.

All types of Waukesha **STAINLESS STEEL BEARING SLEEVES** for oil bearings or tailshafts.

All sizes **HEAT EXCHANGERS** for turbogenerators and diesel engines.

(6) **CYLINDER HEADS** for Norberg 21" diesel engines.

Reconditioned Carrier 5H60, 5H80 and 5H120 **REFRIGERATION COMPRESSORS**.

(1) Berger equal-to-new **TOWING FAIRLEAD** for ocean going tugs, 2½" wire rope. New cost approx. \$20,000. OUR PRICE: \$2,900.

(2) **800" AIR BOTTLES** for diesel engines, approximately 20 cubic feet.

(100) New **U-BEND ECONOMISER ELEMENTS**, cast iron gill rings, 5" over gill rings, 2" OD tube for Foster Wheeler boilers.

(6) American Hoist & Derrick 7x12 **AIR OPERATED WINCHES**, capacity 5-ton at 120' per minute. PRICE: \$1,950 each.

(1) Recond. Carrier Model 5H40 **REFRIGERATION COMPRESSOR** complete with 15hp hermetically-sealed motor, in excellent cond. PRICE: \$1,200.

(3) New Jenkins 3" **600# STEEL BOILER GLOBE VALVES**.

(2) Recond. **M17 YORK REFRIGERATION AIR COND. UNITS**, centrifugal, complete with heat exchangers, condensers; one-piece unit with 100hp 440V hermetically-sealed marine motor. Original cost \$139,000. OUR PRICE: \$18,000 ea.

(20) pcs 1½" **AND 2" STAINLESS STEEL SHAFTING**, 10' long threaded on both sides.

(1) New Velcon **OILY WATER SEPARATOR**, 20GPM, brand new, complete with gauges and testing equipment. PRICE: \$995.

(3) Used Star Electric **MOTOR GENERATOR SETS**. 125hp 230V DC motors, driving 75kw 220V DC generator, complete w/switchboard & starters. PRICE: \$2,900 each.

(1) Reconditioned 16" **SIMPLEX STRAINER**. PRICE: \$1,800.

All sizes Worthington **HORIZONTAL, VERTICAL SIMPLEX STEAM PUMPS**, including 7½x4x6, 10x6x10.

(50) Reels used **WIRE ROPE**—¾" to 1¼".

(20) Tate 4" **VACUUM RELIEF VALVES**, from ½# to 2# pressure.

(1) 40' **ALUMINUM ACCOMMODATION LADDER** with self-aligning treads, less turntable. Original cost \$6,500. OUR PRICE: \$2,500.

All parts for **400/500/600/700/800 AND 1000KW** General Electric and Westinghouse **TURBOGENERATORS**; most brand new.

Reconditioned, in excellent condition, Coffin **FEED PUMPS**, sizes F, CG, DB, DE, DEB & DEB16, recond. by Coffin. Priced at less than ½ of new price.

(20) New **100 AMP CIRCUIT BREAKERS**. PRICE: \$25/ea.

(2) Recond. 200hp Gyroflo American Blower **HYDRAULIC COUPLINGS** for molasses pumps or any other type slow speed; can vary speed up to 75%.

(2) Reconditioned Fairbanks Morse 1000hp 8-cylinder 38DB-½ diesel engine, in excellent condition, for generator drive. PRICE: \$8,900 ea.

**Marine and Naval  
Equipment  
New and Rebuilt—  
For Immediate  
Delivery Anywhere in  
the U.S.A.**

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

# PROFESSIONAL

**AmSEC** AMERICAN SYSTEMS  
ENGINEERING CORPORATION  
Marine Engineers • Port Engineer Services  
Systems Analysis • Propulsion Plant Training  
Qualified Manufacturers Field Representatives  
P.O. Box 8988 • Virginia Beach, VA 23452 • (804) 463-6666  
Philadelphia, PA • Pascagoula, MS • Virginia Beach, VA  
Arlington, VA • San Francisco, CA • San Diego, CA

**Ameritech Corp.**  
Commercial • Shipbuilding & Repair  
7 Belver Avenue, Suite 215  
Quonset Point - Davisville Ind. Park  
North Kingstown, Rhode Island 02852  
401 295-2663  
401 295-2664

**AMIRIKIAN ENGINEERING CO.**  
HARBOR AND DRYDOCKING FACILITIES  
FLOATING LIFT DOCK AND SHORE TRANSFER  
CONCEPTS, DESIGN, INVESTIGATIONS  
Chevy Chase Center Office Bldg.  
Suite 505, 35 Wisconsin Circle  
Chevy Chase, Md. 20015 (301) 652-6903

NAVAL ARCHITECTS MARINE ENGINEERS  
**ART ANDERSON ASSOCIATES**  
Bremerton, WA (206) 479-5600  
Seattle, WA (206) 622-6221

**Captain Astad Company, Inc.**  
Complete Marine Services - Full Broker Service  
Owners Representative Service  
Purchase & Sale of All Types of Vessels  
CAPTAIN A. J. ASTAD P.O. BOX 53434  
President NEW ORLEANS, LA 70153  
PHONE (504) 529-4171 (24 HRS.)

**Ocean Engineering Centre**  
SHIP-MODEL TESTING  
• Resistance Tests • Flow Visualization  
• Wake Surveys  
• Towed Directional Stability Evaluations  
• Seakeeping  
For Information Contact:  
**B.C. Research**  
Ocean Engineering Centre  
3650 Westbrook Mall,  
Vancouver, Canada V6S 2L2  
Telephone (604) 224-4331  
Telex 04-507748

PUSHBOATS, TUGS, CREWBOATS, TENDERS  
BARGES OF ALL TYPES, INLAND OR OFFSHORE  
WILLIAM T. BERGERON  
BERGERON & ASSOCIATES  
MARINE BROKERS  
(504) 271-7171  
P.O. BOX 726 CHALMETTE, LA 70044  
"IF YOU NEED IT, WE CAN FIND IT"

**CDI MARINE CO.**  
NAVAL ARCHITECTS  
MARINE ENGINEERS  
EXECUTIVE OFFICE, JACKSONVILLE, FL  
904/723-2620  
JACKSONVILLE, FL 904/724-9700  
CHESAPEAKE, VA HAMPTON, VA KNOXVILLE, TN  
804/543-4211 804/627-4328 615/693-0545  
PHILADELPHIA, PA 609/228-1855 BOSTON, MA 617/878-8340  
BREMERTON, WA 206/479-8829 SEATTLE, WA 206/235-0888  
PASCAGOULA, MS 601/762-0098 YOKOSUKA, JAPAN 011-81-468-261911  
A QUALITY TEAM

**C.T. MARINE**  
NAVAL ARCHITECT • MARINE ENGINEER  
18 Church Street, Georgetown, CT 06829  
Telephone: 203-544-8110  
Telex: ITT 4994761  
TUGS  
TOWBOATS  
BARGES

**CHILDS ENGINEERING CORPORATION**  
Waterfront Engineering  
Diving Inspection  
BOX 333, MEDFIELD, MA 02052  
16171 359-8945

**Thomas Coudon Associates**  
Marine Equipment Sales  
6655 Amberlon Drive Baltimore, Md. 21227 (301) 796-2525

**CRANDALL DRY DOCK ENGINEERS, INC.**  
Railway and Floating Dry Docks  
Waterfront Structures • Consulting  
Design • Inspection  
Dry Dock Hardware and Equipment  
21 Pottery Lane Dedham, MA. 02026  
Tel. (617) 329-3240 Telex: 924406

**C. R. CUSHING & CO., INC.**  
NAVAL ARCHITECTS, MARINE ENGINEERS  
& TRANSPORTATION CONSULTANTS  
18 Vesey Street  
NEW YORK, N.Y. 10007  
TEL (212) 964-1180 CABLE CUSHINGCO  
TX: 752481

**DLI MARINE ENGINEERING CORPORATION**  
MARINE VIBRATION ANALYSIS  
NOISE CONTROL  
253 Winslow Way West, Bainbridge Island, WA 98110  
(206) 842-7656

Measurement, recording and analysis of mechanical, structural and electrical phenomena.

**DEL BREIT INC.**  
MARINE ENGINEERING CONSULTANT  
326 Picayune Place Suite 201  
New Orleans, La. 70130  
(504) 523-2801

**DESIGN ASSOCIATES, INC.**  
M. KAWASAKI  
14360 Chef Menteur Highway  
New Orleans, Louisiana 70129  
Naval Architects Marine Engineers  
Marine Management Transportation Consultants  
Phone: (504) 254-2012 TWX 810-951-5317

**DESIGNERS & PLANNERS, INC.**  
NAVAL ARCHITECTS MARINE ENGINEERS  
CRYSTAL PARK #1, SUITE 500 2011 CRYSTAL DRIVE ARLINGTON, VA 22202 (703) 892-8200 TWX 710-955-1132  
190 TOWNE STREET NORWICH, CT 06360 (203) 887-2501  
1941 OLD CUTHBERT ROAD SUITE 106 CHERRY HILL, NJ 08034 (609) 795-1170  
797 BROADWAY BAYONNE, NJ 07002 (201) 339-9446

**ECO Inc.**  
Ship Design and Engineering  
Ports, Waterways and Offshore Facilities  
Military and Defense Systems  
1036 Cape St. Claire Center, Annapolis, Md. 21401  
(301) 757-3245


**ENCON MANAGEMENT & ENGINEERING CONSULTANT SERVICES**  
Marine Structures • Engineering Analysis • Marine Survey  
Project Management • Loss Prevention • Naval Architecture  
P.O. Box 7760 • Beaumont, Texas 77706  
(409) 866-9158

**Envisions ENGINEERING VISIONS, INC.**  
Formerly PRC Guralnick and PRC Marine Services  
Naval Architects & Marine Engineers  
1111 Bay Boulevard Chula Vista, CA 92011  
(619) 575-3300

BARGES - TUGS - TOWING *Jack Faulkner, Inc.* Cable Address: FAULKBOAT  
CHARTERS AND SALES ESTABLISHED 1954 '312) 798-2419  
PROCUREMENT AGENTS ON INLAND AND OCEAN TOWING  
P.O. Box 371  
2419 Caddy Lane, Flossmoor, Illinois 60422  
"TOWING ANYWHERE THERE IS WATER"

**CHRISTOPHER J. FOSTER, INC.**  
WORLD-WIDE EXPERIENCE AS DESIGNERS OF  
GRAVING DOCKS • MARINE STRUCTURES  
SHIPYARDS • MODERNIZATION • PORT FACILITIES  
OFFSHORE TERMINALS • FLOATING DRYDOCKS  
MARINE ENGINEERS • NAVAL ARCHITECTS  
CONSULTING ENGINEERS  
PORT WASHINGTON NEW YORK 11050  
(516) 883-2830 TELEX 14-4674 CABLE: "CEFOSTA"

**GIBBS & COX INC**  
NAVAL ARCHITECTS & MARINE ENGINEERS  
119 West 31st Street • New York, N.Y. 10001  
(212) 613-1300

**JOHN W. GILBERT ASSOCIATES, INC.**  
Naval Architects  Marine Engineers  
66 LONG WHARF BOSTON, MASS. 02110  
(617) 523-8370

Naval Architects Seattle, WA  
Marine Engineers 206-624-7850  
Ocean Engineers Telex 32-1226

THE GLOSTEN ASSOCIATES, inc.

*Phillip Gresser Associates Ltd.*  
MARINE ENGINEERS  
CONSULTANTS & SURVEYORS  
3250 SOUTH OCEAN BLVD.  
PALM BEACH FLORIDA 33480 TEL: (305) 586-0813

**MORRIS GURALNICK ASSOCIATES, INC.**  
NAVAL ARCHITECTS MARINE ENGINEERS   
620 Folsom St., Suite 300, San Francisco, CA 94107  
Main Office: (415) 543-8650  
Ventura Office: (805) 656-2322  
East Coast: (703) 471-7534

**J. J. HENRY CO. INC.**  
naval architects • marine engineers • marine consultants  
40 EXCHANGE PLACE  
NEW YORK, N.Y. 10005  
TEL (212) 635-4000  
TWX 710-581-2021, TELEX 422-036  
Cohasset, Mass. (617) 383-9200 Moorestown, N.J. (609) 234-3880 Sturgeon Bay, Wis. (414) 743-8217

**HYTEST**  
LABORATORIES, INC.

P.O. Box 226 Buckingham, Virginia 23921  
(804) 969-4264

- Underwater Explosion Shock Testing (MIL-S-901)
- Fixture Design and Fabrication
- R & D Support
- East & West Coast Facilities
- Test Program Management
- Field Testing with Craft & Engineering Support
- Pitch and Roll Simulation to 20,000 Lbs.

**C. Raymond Hunt Associates, Inc.**  
High Speed Powerboat Design

69 Long Wharf - Boston, MA 02110  
Tel: (617) 742-5669/TX: BSTLX 294116 (Attn. Hunt)

**HYDROCOMP**

Naval Architects  
Marine Engineers  
Marine Design Computer Services

100 CUTTS ROAD  
PO BOX 866  
DURHAM, NH 03824  
(603) 868-2560

**INTRAMARINE, INC.**

MARINE ENGINEERS  
SURVEYORS  
CONSULTANTS

P.O. BOX 53043 JACKSONVILLE, FL 32201  
(904) 353-0828 TELEX: 56-8421  
ALSO NEW YORK HAMBURG PIRAEUS  
• HULL • MACHINERY • CARGO • YACHT SURVEYS

**JJH of Virginia**

• NAVAL ARCHITECTS • MARINE ENGINEERS • MARINE CONSULTANTS •

*'Quality First'*

CHERRY HILL, NJ 609-779-8025 PORTSMOUTH, VA 804-399-4096 ARLINGTON, VA 703-920-3435 NEWPORT NEWS, VA 804-873-0028

**R. D. Jacobs and Associates**  
Naval Architects • Marine Engineers  
Consulting Engineers

MARINE AND STATIONARY PROJECTS  
Marine Surveyors; Project Specifications and Designs;  
Energy Efficient Concepts  
Owner Representation Services; Machinery  
Casualty Investigations;  
Practical Engineering Economics Analyses

11405 MAIN ST., ROSCOE, IL 61073 815-623-6760

**JAMES S. KROGEN & CO., INC.**  
NAVAL ARCHITECTS & MARINE ENGINEERS

Tel. (305) 642-1368  
1515 N.W. 7th St., Suite 124, Miami, FL 33125

**RODNEY E. LAY & ASSOCIATES**  
NAVAL ARCHITECTS

NAVAL ARCHITECTS • MARINE ENGINEERS  
13891 Atlantic Blvd.  
Jacksonville, Florida 32225  
(904) 246-6438 TWX 810-828-6094

**Alan C. McClure Associates, Inc.**  
NAVAL ARCHITECTS • ENGINEERS

2600 South Gessner • Suite 504 • Houston, Texas 77063  
(713) 789-1840 • Telex 792397

**John J. McMullen Associates, Inc.**

**JJMA**

Naval Architects • Marine Engineers • Transportation Consultants

New York, NY • Arlington, Va • Newport News, Va • Houston, Tx  
Ventura, Ca • Bath, Me • Seattle, Wa • Pascagoula, Ms

One World Trade Center/Suite 3000/New York, New York 10048/(212)466-2200

Speed & Propulsion Power Policy

**FENDALL MARBURY**  
NAVAL ARCHITECT

1933 LINCOLN DRIVE  
ANNAPOLIS, MARYLAND 21401 (301) 268-6168

**MARINE CONSULTANTS & DESIGNERS, INC.**

Naval Architects Marine Engineers

Telex: 98-5587  
Main Off.: 308 Invest. Insur. Bldg. • Cleveland, Ohio 44114  
(216) 781-9070

**MARINE DESIGN, INC.**  
NAVAL ARCHITECTS • MARINE ENGINEERS  
Formerly TAMS INC. Naval Architects, Estb 1865

401 BROAD HOLLOW RD. (Rt. 110)  
MELVILLE, L.I., N.Y. 11747  
(516) 293-4336

**SPECIALISTS IN TUGS AND BARGES**

**MPA**  
MARINE POWER ASSOCIATES

THE PROFESSIONALS  
Maintenance, Repair & Retrofit Specialists

MARINE ENGINEERS 1010 Turquoise St., Ste. 217, P.O. Box 99546  
San Diego, CA 92109, (619) 488-7703

**MARITIME DESIGN, INC.**

NAVAL ARCHITECTS MARINE ENGINEERS  
MARINE CONSULTING COMPUTER PROCESSING  
MARINE DESIGN MARINE SURVEYS

2955 HARTLEY RD • JACKSONVILLE, FL 32217 • (904) 268-9137

**R. CARTER MORRELL**  
MARINE CONSULTANT

715 S. CHEROKEE  
BARTLESVILLE, OK 74003 918-336-8306

TELEPHONES: 943-7070 (943) 7071  
NIGHT MORRISTOWN, N.J. (201) 538-1799  
1WX 710-581-2872

**MOWBRAY'S**  
TUG AND BARGE SALES CORP.

21 WEST STREET, NEW YORK, N.Y. 10008  
YOUR MARINE CONSULTANTS

SPECIALISTS IN BUYING, SELLING AND RENTING TUG BOATS - BARGES CONTRACTORS FLOATING EQUIPMENT

**NELSON & ASSOCIATES, INC.**  
MARINE

SURVEYORS ENGINEERS CONSULTANTS APPRAISERS

610 N.W. 183 St., Miami, Fla. 33169 (305) 653-4884  
Telex: 44-1869 Cable: NELSURVEY

**Nickum & Spaulding Associates, Inc.**  
naval architects - marine engineers  
zone outfitting design  
marine consultants

2701 first avenue, seattle wa. 98121-1123  
(206) 728-4444 • Tlx: 320053

**NORTHERN MARINE**  
Naval Architecture - Marine Engineering  
Marine Surveying  
(616) 946-5959  
P.O. Box 1169 Traverse City, MI 49685

**OMEGA MARINE ENGINEERING SYSTEMS, INC.**  
NAVAL ARCHITECTS, MARINE AND STRUCTURAL ENGINEERS

11757 KATY FWY. HOUSTON, TEXAS 77079 TEL (713) 870-1111  
TELEX 6868507

**PILOTAGE CONSULTANTS, INC.**

Capt. Jim Stillwaggon 516-742-2467 P.O. Box 2046  
New Hyde Park, NY 11040

**Q.E.D. SYSTEMS, INC.** VIRGINIA BEACH (804) 490-5000

MARINE ENGINEERS NAVAL ARCHITECTS  
LOGISTICS ENGINEERS

ARLINGTON BREMERTON JACKSONVILLE SAN DIEGO PHILADELPHIA LAKEHURST CHARLESTON SAN FRANCISCO

**M. ROSENBLATT & SON, INC.**  
NAVAL ARCHITECTS AND MARINE ENGINEERS

New York City 350 Broadway 212-431-6900 San Diego 1007 Fifth Avenue (619) 238-1300  
San Francisco 66 Mission Street (415) 777-0500 Charleston Heights, S. C. 3370 Rivers Avenue 803-744-1688  
Arlington, Va 2341 Jefferson Davis Highway (703) 892-5680

M. ROSENBLATT & SON, INC.  
NAVAL ARCHITECTS AND MARINE ENGINEERS

**STV/SANDERS & THOMAS**  
Marine Engineering • Systems Analysis  
Consulting/Design Engineering

1745 Jefferson Davis Highway Arlington, VA 22202 703/521-5416

**SARGENT & HERKES, INC.**  
NAVAL ARCHITECTS • MARINE ENGINEERS

1005 INTERNATIONAL BLDG., 611 GRAVIER ST.  
NEW ORLEANS, LA. 70130  
(504) 524-1612

Quality Management, Training, Support,  
ILS, and Marine Engineering Services

**SEACOR**

23 Locations Worldwide

SYSTEMS ENGINEERING ASSOCIATES CORPORATION  
520 FELLOWSHIP ROAD, SUITE C-306  
MT. LAUREL, NEW JERSEY 08054  
(609) 866-2400

SEACOR is a Subsidiary of Day & Zimmermann, Inc.

*Seaworthy Systems, Inc.*

Marine Engineers and Naval Architects  
Energy Reduction Fuel Technology

Main Street  
Essex, Conn. 06426  
P.O. Box 205  
Solomons, MD 20688  
TWX: 7104580271

17 Battery Pl.  
N.Y. N.Y. 10004  
2 Skyline Place/Suite 311  
Falls Church, VA 22041

**GEORGE G. SHARP, INC.**

MARINE ENGINEERS  
NAVAL ARCHITECTS

SYSTEMS ANALYSTS  
MARINE SURVEYORS

100 Church Street  
New York, N. Y. 10007  
(212) 732-2800

Arlington, Virginia 22202  
(703) 892-4000

Virginia Beach, Va. 23462  
(804) 499-4125

Voorhees, N. J. 08043  
(609) 772-0888/89

• Marine Surveyors • Port Engineer Service • On-Off Hire Surveys  
• Damage Surveys • Voyage Repair Supervision • World Wide Travel

**SIMMONS ASSOCIATES**  
Naval Architects & Marine Engineers



P.O. BOX 760 • SARASOTA, FLORIDA 33578 • USA  
(813) 921-1231 \* TLX 9103808486

**R.A. STEARN INC.**  
NAVAL ARCHITECTS and MARINE ENGINEERS  
253 N. 1st Avenue  
Sturgeon Bay, WI 54235  
Phone (414) 743-8282 TLX 753166, ESL 62388810

*Trans-International Marine Services Corp.*



**TIMSCO**  
MAINTENANCE MONITORING SYSTEMS  
INVENTORY CONTROL SYSTEMS  
622 Azalea Road  
Mobile, Alabama 36609 205/666-7121

**Tracor Hydronautics**

INTEGRATED ENGINEERING SERVICES  
FOR THE MARINE INDUSTRY

RESEARCH • DEVELOPMENT  
DESIGN • TESTING

HYDRONAUTICS SHIP MODEL BASIN

**Tracor Hydronautics**  
7210 Pindell School Road  
Laurel, Maryland 20707  
Telephone: (301) 776-7454  
Telex: 8-7585

**VIBRANALYSIS ENGINEERING CORP.**

- PREDICTIVE MAINTENANCE PROGRAMS
- VIBRATION ANALYSIS
- FIELD & SHOP BALANCE
- ACOUSTICAL CONSULTANTS
- COMPUTERIZED DATA COLLECTION
- MARINE APPLICATIONS

**VIBRANALYSIS ENGINEERING CORP.**  
4380 S. Wayside, Suite 100  
Houston, TX 77087 713-643-1051

**THOMAS B. WILSON ASSOCIATES**  
NAVAL ARCHITECTS & MARINE ENGINEERS  
1258 N. AVALON BLVD. • WILMINGTON, CA. 90744  
PHONE (213) 518-0940

**Equipment Engineering Offers Hydraulic Disc Compression Tool—Free Literature Available**

Equipment Engineering of Indianapolis, Ind., manufacturers of centrifuge equipment and systems, is offering free literature on the new disc compression tool the company recently introduced to the market after two years of research and development. This challenge was posed by a number of industry leaders using centrifuges who were not satisfied with tools provided by original equipment manufacturers.

The new hydraulic disc compression tool is described as compact, lightweight, reliable, and factory calibrated (cannot over-compress). The text of the publication states that use of the tool will not only extend coupling ring life by minimizing thread wear but will also reduce downtime. It is rugged in design and has proven its worth in the most severe processes in a multitude of industries. Over 100 tools are currently in use.

In addition to descriptive text, the eight-page brochure contains a color picture of the compression tool, and gives such specifications as weight (12 pounds), dimensions (7 inches high by 7 inches long by 5 inches wide), and metallurgy (cast aluminum housing; wearing internals, hardened stainless). A partial list of users is also included.

For further information and your free copy of the eight-page color brochure on the new hydraulic disc compression tool from Equipment Engineering,

Circle 38 on Reader Service Card

**Free Eight-Page Full-Color Brochure Available From Standard Communications**

Standard Communications of Los Angeles, Calif., whose commitment to the marine marketplace now includes a full line of marine instruments for sail and power craft and sophisticated onboard desalination systems, is offering a free eight-page full-color brochure titled "Horizon Marine Products."

The publication is divided into four sections, each highlighting a particular product family: Marine Radios, Marine Handheld Radios, Horizon Marine Instruments, and HRO Systems Reverse Osmosis Desalinators.

Items in each section are well illustrated with exceptionally good color photos. The accompanying text gives descriptive information and lists facts and features, the latter being given in chart form for easy comparison in the sections on Marine Radios and Handheld Radios.

For a free copy of the eight-page full-color brochure from Standard Communications,

Circle 82 on Reader Service Card

**HBC BUILDS THE BEST BARGES.**

They're best because they are built by craftsmen using:

- sound construction details
- accurate, distortion free materials
- heavy-duty jigs and fixtures
- highest quality welding.

What's more, HBC has the versatility to build them to best suit the needs of your specific cargoes.

**HBC Barge**

Brownsville, Pennsylvania 15417  
Phone: 412/785-6100



Circle 277 on Reader Service Card

**Workboat buyers don't like to talk about Fish Expo**

Their competitors might learn just how valuable Fish Expo is. In fact, over half the exhibits overlap the workboat market and in a 800 booth show, that'll keep you busy for a while.

Whether you're looking for a good shipyard, deck gear manufacturer or the best supplier for handling equipment, you'll find them at Fish Expo. And Fish Expo probably has more marine electronics exhibits than any other commercial marine show.

The fact is that workboat buyers have been attending Fish Expo for years (all twenty of them). But they don't like to talk about it. You see, they think it gives them a competitive edge and this year, we're sharing the secret.

Sponsored by National Fisherman

**FISH EXPO '86**

October 15-18, 1986  
Bayside Exposition Center  
Boston, Massachusetts

For more information, contact:  
National Fisherman Expositions  
P.O. Box 7437 DTS, Portland, ME 04112  
(207) 772-3005

Circle 226 on Reader Service Card

**JOINER DOORS**

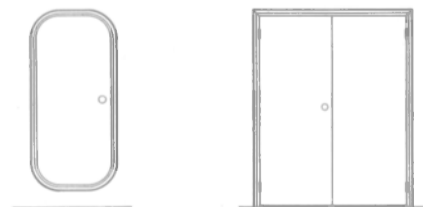
THE NAVY'S LIGHTEST AND STRONGEST JOINER DOORS - IN STOCK

Lightweight Honeycomb Doors  
(Meets U.S. Navy Specs)



TYPE 1 TYPE 2 TYPE 3

- \* Aluminum Honeycomb
- \* CRES Honeycomb
- \* GRP/Nomex® Aramid
- \* Steel Honeycomb



TYPE 4 DOUBLE DOOR

**ADVANCED STRUCTURES CORP.**

235 WEST INDUSTRY COURT  
DEER PARK, NEW YORK 11729  
(516) 667-5000

NOMEX® ARAMID IS A TRADEMARK OF DUPONT  
Circle 245 on Reader Service Card

# AUCTION

## COMPLETE LIQUIDATION OF KENNER SHIPYARD MARINE, CONSTRUCTION & MACHINE TOOLS

THURSDAY, SEPTEMBER 11TH 10:00 A.M.  
KENNER (NEW ORLEANS), LOUISIANA

NO MINIMUMS OR RESERVATIONS

**WORK BOAT:** '82 RIGGER III, 64' x 36' x 7', w/15-Ton Hyd. Crane, 2) Detroit 671 Diesels, Crew Quarters; **PUSH BOAT:** DWARF KING, 40' x 14' x 4' w/2) Detroit 6-71 Diesels, 20 KW Gen. Set, w/Detroit 2-71 Diesel; **BARGES:** OFFICE/SHOP BARGE, 195' x 45' x 8' w/Top-Mounted Dispatch Office; 8) **FLAT-DECK BARGES:** 224' x 44' x 10', 110' x 30' x 5', 50' x 20' x 5', 30' x 16' x 3', 2) 36' x 18' x 3', 2) 28' x 14' x 2'6"; **DRY DOCKS:** 2) **ELECT. BARGE DRY DOCK**, 147' x 48', 145' x 47' w/6) ea. Vertical Turbine Pumps; **ACCESSORIES:** Hoist & Derrick, Winches, Open Chocks, Cast Enamel and Primer, Button Chocks, Kevel Chocks, Barge Kevels, Double and Single Bits; **CRAWLER CRANES:** 2) **LINKBELT LS98**, S/N's 9LR4242, and 9LR2110, w/3rd Drum, Power Lowering, 60' Lattice Type Boom, Detroit 4-71 Diesel; **HYDRAULIC CRANES:** GROVE RT-60S, S/N 33576, w/Swing Cab, Hyd. Outriggers, Enclosed Cab, 60' Boom w/20' Jib, Cummins V504 Diesel; AUSTIN WESTERN V410FR, S/N V410R7448, w/Hyd. Outriggers, Canopy, Detroit 453 Diesel; **RUBBER TIRED LOADERS:** FORD 4500, S/N C346964, with 1/2 Yard Bucket, Canopy, Ford Diesel; I.H.C. 1-240PL, S/N 2230153B100500-X, with 1/2 Yard Bucket, Semi Enclosed R.O.P.S., IHC 3-Cyl. Diesel; **ACCESSORIES:** Brush Hog; Box Blade w/Multi Shank Ripper; 2) 1-1/2 Yard Drag Line Buckets; 5/8 Yard Clam Shell Bucket; 2500 Lb. Hammer & Sollow Block; '81 PACIFIC K750-22 Press Brake, S/N 8833, 750-Ton Cap., 2200 H.P.; CINCINATTI 2512 Shear w/12' Bed, Conveyor; 2) JET 420 Drill Presses; Threading Machine w/Pipe Cutter; Dies, Die Heads, Pipe Cutters; Hole Punch w/Shear; Hi-Speed Saw; **WELDERS:** 1) LINCOLN SAE 400 w/Detroit 2-71; 1) MILLER BIG D4 w/Perkins 4-154; 15) AIRCO 400 Amp. Elect.; 16) MILLER 400 Amp. Elect.; 4) LINDE Elect.; 7) HOBART 1553; **SUPPLIES:** Torches and Tips; Asst. Electrodes; Gauges; Hoses; Leads and Miscellaneous; **WATER PUMPS:** 16) GORMAN RUPP & HOMELITE 2" to 4" Gas & Elect. Cent. Pumps; **AIR COMPS.:** SULLAIR 650E w/150 H.P. Elect. Motor; SEARS 321 w/2 H.P. Elect. Motor; **PARTS & SUPPLIES:** Lots of Nuts, Bolts, Fittings, Elect. Connections, Filters; **SHOP TOOLS;** **MISC. STEEL:** Lot of Plate; Angle; Round Stock; Flat Bar, Asst. Sizes; **RADIO EQUIPMENT:** Bases, Antenna, Hand Held Radios, Chargers; **DETECTION METERS & GAUGES;** **LOTS OF OFFICE FURNITURE & SUPPLIES.**

GENE SMART, PRESIDENT

CLAUDE THOMAS, AUCTIONEER  
LOUISIANA LICENSE #: 6238687

CALL OR WRITE FOR DESCRIPTIVE BROCHURE: 405-842-0920

# EBCO

AUCTIONEERS, INC.

FULLY INSURED AND BONDED

P.O. Box 14008 • Oklahoma City, Oklahoma 73113

# CLASSIFIED AND EMPLOYMENT ADVERTISING

**HOW TO PLACE CLASSIFIED ADVERTISING:** Mail clearly written or typed copy to: MARITIME REPORTER, 118 East 25th Street, New York, NY 10010. Include any photos, drawings or logos if required. Specify size of ad and number of insertions . . . Classified Advertising — Per Issue Rate: Classified advertising is sold at a rate of \$70 per column inch . . . MARITIME REPORTER'S classified section carries more advertising and sells more products than any other publication in the marine industry. Closing date for classified advertising is 20 days prior to the date of the issue. For further details contact John C. O'Malley at (212) 477-6700. Send all advertising material to MARITIME REPORTER And Engineering News, 118 East 25th Street, New York, NY 10010.

## MANAGEMENT OPPORTUNITIES! SHIPBUILDING—SHIP REPAIR

ENGINEERING MANAGER  
CHIEF NAVAL ARCHITECT  
MANAGER, PROPULSION SYSTEMS  
ESTIMATING MANAGER  
SENIOR ESTIMATORS  
PURCHASING MANAGER  
PRODUCTION MANAGER  
SHIP SUPERINTENDENT  
GENERAL MANAGER (NAVAL REPAIRS)

We specialize in recruiting key management personnel for the shipbuilding and ship repair industry. All fees and expenses are company paid. The above positions, and many others, are now open. Call Mr. M. A. Weeks at (205) 661-2294 as soon as possible or send resume immediately!

WEEKS AND ASSOCIATES  
Management Consultants  
921 Cottage Hill Avenue, Mobile Alabama 36609

Ship Repair Representative in Norfolk—Newport News area—Prefer individual with established record with Navy and Marad.

Box 902 MARITIME REPORTER  
118 East 25th Street New York, NY 10010

## Contract Administrator/ Senior Estimator

Dillingham Ship Repair is conducting a Nationwide search for a Contract Administrator. This position reports directly to the V.P. of Contract Administration and will be responsible for the total contract administration process. Responsibilities will include preparation and development of contract proposals, estimating, establishment of budget and cost control schedules, maintenance of contract administration and customer relations. Additionally, this position has the responsibility for compilation and preparation of documents for invoicing and negotiation of the final settlement.

Qualified applicants should have 5 years experience in contract administration including the repair of Product and Crude Tankers. Navy and Cruise Vessel experience a plus.

DSR is a dynamic company located in the beautiful Pacific Northwest. Compensation is commensurate w/exp. and includes a competitive benefit package that includes profit sharing.

For confidential consideration, please send a cover letter with salary requirements and a resume to:

Employment Manager  
P.O. Box 4367  
Portland, OR 97208  
(503) 285-1111



**Dillingham Ship Repair**  
Equal Opportunity Employer

## DESIGNERS/DRAFTERS/ENGINEERS

**Our tradition of excellence continues... Come launch new success designing the world's best ships.**

Work in a professional environment where dedication to quality is complemented by innovation. Opportunities for **Designers, Drafters, Engineers in the following disciplines: Civil/Structural, Piping, Mechanical, Electrical, Marine Engineering/Naval Architecture**, at various levels to work on major U.S. Navy ship design programs. MARINE EXPERIENCE DESIRABLE.

Set your career on course with comprehensive benefits . . . including tuition refund in an environment where performance is the only criterion for opportunity. Apply in person, send resume or call:

(212) 613-1351  
**GIBBS & COX, INC.**  
119 West 31st Street  
New York, N.Y. 10001



U.S. CITIZENSHIP REQUIRED  
Equal Opportunity Employer M/F/H/V

U.S. Department  
of Transportation  
**United States  
Coast Guard**



## NAVAL ARCHITECT

The Naval Engineering Division, Design Branch is seeking a Naval Architect (Arrangements Specialist) responsible for the coordination of the General Arrangements of the Coast Guard's cutters and icebreakers. CAD experience is desirable. Position is also responsible for fire containment systems, cathodic protection and paint systems, and resistance predictions. For further information contact:

Commandant (G-CAS-5) Room 3418  
U.S. Coast Guard Headquarters  
2100 Second St., S.W.  
Washington, DC 20593

ATTN: Ms. Shirley Bennett  
(202) 426-2330

\* This position is promotable from within.

EQUAL OPPORTUNITY/AFFIRMATIVE  
ACTION EMPLOYER

## MASTER FOREIGN GOING

With excellent work record and references; available for a ship delivery for a modest fee, and would consider any Marine related position. Phone any time: (604) 758-0391

MARINE SUPERINTENDENT for Houston offices of shipping company operating petrochemical parcel tankers. Responsibilities include: continuous updating of Korean crew-management contractor on U.S. Coast Guard Regs.; advising world-wide offices (especially Tokyo) of changes in U.S. Coast Guard Regs.; providing liaison (in Korean language) with Ship's Masters while in U.S. ports and waters to ensure performance of ship and crew meet all U.S. regulatory requirements (EPA, TOSCA, OSHA) and laws; attending company's vessels at any port where loading or unloading hazardous cargoes to ensure maintenance of maximum safety; advising ship charterers (Japanese) on proper handling and cargo adjacencies to comply with U.S. and international regs.; monitoring ship performance data such as speed/fuel consumption correlations; counseling ship's Masters on upgrading officer and crew performance; advising Company's local charterers on technical aspects of chemical tanker operations; communicating via telex and radio with ship's Masters (in Korean language) regarding last minute changes in routings, cargo liftings and off-loadings. Must be fluent in English and Korean and also speak Japanese. Degree in Marine or Nautical Science required with min. 5 yrs. experience, including min. 2 as master of ocean-going vessel and min. 2 as Marine Superintendent dealing with operating hazardous liquids ships. Salary \$2,500 per month. Apply at the Texas Employment Commission, Houston, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J. O. #4510279. Ad Paid by An Equal Opportunity Employer.

## PORT CAPTAIN

New York-based steam-ship company requires an experienced Port Captain to direct and monitor performance of U.S.-Flag Tankers and Bulk Carriers mainly in the Gulf of Mexico, West Coast area.

The candidate should have U.S. Coast Guard master license and minimum five years experience in shoreside marine operations plus seagoing tanker experience as a master or chief officer on U.S.-Flag vessels.

Our employees are aware of this position.

Send complete resume and salary history in confidence to:

Box 904 MARITIME REPORTER  
118 East 25th Street New York, NY 10010

## WANTED MARINE ENGINEER & FERRY PILOT

VIRGINIA DEPARTMENT OF HIGHWAYS  
& TRANSPORTATION  
Waverly Residency  
NEEDS

RIVER FERRY ENGINEERS  
&  
RIVER FERRY PILOTS

at  
Jamestown-Scotland Ferry  
Near Williamsburg & Major  
Military Installations in the Area

### RIVER FERRY ENGINEER

QUALIFICATIONS: Must hold U.S. Coast Guard License as Chief Engineer of an inspected vessel propelled by a diesel engine of at least 1600 horsepower. Physical ability to attend to boat operations and respond to emergencies.

### RIVER FERRY PILOT

QUALIFICATIONS: Must hold U.S. Coast Guard License as master and first class Pilot of ferryboats of at least 1000 gross tons on inland waters. Physical ability to attend to boat operations and respond to emergencies.

### BASE SALARY: Up to \$26,160

Any time worked over 40 hours per week compensated for at 1½ times the hourly rate for the Base Salary shown above.

FRINGE BENEFITS: Vacation; sick leave; State paid retirement, group life insurance, and hospital insurance

CALL 804-834-2333 for appointment for interview or write: Resident Engineer, Virginia Dept. of Highways & Transportation, P.O. Box 45, Waverly, Va. 23890-0045

AN EQUAL OPPORTUNITY EMPLOYER

**CHARTERING MANAGER.** Manages ship chartering department of company engaged in procurement of specialized cargo contracts (reactor vessels, cranes, modules, pile hammers, off-shore units, jetfoils, etc.) for fleet of heavy-lift vessels and some conventional vessels, tugs, and barges; sets new goals and targets; performs market studies; trains personnel; negotiates directly with shipowning and broker markets in major shipping centers around the world for short- and long-term chartering in of vessels, tugs, and barges to perform specialized cargo transportation, utilizing knowledge of standard international contracts customarily used in the trade. 40 hrs/wk. \$51,000/yr. Requires 3 yrs. exp. in the job offered. Requires (1) exp. negotiating directly with international shipowning and broker markets for chartering in of heavy-lift and conventional vessels, tugs, barges; (2) knowledge of specialized heavy cargo transport; (3) exp. in market studies; (4) exp. working with upper-level management personnel and training personnel; (5) knowledge of standard international contracts customarily used in the trade. Apply at Texas Employment Commission, Houston, Texas or send resume to Texas Employment Commission, TEC Building, Austin, Texas, J.O. #4642460. Ad Paid by An Equal Employment Opportunity Employer.

Estimator, Full time—experienced individual with proven track record wanted by Ship Repair Company in New York Area.

Box 901 MARITIME REPORTER  
118 East 25th Street New York, NY 10010

## PORT ENGINEERS

American Systems Engineering Corporation has openings for experienced Port Engineers. Our Port Engineers maintain selected U.S. Navy ships in a Phased Maintenance Program.

Applicants should be degreed Marine Engineers holding USCG Engineer's License. U.S. citizenship is required.

Positions available in Honolulu, Hawaii; Long Beach, CA; Charleston, SC; Mayport, FL.

Send resume and salary requirements to:

American Systems  
Engineering Corporation  
Box 8988  
Virginia Beach, VA 23452

## MASTER OF SCIENCE IN MARITIME MANAGEMENT

MAINE MARITIME ACADEMY, A COLLEGE OF ENGINEERING, TRANSPORTATION AND MANAGEMENT, offers a modular graduate degree program in management of marine-related organizations.

Designed for people who want to advance their careers in maritime industries.

Modular design allows study without career interruption.

For additional information call or write Mrs. Doris Richardson, Executive Secretary, Department of Graduate Studies (A-6), Maine Maritime Academy, Castine, Maine 04420 USA, telephone (207) 326-4311 extension 485.

**SALES:** Academy grad, proven ability, stable record, good contacts. Prefer an incentive/commission affiliation with a smaller organization (domestic or foreign) looking to open up U.S. marine markets and/or achieve prompt sales results for new product or service. For earliest contact, send phone number to:

Box 903 MARITIME REPORTER  
118 East 25th Street New York, NY 10010

## ENGINEERS/DESIGNERS

Growing Naval Architecture and Marine Engineering firm needs Engineers and Designers for their Seattle and Bremerton offices in the areas of:

### ELECTRICAL/ELECTRONICS PIPING/HVAC

### NAVAL ARCHITECTURE/STRUCTURAL

Competitive starting salaries, comprehensive benefit program. Experience required in U.S. Navy ship design. Send resume to: Vice President Operations, West

### CDI MARINE COMPANY

920 Park Ave., Bremerton, WA 98310  
U.S. Citizenship Required  
EOE M/F/H/V

## ASSISTANT/ASSOCIATE PROFESSOR

TEACH UNDERGRADUATE COURSES IN SEAMANSHIP, NAVIGATION, CARGO AND RELATED NAUTICAL SCIENCE SUBJECTS. MS DEGREE AND MARINE LICENSE PREFERRED. SELECTION EXPECTED TO BE MADE BY START OF 2ND ACADEMIC QUARTER (10/16/86) OR, IF NOT POSSIBLE, BY END OF DECEMBER, 1986. SEND RESUME TO: PROFESSOR R. J. MEURN, DEPT. OF MARINE TRANSPORTATION, U.S. MERCHANT MARINE ACADEMY, KINGS POINT, NY 11024. AN EQUAL OPPORTUNITY EMPLOYER.

## MARINE ENGINEER

41; B.Sc.; 20 yrs. substantial experience with operation, maintenance, repair and construction of ships seeking responsible position in Japan/Korea supervising construction of new buildings/managing operation, maintenance of existing vessels. Available from Oct. 1986. C.V. and references upon request.

Box 706 MARITIME REPORTER  
118 East 25th Street New York, NY 10010

## SENIOR MARINE MANAGER SEEKS POSITION

Twenty years of solid manufacturing, engineering and marketing experience in the marine industry. Seeks a challenging position requiring similar experience and with additional previous experience in strategic and operational planning, resource utilization and product design and introduction. Experienced with government contract and proposal requirements. P and L responsibility. Resume upon request.

Box 803 MARITIME REPORTER  
118 East 25th Street New York, NY 10010

### FOR SALE:

12 Uniflote barges 17'4" x 8' x 4' ..... Can \$84,000.00  
3500' "Bennett" oil booms x 36" ..... Can 25,000.00  
1350' "Flexi" oil booms x 36" ..... Can 9,000.00  
1350' "Slickbar" oil booms x 14" ..... Can 4,000.00  
16 U.S. army "Good Year" pneumatics 23' x 3'  
Four compartments each ..... Can \$20,000.00  
BARGES LONGUEUIL, C.P. 614, Montreal H3C2T8. Tel: (514) 463-2624.

### FOR LEASE PURCHASE—SALE

1—M/V HEL-LYN PUSHBOAT 65' x 24' 9"5" DEPTH; TWIN GM—16V-92 DIESEL; TWIN DISC MG520 W6.11-1; TWIN GENERATORS 4-71 WITH 30 KW GENERATOR SET. FOUR FLANKING RUDDERS. ALL MARINE ALUMINUM CONST. CUT RUBBER BUMPER ON PERIMETER OF VESSEL. ASKING \$500,000—FINANCING AVAILABLE

M/V SHANE-T—51'7" x 22'1" x 9'0"; TWIN GM—16V-71; TWIN 3-71 DIESEL-OPR-30 KW GENERATORS; TWIN DISC—527—RESERVE GEAR WITH 5.17-1 RATIO AND HYD CLUTCH; FOUR FLANKING RUDDERS; RUBBER BUMPER SYSTEM. EXCELLENT CONDITION. ASKING \$295,000—FINANCING AVAILABLE.

CALL OR WRITE M. HUTTER, 504/586-9191  
P.O. BOX 10507, NEW ORLEANS, LA 70181


Mt. Hope & Narragansett Bays  
**DOCKING & COASTAL TOWING**  
All Diesel Fleet  
**PROVIDENCE STEAMBOAT COMPANY**  
1 India St., Providence, RI 02903  
401-331-1930

## \*\*ATTENTION\*\*

### OWNER OPERATORS SHIP DOCKING FRANCHISES AVAILABLE

We supply the contracts and the contacts, and legal services to set you up in the ship docking business in any U. S. Port. We need owner operators ONLY that have at least two 1,800 H.P. tugs with the desire to move into the highly lucrative ship docking business.

We will train your docking pilots and your crews in the fine art of ship handling. WE HAVE 2 EAST COAST PORTS AVAILABLE IMMEDIATELY THAT WE CAN GUARANTEE 50% OF THE SHIP DOCKING BUSINESS (\$1,000,000 ANNUAL SALES). We have a proven track record of success. Write: TOWBOATS, c/o Box 801, Maritime Reporter, 118 East 25th Street, New York, NY 10010.



## MARINE SURVEY SEMINAR

Instruction by world-famous experts  
will benefit practitioners and beginners in  
"THE BUSINESS OF MARINE SURVEYING"

<p><b>FACULTY</b></p> <p><b>IAN NICOLSON</b>, world-famous surveyor &amp; author of "Surveying Small Craft" &amp; 16 other maritime publications</p> <p><b>Giffy Full</b>, famous wooden boat surveyor</p> <p><b>Roderick Stephens, Jr.</b>, Chairman, Sparkman &amp; Stephens</p> <p><b>Professor Peter Throckmorton</b>, author &amp; marine archaeologist</p> <p><b>Capt. Jeffrey A. Johnson</b>, internationally recognized surveyor</p>	<p><b>TOPICS</b></p> <p>Introduction to Surveying</p> <p>Surveyors' Responsibilities</p> <p>The Business of Marine Surveying</p> <p>Forms &amp; Office Procedures</p> <p>Nicholson's Techniques</p> <p>Stability &amp; Design</p> <p>Insurance Forms</p> <p>Claims &amp; Investigations</p> <p>Testing Equipment</p> <p>Standards &amp; Publications</p> <p>Specific Survey Techniques and other topics</p>
--	---

Certificates of Completion awarded

For more information contact:  
J.A. Johnson & Associates  
Box 2052 Brunswick, Maine 04011  
(207) 729-6711 Telex 469162  
Limited Space Available

October 23, 24, 25, 26 1986  
Brunswick, Maine

## DONATE YOUR BOAT ETC. THIS MAY BE YOUR LAST CHANCE TO SAVE ON TAXES

Before Proposed New Tax Change  
For More info: Call A.R.M.  
1-800-527-0244 or in Texas 409-833-5744

## SERVICE • REPAIR • PARTS CONSULTING • DESIGN

### CUNNINGHAM MARINE HYDRAULICS CO., INC.

201 Harrison St. • Hoboken, N.J. 07030  
(201) 792-0500 (212) 267-0328

2030 E. Adams St. • Jacksonville, FL 32202  
(904) 354-0840

TWX 710-730-5224 CMH Hoboken, NJ





For Barge Rentals or a  
Complete Marine Package

## Call the Barge People.

Our experience and knowledge in serving a wide variety of industries enables us to provide the right size and type of barge and tow to make your marine operations profitable.

- Large, diversified fleet for inland, oceans and speciality service
- Experience in arranging and managing marine packages.
- 20 convenient fleet locations along Gulf Coast and upper river.

Rentals - Sales - Service

**New Orleans**  
(504) 949-7586  
Telex 58-4393  
2300 Surekote Rd  
N O . LA 70117

**Houston**  
(713) 452-5887

**Parkersburg**  
(304) 485-4494

**St. Louis**  
(314) 469-0510



**Free Heavy Duty Flexible Reach Rod  
Brochure** describing mechanical  
valve control from a remote station.

Write or call 201-752-8300.  
**S. S. WHITE INDUSTRIAL PRODUCTS**  
151 Old New Brunswick Road, Dept-M  
Piscataway, NJ 08854.



Special U.S. Startup Services for  
**GERMAN MARINE MANUFACTURERS**  
TECHNICAL & COMMERCIAL

- System Integration
- Compliance Design
- Government Certifications
- Market Positioning
- Sales & Service Network
- Literature & Documentation

**WOLFGANG SCHLEGEL**

48 OLD STAGE ROAD W. HATFIELD MA., 01088  
(413) 247-5419

Save 75%

**Monroe Min-Ranger**

Automatic Positioning System

Used 3 months only

contact Larry Danner

(412) 963-8215

### PORT OF SINGAPORE

and neighboring ports

We provide efficient and economic services to shipowners/operators worldwide: \* Full Ship Agency Services \* Ship management \* Stores/Spares Supplies \* Bunkering \* Deslopping at Offport Limits \* Technical Services \* Crew Recruitments \* Brokerage \* Appointed Special Agent for Vanuatu Registration/Maritime Services



**RICHFIELD MARINE AGENCIES (S) PTE LTD**

(A Subsidiary of QAF Ltd)  
10 Anson Road, #19-04A  
International Plaza, Singapore 0207  
Tel: 2250133, Telefax: 2257115  
Tlx: RS 55622 Riship, Cable: Sealift  
24 Hours Answering Tel: 5330088  
Person to Contact: C.C. TAN

## Inmarsat Systems

For Sale or Lease  
New and Used

Scientific-Atlanta  
3055M & 3055MS  
Telesystems MCS-9100

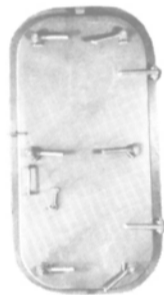
Complete Installation,  
Commissioning & Service

Call for Quotes - (318) 232-9610

**AUTO-COMM**  
3014 Cameron St.  
Lafayette, LA 70506

### NEW WATERTIGHT DOORS IN STOCK

SIZES		
26"x48"	5/16" Frame	26"x66"
26"x60"	1/4" Panel	30"x60"



#### STEEL DOGS

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

**LEVER OPERATED OR WHEEL  
OPERATED DOORS AVAILABLE**  
26"x48" 26"x60" 26"x66" 30"x60"



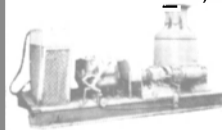
#### NEW 7" RADIUS PANAMA CHOCKS (MEET PANAMA REGULATIONS)

14"x10" CLEAR OPENING  
With extended legs for welding to deck, 14" wide on base—length 28"—height 27 1/4". IMMEDIATE DELIVERY FROM STOCK.  
12" x 10" IN STOCK

#### EXTRA LARGE HEAVY DUTY CHOCK

Clear opening—16"x22"—10" radius. 40" Long-36" high.

#### 24" PORTABLE DOCK CAPSTAN 20,000 LBS @ 40 FPM



With magnetic brake and controls. 33 HP—230 VDC. Spool diam 16"—26" high. Base: 11'4" long-60" wide—OAH 69". Self-contained, in good running condition. Just purchased from Newport News Shipbuilding. very versatile unit.

#### INQUIRE ABOUT OTHER MARINE ITEMS

Hard to find Turbo Generators, Cargo Pumps, Winches, Hatches, Bits, Cleats, Axial Flow Flans, Valves, etc

**THE BOSTON METALS COMPANY**

233 E. Redwood St.—(301) 539-1900—Baltimore, Md. 21202  
Marine Warehouse (301)-752-1077

### LaGrange And Wyne Appointed At Louisiana Dock's Harahan Yard

**Robert W. Greene**, executive vice president of Louisiana Dock Company, has announced the appointments of **Wayne P. LaGrange** as Harahan shipyard manager, and **Garrold L. Wyne** as shipyard supervisor.

Mr. LaGrange will have operational responsibility for the Harahan Shipyard, which serves customers operating on the Lower Mississippi River and Gulf Intracoastal Waterway. He previously held the position of vice president-production at Jeffboat, Incorporated, and will have continuing responsibilities for the Marine Repair Division of Jeffboat.

Mr. Wyne will support the Harahan operation with his expertise in towboat and specialty vessel construction. He previously was superintendent-towboat construction at Jeffboat.

Louisiana Dock Company offers full-service marine repair capabilities, with shipyards located at Wood River, Ill., and Harahan, La.

For free literature on LDC's facilities and capabilities,

Circle 81 on Reader Service Card

### American Hawaii Cruises Names Bennett And Thomason To Senior Management Posts

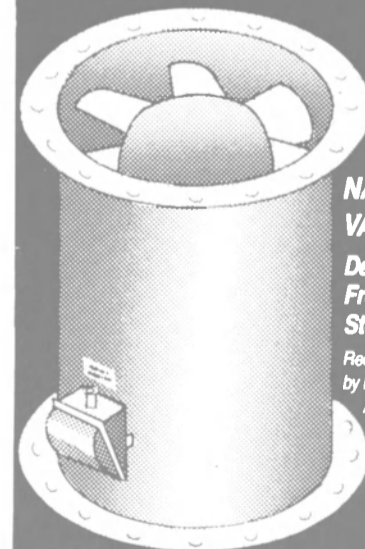
American Hawaii Cruises recently announced two senior management appointments: **Peter J. Bennett** to executive vice president and chief operating officer, and **George W. Thomason** to senior vice president and chief financial officer. The announcement was made by **Conrad Everhard**, president and chief executive officer for the line.

Mr. Bennett joins American Hawaii from London-based Furness Withy Terminals Ltd., where he served as managing director. His specific responsibilities included overall profitability, monitoring financial and operational performance and developing new business opportunities. Mr. Bennett also served as director of Long Beach Container Terminal, Inc. of Long Beach, Calif.; Clark Maryland Terminal, Inc. of Baltimore; Liberty Intermodal, Inc. of New York and Halterm Limited of Halifax, Nova Scotia.

Mr. Thomason was promoted to his new post from within the company; he previously served as vice president and controller for American Hawaii. The former ITEL Corporation executive joined the cruise line in September 1985.

### JON M. LISS ASSOCIATES, INC.

411 BOREL AVENUE, SUITE 505 - POST OFFICE BOX 5554 - SAN MATEO, CALIFORNIA 94402-0554



**NAVY STANDARD  
VANEAXIAL FANS**

Delivery  
From  
Stock

Reconditioning and Rewinding  
by Dahl Beck Electric.  
Available with Warranty.

(415) 573-9191

TELEX 17-2655 GOJON SMT.

# FOR MORE INFORMATION ON EQUIPMENT AND SERVICES ADVERTISED IN THIS ISSUE

CIRCLE THE APPROPRIATE NUMBER ON READER SERVICE CARD OPPOSITE →

ADVERTISER	EQUIPMENT CIRCLE /SERVICE	NO.
ADVANCED STRUCTURES	DOORS	245
ADVANCED STRUCTURES	PANELS	246
AMERICAN MANUFACTURING	ROPE	300
AMERICAN PIPING PRODUCTS	VALVES	201
BMV BERGEN DIESEL	DIESEL ENGINES	110
BAILEY DISTRIBUTORS	AIR CONDITIONING/REFRIGERATION SYSTEMS	106
BOSTIK CO.	ANTI-SEIZE LUBRICATING COMPOUNDS	108
CENTRICO	OIL PURIFIER	230
A.W. CHESTERTON	METAL REPAIR SYSTEM	112
COMBUSTION ENGINEERING	WASTE HEAT RECOVERY PRODUCTS	206
COMSAT	SHIPBOARD COMMUNICATIONS	140
CONFERENCE SECRETARIAT/GASTECH 86	TRADE SHOW	119
CRANDALL DRYDOCK	CONSULTING SERVICES	142
CRAWFORD FITTINGS/CAJON	PIPE FITTINGS	167
CUMMINS	DIESEL ENGINES	320
DEL GAVIO MARINE	HYDRAULICS	155
FRED DEVINE DIVING & SALVAGE	DIVING/SALVAGE	187
DREW AMERIOD MARINE	CORROSION CONTROL	175
ELDEC	ELECTRONIC EQUIPMENT	152
ENGELHARD CORP	ANODES	134
ENTERPRISE MARINE	SHIPREPAIR	114
ENVIROVAC	E-VAC SEWAGE SYSTEMS	200
EQUIPMENT ENGINEERING	CENTRIFUGES/SEPARATOR/PURIFIER	170
R.W. FERNSTRUM	GRIDCOOLER	165
FINCANTIERI CANTIERI NAVALI ITALIANI	SHIPBUILDING/REPAIR	275
FISHER SCIENTIFIC	CAT TAN/TBN SYSTEM	111
GAYLORD INDUSTRIES	GALLEY EXHAUST HOODS	156
GENERAL THERMODYNAMICS	DIESEL ENGINE ACCESSORIES	105
GREITZER, INC.	GALLEY EQUIPMENT	145
HBC	BARGE BUILDING/REPAIR	277
HAMBURG MESSE/SMM 86	TRADE SHOW	121
HARDWARE SPECIALTY	MARINE EQUIPMENT	158
HENSCHEL CORP.	SHIPBOARD ANNOUNCING SYSTEM	172
HITACHI ZOSEN	ENGINEERING SERVICES	178
INFRASONIK	BOILER CLEANING	107
INVENTORY LOCATOR SERVICE	ELECTRONIC INFORMATION SYSTEM	225
JIM'S PUMP	PUMP SERVICE/REPAIR	195
KEARFOTT MARINE	WINDOWS/DOORS	205
LISNAVE	SHIP REPAIR	305

ADVERTISER	EQUIPMENT CIRCLE /SERVICE	NO.
McCAUSEY LUMBER	MARINE LUMBER	253
MacGREGOR-NAVIRE	CARGO ACCESS EQUIPMENT	150
MAN-B&W DIESEL	DIESEL ENGINES	280
MARCO	OIL SKIMMERS	350
MARINE SAFETY INTERNATIONAL	MARINE SIMULATION/TRAINING	186
MARITIME POWER	MARINE EQUIPMENT	189
MARKISCHE WERKE	DIESEL ACCESSORIES	163
MILLER ELECTRIC	WELDING SYSTEMS	223
L.Q. MOFFITT	BEARINGS	197
NATIONAL FISHERMAN EXPOSITIONS/FISH-EXPO	TRADE SHOW	226
NAVAL ELECTRONICS	COMMUNICATIONS EQUIPMENT	193
J.D. NEUHAUS	AIRHOISTS	207
NEVADA BOLT	FASTENERS	252
NEWPORT NEWS SHIPBUILDING	SHIPBUILDING/REPAIR	250
OCEAN FLEETS SERVICES	OIL TESTING SERVICES	333
OMNITHRUSTER	THRUSTERS	288
ORIENTAL INDUSTRY	SCALE MODELS	259
PEARLSON	SHIFTLIFT SYSTEMS	115
PRODUCTS RESEARCH & CHEMICALS	MARINE COATINGS	257
RIVA CALZONI	WATERJET PROPULSION SYSTEMS	254
ROBINSON INDUSTRIES	PORTABLE VENTILATION FANS	182
ROCKY MOUNTAIN ENERGY	ABRASIVE BLASTING MATERIAL	196
SKF COUPLING DIVISION	COUPLINGS/BOLTS	168
S.N.A.M.E./INTERNATIONAL		
MARITIME EXPOSITION	TRADE SHOW	126
SCHOETTEL WERFT	PROPULSION SYSTEMS	160
S.P. RADIO	COMMUNICATIONS EQUIPMENT	271
SIEMENS	AUTOMATED MONITORING SYSTEMS	210
SOUTHWEST MARINE	SHIPBUILDING REPAIR	237
STACEY/FETTEROLF	LINE BLINDS	211
SUDOIMPORT	SHIPBUILDING	124
SURVIVAL INTERNATIONAL	SURVIVAL SUITS	137
TEXACO	MARINE LUBRICANTS/BUNKER FUELS	276
TRANSAMERICA DELAVAL/CORPORATE	MARINE COMPONENTS	
	IN EUROPE	219
	IN US	220
TRANSAMERICA DELAVAL/PYRAMID PUMP	FOS/LOS PUMPS	177
TROY CO.	FASTENERS	285
WASHINGTON CHAIN & SUPPLY	CHAIN	227



The recently delivered Mississippi Belle II is powered by three Cummins KTA19-M diesel engines

## Patti Shipyard Delivers Excursion Vessel 'Mississippi Belle II'

Patti Shipyard, Inc. of Pennsacola, Fla., is well known as a builder of towboats, crabbers, tugs, and fishing trawlers. Within the past two years, however, Patti has delivered two 800-passenger excursion vessels to Roberts River Rides in Dubuque, Iowa, and two additional passenger vessels are under construction for different owners. The Roberts vessels are the Quad City Queen and the recently delivered Mississippi Belle II.

With a length of 192.5 feet and

beam of 45 feet, the Belle II has joined the Quad City Queen (originally delivered as the Mississippi Belle and later renamed) and a third boat, the Spirit of Dubuque, in daily excursion trips in the Davenport and Dubuque areas. Robert Kehl, a restaurateur/catering service operator, is the owner of all three boats.

Of the Belle's four decks, the first and second are each outfitted with a dance floor, bandstand, and two bars. These two decks combined can

seat up to 750 persons for dinner cruises. Five crew cabins each containing two bunks, head, and shower are located on the third deck, along with a gift shop and bar. The fourth deck is an open lounging area with 200 chairs. A service elevator operates between the below-deck cooler room and the third deck.

Following construction of the Quad City Queen, some major changes were made in the design of the Belle II. Among them were an extensive hull redesign for increased speed, incorporating a model bow configuration and tunnels for the vessel's triple screws. Both the Belle and the Queen have cosmetic paddlewheels at the stern, but the boats are propeller-driven. The Belle's propellers are driven via Twin Disc MG518 reduction gears by three Cummins KTA19-M diesel engines, each rated 500 bhp at 1,800 rpm. Electrical power is provided by the two 250-kw generators driven by Cummins NT855 diesels. All the engines were supplied by Cummins Alabama, Inc. of Birmingham. The 64- by 62-inch, four-bladed propellers were supplied by Columbian Bronze Corporation; that company also assisted with the tunnel design.

The Belle II is equipped with Furuno radar and Raytheon Fa-

### MISSISSIPPI BELLE II Equipment List

Main Engines (3)	Cummins
Reduction Gears	Twin Disc
Generators (2)	Cummins
Propellers	Columbia Bronze
Radar	Furuno
Fathometer	Raytheon
Life jackets	Atlantic & Pacific

thometer. There are 1,000 Atlantic and Pacific life jackets on board for passengers and the crew of 40. The vessel is capable of speeds up to 12 knots on her day-long, 100-mile cruises between Dubuque and Bettendorf, as well as round trips to McGregor, Iowa.

For full information on Patti Shipyard's facilities and capabilities,

Circle 23 on Reader Service Card

## World International Reports Sharply Increased Profits

World International (Holdings) Ltd. of Hong Kong, the principal shipping entity of Sir Y.K. Pao, has announced a dramatic increase in after-tax profits for the fiscal year ended March 31 of HK\$320 million (about \$41 million). This is a rise of 48 percent over the previous year's profits.

Maritime Reporter/Engineering News

# 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.

## AIR COMPRESSORS

Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND  
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928  
Squire-Cogswell Company, 3411 Commercial Ave., Northbrook, IL 60062

## AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION

Bailey Refrigeration Co., Inc., 2323 Randolph Avenue, Avenel, NJ 07001  
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 Norrköping, Sweden  
United Technologies, Carrier Transicold Division, P.O. Box 4805, Syracuse NY 13221  
York International Corp., P.O. Box 1592-361C, York, PA 17405

## ALARM SYSTEMS

Siemens Energy And Automation Inc., 635 Montrose Ave., So. Plainfield, NJ 07080

## ANCHORS AND CHAIN

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

## ANODES—Cathodic Protection

Engelhard Industries Division, 2655 U.S. Route 22, Union, NJ 07083  
Federal Harco, P.O. Box 40310, Houston, TX 77240  
Kaiser Chemicals, 7311 E. 41st St., Tulsa OK 74147  
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

## AUTOMATION SYSTEMS

Siemens Energy And Automation Inc., 635 Montrose Ave., So. Plainfield, NJ 07080

## BALLASTS

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

## BASKET STRAINERS

Riley-Beard, P.O. Box 31115, Shreveport, LA 71130

## BEARINGS—Rubber, Metallic, Non-Metallic

Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn NY 11231  
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062  
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, OH 44309  
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470  
Thomson-Gordon Limited, 3225 Mainway, Burlington, Ontario, Canada L7M 1A6  
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186

## BOILERS

Aalborg Vaerft, P.O. Box 661, DK-9100 Aalborg DENMARK  
Combustion Engineering, Inc., Windsor, CT 06095  
Industrial Engineering & Equipment Co., 425 Hanley Industrial Ct., St. Louis, MO 63144  
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928

## BOILER CLEANING

Asea Stal, 50 Chestnut Ridge Rd., Montvail N.J. 07645  
Infrasonik AB (an ASEA Stal Co.), S-612 20 Finspong, SWEDEN

## BROKERS

Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, LA 70153  
Bergeron & Associates, P.O. Box 726, Chalmette LA 70044  
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401  
Jack Faulkner Inc., 2419 Caddy Lane, P.O. Box 371, Flossmoor IL 60422  
Mowbray's Tug & Barge Sales Corp., 21 West St., New York, NY 10006  
Western Maritime, 701 B Street, San Diego, CA 92101

## BRONZES—COMMEMORATIVE

Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

## BUNKERING SERVICE

Belcher Company Inc., 8700 West Flagler, P.O. Box 025500, Miami FL 33152  
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022  
National Marine Service Inc. (Transport Div.), 1750 Brentwood Blvd., St. Louis, MO 63144  
Tramp Oil & Marine Ltd., London ENGLAND. Telex: 8812194

## CARGO ACCESS EQUIPMENT

Hiab Cranes & Loaders, Inc., 258 Quigley Blvd., New Castle, DE 19720  
MacGregor-Navire International A.B., P.O. Box 4111, S-400 40 Gothenburg SWEDEN  
MacGregor Navire (U.S.A.) Inc., 135 Dermody St., Cranford, NJ 07016

## CASTINGS/FORGINGS

NKS Industria Pesada, Grupo Industrial, Reforma 404, 140 Piso, Mexico, D.F. 06600 U.S. REP.—Lexington International Trading, Inc., 551 Fifth Ave., Room 910, New York N.Y. 10017

## CHOCKING COMPOUND

InterProducts, Inc., 129 King Road E, Nobleton, Ontario LOG INO Canada  
InterProducts, Inc., Avon Street Business Center, P.O. Box 1848, Charlottesville, VA 22903

Philadelphia Resins Corp., 20 Commerce St., Montgomeryville, PA 18936  
Wirelock, 129 King Road E, Nobleton, Ontario LOG INO Canada

## CLAMPS

Inter Product, Inc., Avon Street Business Center, P.O. Box 1848, Charlottesville, VA 22903

## CLOSURES—Marine

Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

## COMPUTERIZED INFORMATION SYSTEMS

Fisher Scientific, 711 Forbes Ave., Pittsburgh PA 15219  
TIMSCO, 622 Azalea Rd., Mobile, AL 36609  
Veson Systems, 29 Broadway, Suite 1002, New York, NY 10006

## CONDENSERS/SEPARATORS

Riley-Beard, P.O. Box 31115, Shreveport, LA 71130  
Wright Austin Co., 3245 Wight St., Detroit MI 48207

## CONTROL SYSTEMS—Monitoring

American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906  
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  
Instruments Computers & Controls Corp., 6942 Haven Creek Dr., Katy TX 77449  
Leslie Co., 401 Jefferson Rd., Parsippany, NJ 07054  
Pandel Instruments Inc., 2100 N. Hwy. 360, Grand Prairie, TX 75050  
Propulsion Systems, Inc., 21213 76 Ave., Kent, WA 98032

Siemens Energy And Automation Inc., 635 Montrose Ave., So. Plainfield, NJ 07080

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

## CRANES—HOISTS—DERRICKS—WHIRLEYS

The Crosby Group, Inc., P.O. Box 3128, Tulsa OK 74101  
Davit Sales, Inc., P.O. Box 232, Jefferson Valley, NY 10535  
Hiab Cranes & Loaders, Inc., 258 Quigley Blvd., New Castle, DE 19720  
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235  
J.D. Neuhaus, Hebezeuge, D5810, Witten Heven, West Germany  
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030  
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202

Manitex, Inc., 2203 Timberlock Place, Suite 130, The Woodlands, TX 77380

## DECK MACHINERY—Cargo Handling Equipment

Markey Machinery Co., Inc., 79 S. Horton St., Seattle, WA 98134  
McElroy Machine & Mfg. Co., Inc., Lorraine Rd., Industrial Seaway, Gulfport, MS 39501

## DECKING—GRATING

Aligned Fiber Composites, Highway 52, South Chatfield, MN 55923  
International Grating, 7625 Parkhurst, Houston, TX 77028

## DIESEL ACCESSORIES—CYLINDER 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  
Illman Jones Inc., 5505 Broadway, 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, Inc., Engine Division, 100 NE 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  
Granges Repair Service GMBH, Gutenbergring, 64 D-2000 Hamburg-Norderstedt TX:0215553

Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, Federal Republic of Germany

Schoonmaker Service Parts Co., Inc., P.O. Box 757, Foot of Spring St., Sausalito, CA 94966

Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637

Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166  
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647

## ELECTRICAL EQUIPMENT

Eldec Corporation, 16700 13th Ave West, P.O. Box 100, Lynwood WA 98036  
Lima Electric Co., P.O. Box 918, Lima OH 45802  
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 INFORMATION SYSTEMS

Inventory Locator Service Inc., 3820 Premier Ave., Memphis TN 38118

## ELECTRONIC SYSTEMS

Marine Electric RPD, Inc., 666 Pacific St., Brooklyn, NY 11217 TX: 125327  
Marine Safe Electronics Ltd., 37 Staffen Drive, Concord (Toronto), Ontario CANADA L4K 2X2

## 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 Company, 233 E. Redwood 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  
Hosfeld 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

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

Transamerica Delaval Inc., Corporate Marine Program, Cowles Rd., Plainville CT 06062

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, Baltorpevej 154, KD-2750 Bllerrup, Copenhagen DENMARK

Equipment Engineering, 666 Baker St., No. 265, Costa Mesa CA 92626  
Meco (Mechanical Equipment Co., Inc.), 861 Carondelet Street, New Orleans, LA 70130

Riley-Beard, 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

Robinson Industries, P.O. Box 100, Zelenople, PA 16063

## FASTENERS

Action Threaded Products Inc., 7440 W. 100th Place, Bridgeview IL 60455  
Erico Fastening Systems, Inc., 301 New Albany Rd, Moorestown, NJ 08057  
Troy Company, 315 Fairfield Rd, Fairfield, NJ 07006

## FENDERING SYSTEMS—Dock & Vessel

Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062

Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241  
Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook VA 22624

## FILTERS

Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307  
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928

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 ADDITIVE

Drew Amerid Marine, One Drew Chemical Plaza, Boonton NJ 07005

## FUEL OIL/LUBE OIL—Analysis & Testing

Ferrous Corporation, 910-108th N.E., P.O. Box 1764, Bellevue, WA 98009  
Ocean Fleet Services, 1301 Metropolitan Ave., Thorofare, NJ 08086

## FURNITURE

Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001

Comfort-Mate, Inc., 7988 NW 56th Street, Miami, FL 33166

## GALLEY EQUIPMENT

Greitzer, Inc., 101 Riverdale Rd., Riverdale NJ 07457  
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 International, A.B., P.O. Box 4111, S-400 40 Gothenburg 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-Beard, P.O. Box 31115, Shreveport, LA 71130  
Vapor Corp., 6420 West Howard St., Chicago IL 60648

## HORNS/WHISTLES

Kahlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241

## HULL CLEANING

Petroferm Marine, Route 2, Box 280, Amelia Island, FL 32034  
Phosmarine Equipment, 21 Bd. de Paris, 13002, Marseille, France

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 Gaudio 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 Associates Inc., 510 Bering Dr., Houston TX 77057

## 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

Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

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 5320

American Hydromath Inc., Box 2450, Danby-Pawlet Road, Powlet, VT 05761  
 American Systems Engineering Corp., P.O. Box 8988, Virginia Beach, VA 23452  
 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 Westbrook Mall, Vancouver, B.C. Canada V6S 2L2  
 Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130  
 CDI Marine Co., 900 Regency Square Blvd., Suite 203, 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 Glaston 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  
 J.H. Inc. of Virginia, 330 County St., Portsmouth VA 23704  
 R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073  
 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 Turquoise St., Ste 217, San Diego, CA 92109  
 Maritime Design, Inc., 2955 Hartley Rd., Jacksonville, FL 32217  
 R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003  
 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 International Engineering Corporation, 3019 Mercedes Blvd., New Orleans, LA 70114  
 Omega Marine Engineering Systems Inc., 11757 Katy Freeway, Suite 390, Houston TX 77079  
 Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, FL 33156  
 Q.E.D. Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455  
 M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St., San Francisco, CA 94105  
 Sargent & Herkes Inc., 611 Gravier St., New Orleans, LA 70130  
 Schmah and Schmah, Inc., 1209 S.E. Third Ave., Fort Lauderdale, FL 33316  
 SEACOR Systems Engineering Corp., 520 Fellowship Rd., Ste C306, Mt. Laurel NJ 08054  
 STV/Sanders & 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 Amberlton Drive, Baltimore, MD 21227  
 Timsco, 622 Azalea Road, Mobile, AL 36609  
 Tracor Hydraulics, Inc., 7210 Pindell School Rd., Laurel, MD 20707  
 Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744

**NAVIGATION & COMMUNICATIONS EQUIPMENT**  
 AT&T Communications, 412 Mt Kemble Ave., Room N420, Morristown, NJ 07960  
 Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080  
 Comsat Maritime Services, 22250 Comsat Dr., Clarksburg MD 20871  
 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 Vopfabrik, Norcontrol Division, P.O. Box 145, Horten 3191, Norway  
 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  
 Rocal 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  
 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  
 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  
 Equipment Engineering, 666 Baker St., No. 265, Costa Mesa CA 92626  
 FAST Systems, Inc., 1717 Sublette, St. Louis, MO 63110  
 Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND  
 Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928  
 Mitsubishi International Corp., Machinery Div., 520 Madison Ave., New York, NY 10022  
 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  
 Devco Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207  
 Esgard, Box 2698, Lafayette, LA 70502  
 Hempel Marine Paints, Inc., Foot of Currie Ave., Wallington, NJ 07057; 6868 North Loop East, Suite 304, Houston, TX 77028; P.O. Box 10265, New Orleans, LA 70181  
 International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083  
 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

**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  
 Hydro-Craft Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063  
 Knights Piping Inc., 5309 Industrial Road, Pascagoula, MS 39567  
 Murdock Engineering, P.O. Box 152278, Irving, TX 75015  
 Tioga Pipe Supply Co. Inc., 2450 Whestsheaf 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

**PNEUMATICS**  
 Limitorque Corporation, 5114 Woodall Rd., Lynchburg, VA 24506

**PROPELLER POLISHING**  
 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  
 Armc 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, Inc. Engine Division, 100 NE Adams St., Lawton IL 61629  
 Colt Industries Inc. (Fairbanks Morse Engine Div.), 701 Lewiston Avenue, Beloit, WI 53511  
 Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520  
 Combustion Engineering, Inc., Windsor, CT 06095  
 Coolidge Propeller, 1608 Fairview Ave. East, Seattle, WA 98102; 3717 Industrial Rd., Pascagoula, MS 39567  
 Coolidge-Stone Vickers, Inc., 56 Squirrel Rd., Auburn Hills, MI 48057  
 Daihatsu Diesel (USA) Inc., 180 Adams Ave., Happaugue NY 11788  
 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  
 Golden Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231  
 KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada  
 Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241  
 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 Parsippany Road, Parsippany, NJ 07054  
 Inland Water Propulsion Systems, Inc., 580 Walnut St., Cincinnati, OH 45201  
 Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032  
 Riva Calzoni, Via Stendhal 34, 20144 Milan ITALY  
 SKF Steel, Couplings Div., 22 Waterville Rd., P.O. Box 745, Avon, CT 06001  
 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  
 Tenfjord Inc., 200 Jackson Ave., Hoboken, NJ 07030  
 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 NJ. 07030  
 Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224  
 Del Gaudio, 207 W. Central Ave., Maywood, NJ 07067. Telex: 132611 DEL-MARINE  
 FMC Coffin Turbo Pump, 326 S Dean St., Englewood NJ 07631  
 Goltsens, 160 Von Brunt St., Brooklyn, NY 11231

Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND  
 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 Transcold 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. Industriepark 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, IL 61111  
 FAST Systems Inc., 1717 Sublette, St. Louis, MO 63110  
 Golar Metal A/S, P.O. Box 70, 4901 Tvedestrand, Norway  
 Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND

**SCAFFOLDING EQUIPMENT—Work Platforms**  
 McCausey Lumber Co., 7751 Lyndon, Detroit, MI 48238

**SCALE MODELS**  
 Oriental Industry Co., 408-29 Sokyo-Dong, Mapo-ku Seoul KOREA

**SCUTTLES/MANHOLES**  
 Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

**SHAFT SEALS, MECHANICAL PACKING**  
 EG&G Seal 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 Hydraulics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA 93116  
 M.A.N.—GHH, Sterkrade Werksrabe 112 D-4100 Duisburg 18, West Germany  
 MAN—GHH, P.O. Box 110240, D-4200 Oberhausen 11, 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**  
 Armc Steel Corp., 703 Curtis St., Middletown, OH 45042  
 Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018  
 Welded Beam Company, P.O. Box 280, Perry, OH 44081

**SHIPBUILDING—Repairs, Maintenance, Drydocking**  
 Arsenalo Triestino-San Marco Shipyard, Trieste, Italy, U.S. Rep: Marine Technologies & Brokerage, 33 Rector St., New York, NY 10066  
 Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150  
 Bardex Hydraulics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA 93116  
 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  
 Brodrosplit, Put Udarniku 19, P.O. Box 107, 58000 Split YUGOSLAVIA  
 Burrard Yarrrows Corporation, P.O. Box 86099, North Vancouver, B.C., Canada  
 Chesapeake Shipbuilding Inc., 710 Fitzwater St., Salisbury, MD 21801  
 Cityvarvet AB, Lindholmen, P.O. Box 2753, S-402 76 Goteborg SWEDEN  
 Conrad Industries, P.O. Box 790, Morgan City, LA 70380  
 Coast Iron & Machine Works, 5225-7th Street E., Tacoma, WA 98424  
 Curacao Drydock (U.S.A.) Inc., 26 Broadway, Suite 741, New York, NY 10004  
 Eastern Marine, Inc., P.O. Box 1009, Panama City, FL 32401  
 Enterprise Marine & Industrial Repairs Inc., Tyler & Coastwise Streets, Port Newark, NJ 07114  
 Fincantieri SpA Cantieri Navali Italiani, Via Cipro 11, 16129 Genoa ITALY  
 Gladding-Hearn Shipbuilding, Box D (1 Riverside Ave.), Somerset MA 02726  
 Good People Sea And Shore Services Inc., 255 Commercial St., North Sydney, Cape Breton Island, NS CANADA B2A 3M3  
 HBC Barge Co. Brownsville, PA 15417  
 Hitachi Zosen Corp., 1-1-1 Hitotsubashi, Chiyoda-ku, Tokyo 100, Japan  
 Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong  
 Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, KOREA  
 Industrial Marine Engineering Ltd., P.O. Box 172, Suva, Fiji  
 Jeffboat Inc., Jeffersonville, Ind. 47130  
 Jered Brown Brothers, Inc., 56 S. Squirrel Rd., Auburn Hills, MI 48057  
 Keppel Shipyard Limited, 325 Telok Blangah Road, P.O. Box 2169, Singapore 0409  
 Koch Ellis Barge & Ship Service, P.O. Box 9130, Westwego, LA 70094  
 Paul Lindenau GmbH, & Co., Schiffswerft u. Maschinenfabrik, D-2300 Kiel-Friedrichsort, West Germany  
 Lisnave, Apartado 2138, 1103 Lisbon, Codex PORTUGAL  
 Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, WA 98134  
 M.A.N. GHH Sterkrade, P.O.B. 110240, D-4200 Oberhausen 11, West Germany  
 Main Iron Works, Inc., P.O. box 1918, Houma, LA 70361  
 Marathon LeTourneau Offshore, P.O. Box 61865, Houston, TX 77208  
 Marco, Inc., 2300 W Commodore Way, Seattle, WA 98199  
 Marinette Maine Corporation, Marinette, WI 54143  
 Mitsubishi Heavy Industries, Ltd., 5-1, Marunochi 2-chome, Chiyoda-ku, Tokyo, 100 Japan  
 MonArk Boat Co., P.O. Box 210, Monticello, AR 71655  
 Moran Shipping Agencies, 602 Sawyer, Suite 200, Houston, TX 77077  
 Moss Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552  
 National Marine Service (Shipyard Division), P.O. Box 38, Hartford, IL 62048  
 National Steel & Shipbuilding Corp., San Diego, CA 92112  
 Nautilus Surveys Inc., 10822 Sageleaf Lane, Houston, TX 77089  
 Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607  
 Nichols Brothers Boat Builders Inc., P.O. Box 580, 5400 S. Cameron Rd., Freeland, WA 98249  
 Northwest Marine Ironworks, P.O. Box 3109, Portland, OR 97208  
 Pennsylvania Shipbuilding, P.O. Box 442, Chester, PA 19016

ADVERTISE IN THESE

# 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.

## AIR COMPRESSORS

Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND  
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928  
Squire-Cogswell Company, 3411 Commercial Ave., Northbrook, IL 60062

## AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION

Bailey Refrigeration Co., Inc., 2323 Randolph Avenue, Avenel, NJ 07001  
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  
York International Corp., P.O. Box 1592-361C, York, PA 17405

## ALARM SYSTEMS

Siemens Energy And Automation Inc., 635 Montrose Ave., So. Plainfield, NJ 07080

## ANCHORS AND CHAIN

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

## ANODES—Cathodic Protection

Engelhard Industries Division, 2655 U.S. Route 22, Union, NJ 07083  
Federal Harco, P.O. Box 40310, Houston, TX 77240  
Kaiser Chemicals, 7311 E. 41st St., Tulsa OK 74147  
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

## AUTOMATION SYSTEMS

Siemens Energy And Automation Inc., 635 Montrose Ave., So. Plainfield, NJ 07080

## BALLASTS

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

## BASKET STRAINERS

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

## BEARINGS—Rubber, Metallic, Non-Metallic

Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn NY 11231  
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062  
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, OH 44309  
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470  
Thomson-Gordon Limited, 3225 Mainway, Burlington, Ontario, Canada L7M 1A6  
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186

## BOILERS

Aalborg Vaerft, P.O. Box 661, DK-9100 Aalborg DENMARK  
Combustion Engineering, Inc., Windsor, CT 06095  
Industrial Engineering & Equipment Co., 425 Hanley Industrial Ct., St. Louis, MO 63144

Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928

## BOILER CLEANING

Asea Stal, 50 Chestnut Ridge Rd., Montvail N.J. 07645  
Infrasonik AB (an ASEA Stal Co.), S-612 20 Finspong, SWEDEN

## BROKERS

Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, LA 70153  
Bergeron & Associates, P.O. Box 726, Chalmette LA 70044  
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401  
Jack Faulkner Inc., 2419 Caddy Lane, P.O. Box 371, Flossmoor IL 60422  
Mowbray's Tug & Barge Sales Corp., 21 West St., New York, NY 10006  
Western Maritime, 701 B Street, San Diego, CA 92101

## BRONZES—COMMEMORATIVE

Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

## BUNKERING SERVICE

Belcher Company Inc., 8700 West Flagler, P.O. Box 025500, Miami FL 33152  
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022  
National Marine Service Inc. (Transport Div.), 1750 Brentwood Blvd., St. Louis, MO 63144

Tramp Oil & Marine Ltd., London ENGLAND. Telex: 8812194

## CARGO ACCESS EQUIPMENT

Hiab Cranes & Loaders, Inc., 258 Quigley Blvd., New Castle, DE 19720  
MacGregor-Navire International A.B., P.O. Box 4111, S-400 40 Gothenburg SWEDEN

MacGregor Navire (U.S.A.) Inc., 135 Dermody St., Cranford, NJ 07016

## CASTINGS/FORGINGS

NKS Industria Pesada, Grupo Industrial, Reforma 404, 140 Piso, Mexico, D.F. 06600 U.S. REP.—Lexington International Trading, Inc., 551 Fifth Ave., Room 910, New York N.Y. 10017

## CHOCKING COMPOUND

InterProducts, Inc., 129 King Road E, Nobleton, Ontario LOG INO Canada  
InterProducts, Inc., Avon Street Business Center, P.O. Box 1848, Charlottesville, VA 22903

Philadelphia Resins Corp., 20 Commerce St., Montgomeryville, PA 18936

Wirelock, 129 King Road E, Nobleton, Ontario LOG INO Canada

## CLAMPS

Inter Product, Inc., Avon Street Business Center, P.O. Box 1848, Charlottesville, VA 22903

## CLOSURES—Marine

Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

## COMPUTERIZED INFORMATION SYSTEMS

Fisher Scientific, 711 Forbes Ave., Pittsburgh PA 15219  
TIMSCO, 622 Azalea Rd., Mobile, AL 36609  
Veson Systems, 29 Broadway, Suite 1002, New York, NY 10006

## CONDENSERS/SEPARATORS

Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130  
Wright Austin Co., 3245 Wight St., Detroit MI 48207

## CONTROL SYSTEMS—Monitoring

American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906  
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  
Instruments Computers & Controls Corp., 6942 Haven Creek Dr., Katy TX 77449

Leslie Co., 401 Jefferson Rd., Parsippany, NJ 07054

Pandel Instruments Inc., 2100 N. Hwy. 360, Grand Prairie, TX 75050

Propulsion Systems, Inc., 21213 76 Ave., Kent, WA 98032

Siemens Energy And Automation Inc., 635 Montrose Ave., So. Plainfield, NJ 07080

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

## CRANES—HOISTS—DERRICKS—WHIRLIES

The Crosby Group, Inc., P.O. Box 3128, Tulsa OK 74101  
Davit Sales, Inc., P.O. Box 232, Jefferson Valley, NY 10535  
Hiab Cranes & Loaders, Inc., 258 Quigley Blvd., New Castle, DE 19720  
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235  
J.D. Neuhaus, Hebezeuge, D5810, Witten Heven, West Germany  
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030  
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202

Manitex, Inc., 2203 Timberlock Place, Suite 130, The Woodlands, TX 77380

## DECK MACHINERY—Cargo Handling Equipment

Markey Machinery Co., Inc., 79 S. Horton St., Seattle, WA 98134  
McElroy Machine & Mfg. Co., Inc., Lorraine Rd., Industrial Seaway, Gulfport, MS 39501

## DECKING—GRATING

Aligned Fiber Composites, Highway 52, South Chatfield, MN 55923  
International Grating, 7625 Parkhurst, Houston, TX 77028

## DIESEL ACCESSORIES—CYLINDER 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

Illman Jones Inc., 5505 Broadway, 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  
BMW Bergen Diesel A.S., P.O. Box 924, N-5001 Bergen NORWAY; 2110-10 Service Rd., Kenner LA 70062  
Caterpillar, Inc., Engine Division, 100 NE 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  
Granges Repair Service GmbH, Gutenbergring, 64 D-2000 Hamburg-Norderstedt TX:0215553  
Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, Federal Republic of Germany

Schoonmaker Service Parts Co., Inc., P.O. Box 757, Foot of Spring St., Sausalito, CA 94966

Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637

Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166

Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647

## ELECTRICAL EQUIPMENT

Eldec Corporation, 16700 13th Ave West, P.O. Box 100, Lynwood WA 98036

Lima Electric Co., P.O. Box 918, Lima OH 45802

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 INFORMATION SYSTEMS

Inventory Locator Service Inc., 3820 Premier Ave., Memphis TN 38118

## ELECTRONIC SYSTEMS

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

Marine Safe Electronics Ltd., 37 Staffen Drive, Concord (Toronto), Ontario CANADA L4K 2X2

## 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 Company, 233 E. Redwood 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

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

Transamerica Delaval Inc., Corporate Marine Program, Cowles Rd., Plainville CT 06062

Waterman Supply Co., Inc., 2815 E. Anaheim Street, P.O. Box 596, Wilmington, CA 90748

## EVAPORATORS

Alfa-Laval, Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024

Atlas-Danmark Marine & Offshore, Baltorpvej 154, KD-2750 Bllerup, Copenhagen DENMARK

Equipment Engineering, 666 Baker St., No. 265, Costa Mesa CA 92626

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

Robinson Industries, P.O. Box 100, Zelenople, PA 16063

## FASTENERS

Action Threaded Products Inc., 7440 W. 100th Place, Bridgeview IL 60455

Erico Fastening Systems, Inc., 301 New Albany Rd, Moorestown, NJ 08057

Troy Company, 315 Fairfield Rd, Fairfield, NJ 07006

## FENDERING SYSTEMS—Dock & Vessel

Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062

Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook VA 22624

## FILTERS

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

Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928

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 ADDITIVE

Drew Ameroid Marine, One Drew Chemical Plaza, Boonton NJ 07005

## FUEL OIL/LUBE OIL—Analysis & Testing

Ferrous Corporation, 910-108th N.E., P.O. Box 1764, Bellevue, WA 98009

Ocean Fleet Services, 1301 Metropolitan Ave., Thorofare, NJ 08086

## FURNITURE

Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001

Comfort-Mate, Inc., 7988 NW 56th Street, Miami, FL 33166

## GALLEY EQUIPMENT

Greitzer, Inc., 101 Riverdale Rd., Riverdale NJ 07457

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 International, A.B., P.O. Box 4111, S-400 40 Gothenburg 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

## HORNS/WHISTLES

Kohlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241

## HULL CLEANING

Petroferm Marine, Route 2, Box 280, Amelia Island, FL 32034

Phosmarine Equipment, 21 Bd. de Paris, 13002, Marseille, France

Taylor Diving & Salvage Co. Inc., 701 Engineers Rd., Belle Chasse, LA 70037

## HYDRAULICS

Aeroquip Corp., 1130 Maynard Road, Jackson, MI 49202

Bardex Hydraulics, 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 07067

Hydra-Dynamics, Inc., 2141 Greenwood Ave., Wilmette, IL 60091

Parker Hannifin Corporation, 17325 Euclid Avenue, Cleveland, OH 44112

Titelux 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 Associates Inc., 510 Bering Dr., Houston TX 77057

## 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

American Hydromath Inc., Box 2450, Danby-Pawlet Road, Pawlet, VT 05761

American Systems Engineering Corp., P.O. Box 8988, Virginia Beach, VA 23452

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 Westbrook Mall, Vancouver, B.C. Canada V6S 2L2

Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130

CDI Marine Co., 900 Regency Square Blvd., Suite 203, 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 Sinksink 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

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 Turquoise St., Ste 217, San Diego, CA 92109

Maritime Design, Inc., 2955 Hartley Rd., Jacksonville, FL 32217

R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003

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 International Engineering Corporation, 3019 Mercedes Blvd., New Orleans, LA 70114

Omega Marine Engineering Systems Inc., 11757 Katy Freeway, Suite 390, Houston TX 77079

Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, FL 33156

Q.E.D. Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455

M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St., San Francisco, CA 94105

Sargent & Herkes Inc., 611 Gravier St., New Orleans, LA 70130

Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, FL 33316

SEACOR Systems Engineering Corp., 520 Fellowship Rd., Ste C306, Mt. Laurel NJ 08054

STV/Sanders & 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

Timcos, 622 Azalea Road, Mobile, AL 36609

Tracor Hydraulics, Inc., 7210 Pindell School Rd., Laurel, MD 20707

Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744

**NAVIGATION & COMMUNICATIONS EQUIPMENT**

AT&T Communications, 412 Mt Kemble Ave., Room N420, Morristown, NJ 07960

Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080

Comsat Maritime Services, 22250 Comsat Dr., Clarksburg MD 20871

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 Vopenfabrik, Norcontrol Division, P.O. Box 145, Horten 3191, Norway

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

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

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

Equipment Engineering, 666 Baker St., No. 265, Costa Mesa CA 92626

FAST Systems, Inc., 1717 Sublette, St. Louis, MO 63110

Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND

Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928

Mitsubishi International Corp., Machinery Div., 520 Madison Ave., New York, NY 10022

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

Devco Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207

Esgard, Box 2698, Lafayette, LA 70502

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

Jatun 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

**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

Hydro-Craft Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063

Knights Piping Inc., 5309 Industrial Road, Pasagoula, MS 39567

Murdoch Engineering, P.O. Box 152278, Irving, TX 75015

Tioga Pipe Supply Co. Inc., 2450 Wheatshaf 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

**PNEUMATICS**

Limiterque Corporation, 5114 Woodall Rd., Lynchburg, VA 24506

**PROPELLER POLISHING**

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

Armo 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, Inc., Engine Division, 100 NE 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 Propeller, 1608 Fairview Ave. East, Seattle, WA 98102; 3717 Industrial Rd., Pasagoula, MS 39567

Coolidge-Stone Vickers, Inc., 56 Squirrel Rd., Auburn Hills, MI 48057

Daihatsu Diesel (USA) Inc., 180 Adams Ave., Happaage NY 11788

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

Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323

M.A.N.—B&W Diesel, 2 Ostervej, DK-4960 Høleby, 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 Parsippany Road, Parsippany, NJ 07054

Inland Water Propulsion Systems, Inc., 580 Walnut St., Cincinnati, OH 45201

Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032

Riva Calzoni, Via Stendhal 34, 20144 Milan ITALY

SKF Steel, Couplings Div., 22 Waterville Rd., P.O. Box 745, Avon, CT 06001

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

Tenford Inc., 200 Jackson Ave., Hoboken, NJ 07030

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 Gaudio, 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

Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND

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. Industriepark 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, IL 61111

FAST Systems Inc., 1717 Sublette, St. Louis, MO 63110

Golar Metal A/S, P.O. Box 70, 4901 Tvedestrand, Norway

Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND

**SCAFFOLDING EQUIPMENT—Work Platforms**

McCausey Lumber Co., 7751 Lyndon, Detroit, MI 48238

**SCALE MODELS**

Oriental Industry Co., 408-29 Sokyo-Dong, Mapo-ku Seoul KOREA

**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 Packaging 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 Hydraulics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA 93116

M.A.N.—GHH, Sterkrade Werksrabe 112 D-4100 Duisburg 18, West Germany

MAN—GHH, P.O. Box 110240, D-4200 Oberhausen 11, 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

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

Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150

Bardex Hydraulics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA 93116

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

Brodsploit, Put Udarniku 19, P.O. Box 107, 58000 Split YUGOSLAVIA

Burrard Yarrow's Corporation, P.O. Box 86099, North Vancouver, B.C., Canada

Chesapeake Shipbuilding Inc., 710 Fitzwater St., Salisbury, MD 21801

Cityvarvet AB, Lindhalmen, P.O. Box 2753, S-402 76 Goteborg SWEDEN

Conrad Industries, P.O. Box 790, Morgan City, LA 70380

Coast Iron & Machine Works, 5225-7th Street E., Tacoma, WA 98424

Curacao Drydock (U.S.A.) Inc., 26 Broadway, Suite 741, New York, NY 10004

Eastern Marine, Inc., P.O. Box 1009, Panama City, FL 32401

Enterprise Marine & Industrial Repairs Inc., Tyler & Coastwise Streets, Port Newark, NJ 07114

Fincantieri SpA Cantieri Navali Italiani, Via Cipro 11, 16129 Genoa ITALY

Gladfinger-Hearn Shipbuilding, Box D (I Riverside Ave.), Somerset MA 02726

Good People Sea And Shore Services Inc., 255 Commercial St., North Sydney, Cape Breton Island, NS CANADA B2A 3M3

HBC Barge Co. Brownsville, PA 15417

Hitachi Zosen Corp., 1-1-1 Hitotsubashi, Chiyoda-ku, Tokyo 100, Japan

Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong

Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, KOREA

Industrial Marine Engineering Ltd., P.O. Box 172, Suva, Fiji

Jeffboat Inc., Jeffersonville, Ind. 47130

Jered Brown Brothers, Inc., 56 S. Squirrel Rd., Auburn Hills, MI 48057

Keppel Shipyard Limited, 325 Telok Blangah Road, P.O. Box 2169, Singapore 0409

Koch Ellis Barge & Ship Service, P.O. Box 9130, Westwego, LA 70094

Paul Lindenau GmbH, & Co., Schiffswerft u. Maschinenfabrik, D-2300 Kiel-Friedrichsort, West Germany

Lisnave, Apartado 2138, 1103 Lisbon, Codex PORTUGAL

Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, WA 98134

M.A.N.—GHH Sterkrade, P.O.B. 110240, D-4200 Oberhausen 11, West Germany

Main Iron Works, Inc., P.O. box 1918, Houma, LA 70361

Marathon LeTourneau Offshore, P.O. Box 61865, Houston, TX 77208

Marco, Inc., 2300 W Commodore Way, Seattle, WA 98199

Marinette Maine Corporation, Marinette, WI 54143

Mitsubishi Heavy Industries, Ltd., 5-1, Marunochi 2-chome, Chiyoda-ku, Tokyo, 100 Japan

MonArk Boat Co., P.O. Box 210, Monticello, AR 71655

Moran Shipping Agencies, 602 Sawyer, Suite 200, Houston, TX 77077

Moss Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552

National Marine Service (Shipyard Division), P.O. Box 38, Hartford, IL 62048

National Steel & Shipbuilding Corp., San Diego, CA 92112

Nautilus Surveys Inc., 10822 Sageleaf Lane, Houston, TX 77089

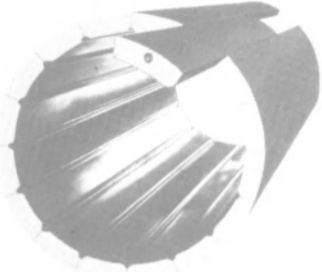
Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607

Nichols Brothers Boat Builders Inc., P.O. Box 580, 5400 S. Cameron Rd., Freeland, WA 98249

Northwest Marine Ironworks, P.O. Box 3109, Portland, OR 97208

Pennsylvania Shipbuilding, P.O. Box 442, Chester, PA 19016

## No Need To Remove Shaft For Bearing Change With Duramax Demountable Bearings



Easily replaceable, demountable rubber stave bearings are now available from the Duramax Marine Division of The Johnson Rubber Company.

The individual staves of Duramax demountable bearings can be assembled or replaced without shaft withdrawal. These keystone-sided, molded rubber staves slide into place without hindrance and can be removed as easily. Shipbuilders and owners will benefit from this time saving feature since Duramax demountable bearings can cut the cost of bearing inspection and replacement by about one-half.

Other bearings Duramax offers include metal backed stave bearings, with individually replaceable staves to support extreme shaft loads, and Duramax sleeve and flanged bearings, which feature specially formulated nitrile rubber securely bonded to metallic or nonmetallic shells.

For further information containing full information,

Circle 69 on Reader Service Card

## Greater New Orleans Barge Fleeting Association Seminar Set For October 2, 3, And 4

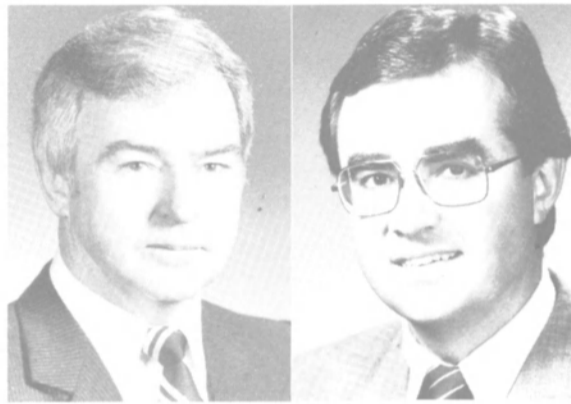
The Greater New Orleans Barge Fleeting Association has announced that it will hold a two and one-half day 1986 River Industry Seminar on Thursday, Friday and Saturday morning,

October 2, 3, and 4, at the Hotel Intercontinental in New Orleans, La.

The seminar will feature keynote speakers discussing the marine insurance marketplace, with **Simon Burroughs** of Charles Taylor and Co. representing The London Underwriter, **Christopher Williams** of Price Forbes Ltd. representing The London Broker, **James Brower** of International Marine Underwriters representing The U.S. Underwriter, and **Jerry Yacobellis** of Fred S. James & Co. representing The U.S. Broker.

For further information, contact **Richard T. McCreary**, G N O B F A Seminar Director, P.O. Box 739, Luling, La. 70070, phone (504) 443-3271 (New Orleans, La.) or (504) 785-6248 (Luling, La.).

## Major Appointments Announced By Versatile Of Canada



Donald Challinor

David Alsop

Versatile Corporation Inc. of Vancouver, B.C., recently announced two major appointments within its marine and industrial group.

**Donald W. Challinor**, president and chief executive officer of its Canadian West Coast shipyards, Versatile Pacific Shipyards Inc., with facilities in North Vancouver and Victoria, has been named president and CEO of Versatile Davie Inc. of Lauzon, Quebec, the yard that the company acquired in 1985. He has been with Versatile Pacific (formerly Burrard Yarrow Corporation) since 1968, and has been CEO since 1982.

Appointed the new president and CEO at Versatile Pacific is **David J. Alsop**, formerly the company's senior vice president. He has been with the company since 1973, and was appointed senior VP in 1982.

Versatile Corporation's third shipyard subsidiary is Versatile Vickers Inc. of Montreal, whose president and CEO is **Stuart Reader**.

For information of Versatile's shipbuilding and repairing facilities and services,

Circle 76 on Reader Service Card

## Unaflex Introduces New Molded Expansion Joints —Literature Available



Unaflex Rubber Corporation has announced the availability of their Unasphere precision molded expansion joints. Identified as Style 800, this line is available in sizes ranging from 2 inches to 12 inches in diameter.

Molded of neoprene and nylon, these units require less force for movement than conventional joints, allowing maximum deflection, elongation and compression. They are for use in a broad range of modern high-pressure and temperature piping systems to help eliminate noise and vibration and take up pipe expansion and contraction. Each Unasphere comes with alignable floating steel flanges. Spherical design provides an inherently stronger configuration that allows pressure to exert force evenly in all directions and reduce turbulence.

Literature is available on the Unasphere line. For free copies and further information,

Circle 74 on Reader Service Card

Port Allen Marine, P.O. Box 108, Port Allen, LA 70767  
Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22  
Promet Marine Services Corp., 242 Allens Ave., Providence, RI 02905  
Samsung Shipbuilding & Heavy Industries Co., Ltd., Samsung Main Bldg. 250, 2Ka, Taepyeong-ro, Chung-ku, Seoul, Korea  
Southwest Marine, Inc., P.O. Box 13308, San Diego, CA 92113  
Sudoimport, 10 Usperski Per, 103006 Moscow USSR  
Tampa Shipyards Inc., P.O. Box 1277, Tampa, FL 33601  
3. MAJ Associated Shipbuilding Industry, P.O. Box 117, 51001 Rijeka YUGO-SLAVIA

Todd Shipyards Corporation, One Evertrust Plaza, Jersey City, NJ 07302  
Tracor Marine, P.O. Box 13107, Port Everglades, FL 33316  
Verreault Navigation Inc., Les Mechins, Quebec, G0J 1T0  
Walker Boat Yard, P.O. Box 729, Paducah, KY 42001  
Waller Marine, Inc. 11777 Katy Freeway/Suite 395, Houston, TX  
Westport Shipyard, Inc., P.O. Box 308, Westport, WA 98595  
Zidell Explorations, Inc., 3121 S.W. Moody Street, Portland, OR 97201

### SHIPPING—PACKING

Pilotage Consultants, Inc., P.O. Box 2046, New Hyde Park, NY 11040  
Signet Corporation, 1800 West Loop South, Suite 1600, Houston, TX 77027

### SIMULATOR TRAINING

Marine Safety International, Marine Air Terminal, LaGuardia Airport, NY 11371  
Ship Analytics/Maritime Training & Research Center, North Stonington Professional Center, N Stonington CT 06359

### SILENCERS

Riley-Beard, P.O. Box 31115, Shreveport, LA 71130

### STUFFING BOXES

Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062

Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

### SURVEYORS AND CONSULTANTS

Advanced Technologies Dept. PZ-01, 7926 Jones Branch Dr., McLean, VA 22102

Frank Jeffrey & Assoc., 5201 Westbank Exp., Suite 206, Marrero, LA 70073

### SURVIVAL EQUIPMENT

Harvey's Commercial Marine Division, 205 South 252 St., Kent, WA 98032  
Imperial Manufacturing Co., P.O. Box 4119, Bremerton, WA 98312  
Survival International, 7859 S 180th St., Kent, WA 98032

### TANK CLEANING

Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928  
Saab Tank Control, One Harmon Plaza, Secaucus NJ 07094

### TANK LEVELING INDICATORS

Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062  
Saab Tank Control, One Harmon Plaza, Secaucus NJ 07094  
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062

### TORSIONAL VIBRATION SPECIALISTS

T.W. Spaetgens, 156 W. 8th Ave., Vancouver, Canada, V5Y 1N2  
**TOWING—Barges, Vessel Chartering, Lighterage, Salvage, etc.**  
Bay Houston Towing Co., 2243 Milford, P.O. Box 3006, Houston, TX 77253  
Bulkfleet Marine Corporation, 1800 West Loop S., Ste 1600, Houston, TX 77027

Curtis Bay Towing, World Trade Center, Suite 800, Baltimore MD 21202  
Jack Faulkner, Inc., 1005 W. Harimaw Ct., Metairie, LA 70001  
McAllister Bros., Inc., 17 Battery Pl., New York, NY 10004  
McDonough Marine Service, P.O. Box 26206, New Orleans, LA  
Midland Affiliated Co., 580 Walnut St., Cincinnati, OH 45201  
Moron Towing & Transportation, Two Greenwich Plaza, Greenwich CT 06830  
National Marine Service, Transport Div., 1750 Brentwood Blvd., St. Louis, MO 63144

Port Allen Marine Service, Inc., P.O. Box 108, Port Allen, LA 70767; Walker Boat Yard, P.O. Box 729, Port Allen, LA  
Suderman & Young Co., Inc., 918 World Trade Bldg., Houston, TX 77002  
Turecama Coastal & Harbor Corp. 1 Edgewater Plaza Staten Island, N.Y. 10305

### VALVES AND FITTINGS

Bailey, Division of CMB Industries, P.O. Box 8070, Fresno, CA 93747  
Boston Metals Company, 233 E. Redwood St., Baltimore, MD 21202  
Cajon Co., 9760 Shepard Rd., Macedonia, OH 44056  
Cla-Val Co., P.O. Box 1325, Newport Beach, CA 92663  
Crawford Fitting Company, 29500 Solon Road, Solon, OH 44139  
Elliott Manufacturing Co., Inc. (Remote Valve Operating Equipment), P.O. Box 773, Binghamton, NY 13902  
Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07207  
Metropolitan Plumbing Supply, 5000 2nd Street, Long Island City, NY 11101

Nupro Co., 4800 E. 345th St., Willoughby, OH 44094  
Parker Hydraulic Valve Division, 520 Ternes Avenue, Elyria, OH 44035  
Parker Actuator Division, 9948 Rittman Road, P.O. Box 450, Wadsworth, OH 44281-0450

Parker Systems Division, 651 Robbins Drive, Box 3500, Troy, MI 48007-3500  
Pittsburgh Brass Manufacturing, Sandy Hill Rd., R.D. 6 Box 387-A, Irwin, PA 15642

Stacey/Fetterolf Corporation, P.O. Box 103, Skippack, PA 19474  
Stockham Valves & Fittings, Box 10326, Birmingham, AL 35202  
Swagelok Company, 5171 Hudson Dr., Hudson, OH 44236  
Tate Andale Inc., 1941 Landsdowne Rd., Baltimore, MD 21227  
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406  
Waukesha Bearings Corp., 405 Commerce St., P.O. Box 798, Waukesha, WI 53186

Whitey Co., 318 Bishop Road, Highland Heights, OH 44143  
William E. Williams Valve Corporation, 38-52 Review Avenue, Long Island City, NY 11101

Zidell Explorations, Inc., (Valve Division), 3121 S.W. Moody Avenue, Portland, OR 97201

### VIBRATION ANALYSIS

DLI Engineering Corp., 253 Winslow Way West, Bainbridge Island, WA 98110  
Vibranalysis Engineering Corp., 4380 S. Wayside, Suite 100, Houston TX 77087

### WATER PURIFIERS

Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024  
Atlas-Danmark Marine & Offshore Baltorpej, 154 DK-2750 Ballerup, Copenhagen, Denmark, TX 35177 Atlas DK  
Everpure, Inc., 660 N. Blackhawk Dr., Westmont, IL 60559  
MECO (Mechanical Equipment Company, Inc.), 861 Carondelet St., New Orleans, LA 70130

Riley-Beard, P.O. Box 31115, Shreveport, LA 71130

### WEATHER CHART RECORDERS

Alden Electronics, 40 Washington St., Westborough, MA 01581

### WELDING

Metallizing Co. of America, Inc., 321 So. Hamilton, Sullivan, IL 61951  
Miller Electric Mfg. Co., P.O. Box 1079, Appleton, WI 54912

### WELDING EQUIPMENT

Enerjee Ltd., 32 S. Lafayette Ave., Morrisville, PA 19067  
Erico Fastening Systems, Inc., 301 New Albany Rd, Moorestown, NJ 08057

### WINCHES AND FAIRLEADS

Fritz Culver, Inc., P.O. Box 569, Covington, LA 70434  
Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134  
McElroy Machine & Mfg. Co., Inc., Lorraine Rd., Industrial Seaway, Gulfport, MS 39501

Nashville Bridge Co., P.O. Box 239 Nashville TN 37202

Smith Berger Marine Inc., 516 S. Chicago St., Seattle, WA 98108

### WINDOWS

Kearfott Marine Products, A Singer Co., 550 South Fulton Avenue, Mt. Vernon, NY 10550

### WINDOW WIPERS

Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928

### WIRE/CABLE LUBRICATOR

Atlantis Services, Inc., 1057 Kings Ave., Jacksonville, FL 32207

### WIRE AND CABLE

Atlantic Cordage Corp., 60 Grant Ave., Carteret, NJ 07008  
Seacoast Electric Supply Corp., 225 Passaic St., Passaic, NJ 07055  
Seacoast Electric Supply Corp., 1505 Oliver St., Houston, TX 77007

### WIRE ROPE—Slings

Atlantic Cordage Corp., 60 Grant Ave., Carteret, NJ 07008  
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018

A.L. Don Company, Foot of Dock Street, Matawan, NJ 07747

### ZINC

Thermal Reduction Company, 1 Pavilion Avenue, Riverside, NJ 08075  
Smith & McCroken, 153 Franklin St., New York, NY 10013

# ADVERTISE IN THESE SPECIAL EMPHASIS ISSUES

BEST READ  
BECAUSE EVERY ISSUE  
IS CURRENT



SPECIAL NAVY  
COVERAGE

★ BONUS DISTRIBUTION  
AT MEETINGS & SHOWS

Subject to Change

## FOR MORE MARINE SALES

### NOVEMBER 1986 ISSUE

Advertising Closing Date—October 10

- **SNAME ANNUAL MEETING**  
Society of Naval Architects and Marine Engineers  
New York, New York—November 19-22
- **PLUS—FIFTH ANNUAL SNAME INTERNATIONAL MARITIME EXPOSITION**  
The most important U.S. marine industry show. For the fifth year, the prestigious Society of Naval Architects and Marine Engineers is sponsoring a trade show in conjunction with its internationally renown annual meeting and technical symposium in New York City.

The November special issue of MARITIME REPORTER will contain full details covering the entire technical program as well as the exhibition.

The November special issue will receive extra bonus distribution at SNAME.

- **PLUS—A** wealth of current marine business and technical information first.

### DECEMBER 1986 ISSUE

Advertising Closing Date—November 11

- **Outstanding Oceangoing Ships Annual**  
A review of the most important ships constructed in 1986, selected because of outstanding design, construction and performance qualities.
- **Special Navigations/Communications Equipment Review**

- **Naval Technology & Shipbuilding Edition**
  - Finalized U.S. Navy Programs for 1986-87
    - Latest Changes & Developments
    - Full Statistics

- **PLUS—A** wealth of current marine business and technical information first.

### JANUARY 1987 ISSUE

Advertising Closing Date—December 10

- **Special Workboat/Shallow Draft Industry Issue**

- **PLUS—A** wealth of current marine business and technical information first.

### FEBRUARY 1987 ISSUE

Advertising Closing Date—January 10

- 1987 NAVY ANNUAL
- U.S. Navy Shipbuilding Programs

- Naval Technology & Shipbuilding
- **PLUS—A** wealth of current marine business and technical information first.

## THE DOMINANT WORLDWIDE MARINE INDUSTRY MAGAZINE

- World's Largest Requested Total Circulation—100%
- World's Largest Circulation to Buying-Influence Readers
- Largest U.S. Circulation to Buyers
- Largest Circulation to Navy Buyers
- Full Market Coverage—Ocean, Offshore, Inland, Navy
- Best Quality Circulation Records
- Most Current Circulation Records
- Current Editorial Content
- Largest Number of Advertisers
- Largest Number of Advertising Pages
- Produces Largest Number of Sales Leads

FOR BEST  
ADVERTISING  
RESULTS

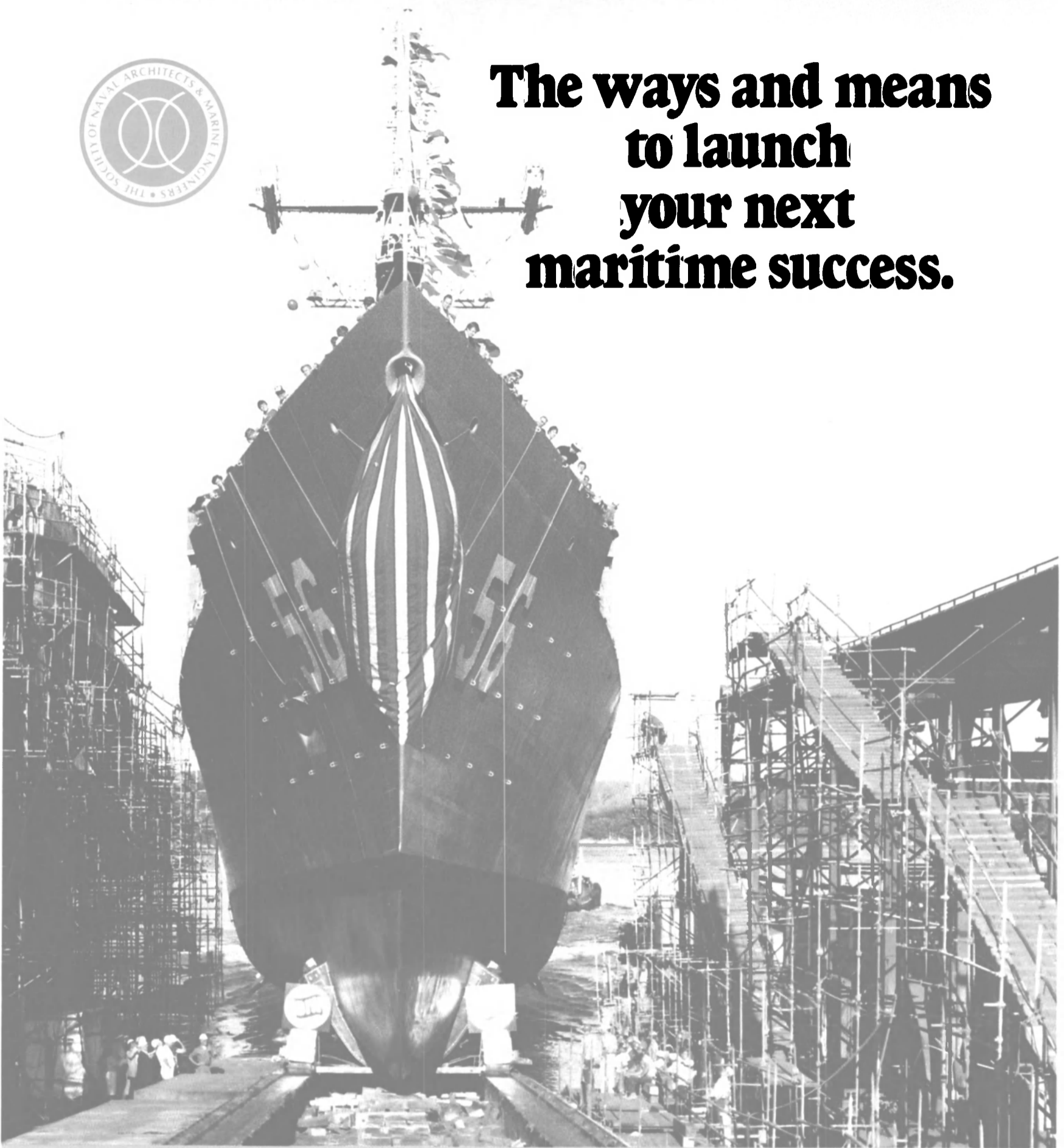
**MARITIME  
REPORTER**  
AND  
ENGINEERING NEWS

118 East 25th Street  
New York, NY 10010  
(212) 477-6700





**The ways and means  
to launch  
your next  
maritime success.**



**The Fifth International  
Maritime Exposition**

**November 19-21, 1986  
New York Hilton**

**During the 94th Annual  
Meeting of the Society of  
Naval Architects and  
Marine Engineers**

**SHOW HOURS:**

Wednesday, November 19: 2 pm to 6 pm

Thursday, November 20: 10 am to 6 pm

Friday, November 21: 10 am to 4 pm

From keel to truck, all the latest marine products and services will be on display at The Fifth International Maritime Exposition. It's an excellent way to preview and review the key offerings of your top suppliers. All at one time, all in one place. Sponsored again by the prestigious Society of Naval Architects and Marine Engineers (SNAME), this event promises to be a valuable learning experience for all who attend. And as in past years, you can attend whether you're a SNAME member or not. For free tickets to the exposition, contact the Reber-Friel Company, exposition management, 221 King Manor Drive, King of Prussia, PA 19406, (215) 272-4020.

Circle 116 on Reader Service Card

The largest shiplift platform in the world – 655 ft. long by 106 ft. wide at Todd Pacific Shipyards Corporation, Los Angeles Division.

# OVER 99% OF ALL SHIPLIFT OPERATIONS AROUND THE WORLD ARE ON SYNCROLIFTS®

There are very good reasons why Syncrolift is the world leader in shiplift technology with more than 160 installations in 59 countries. If you're planning a shipyard and comparing docking systems, find out why your best move is with Syncrolift.®

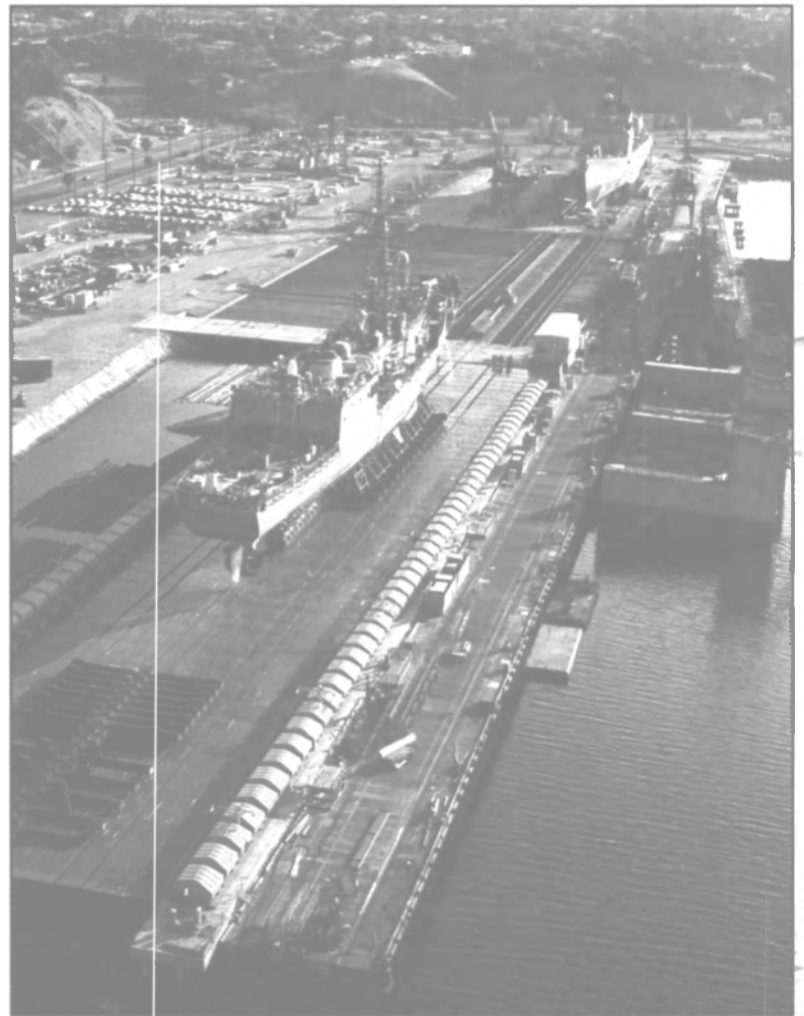


Photo by Joseph Ernest



The highest capacity per metre shiplift in the world – 200 tons per metre for launching concrete caissons at Yunotsu, Japan.

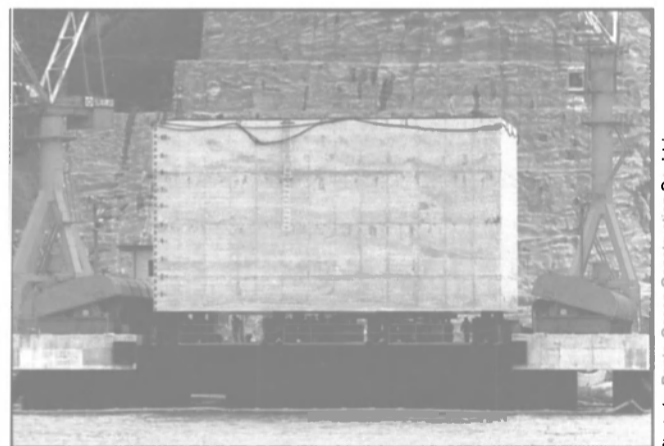


Photo by Penta-Ocean Construction Co., Ltd

The greatest lifting capacity shiplift in the world – 24,000 tons for nuclear submarines at Barrow-in-Furness, England.

# SYNCR® LIFT

World Leaders in Shiplift Technology

**PEARLSON ENGINEERING COMPANY, INC.**

8970 S.W. 87th Court, Miami, FL 33176 • U S A • (305) 271-5721 • Facsimile: (305) 595-5134  
Mailing Address: P.O. Box 560008, Miami, FL 33256 • U S A • Telex: 051-9340 SYNCROLIFT MIA

Circle 115 on Reader Service Card

A MEMBER OF THE  GROUP

Syncrolift Systems are patented in the United States and other countries.