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JULY 1989 ISSUE

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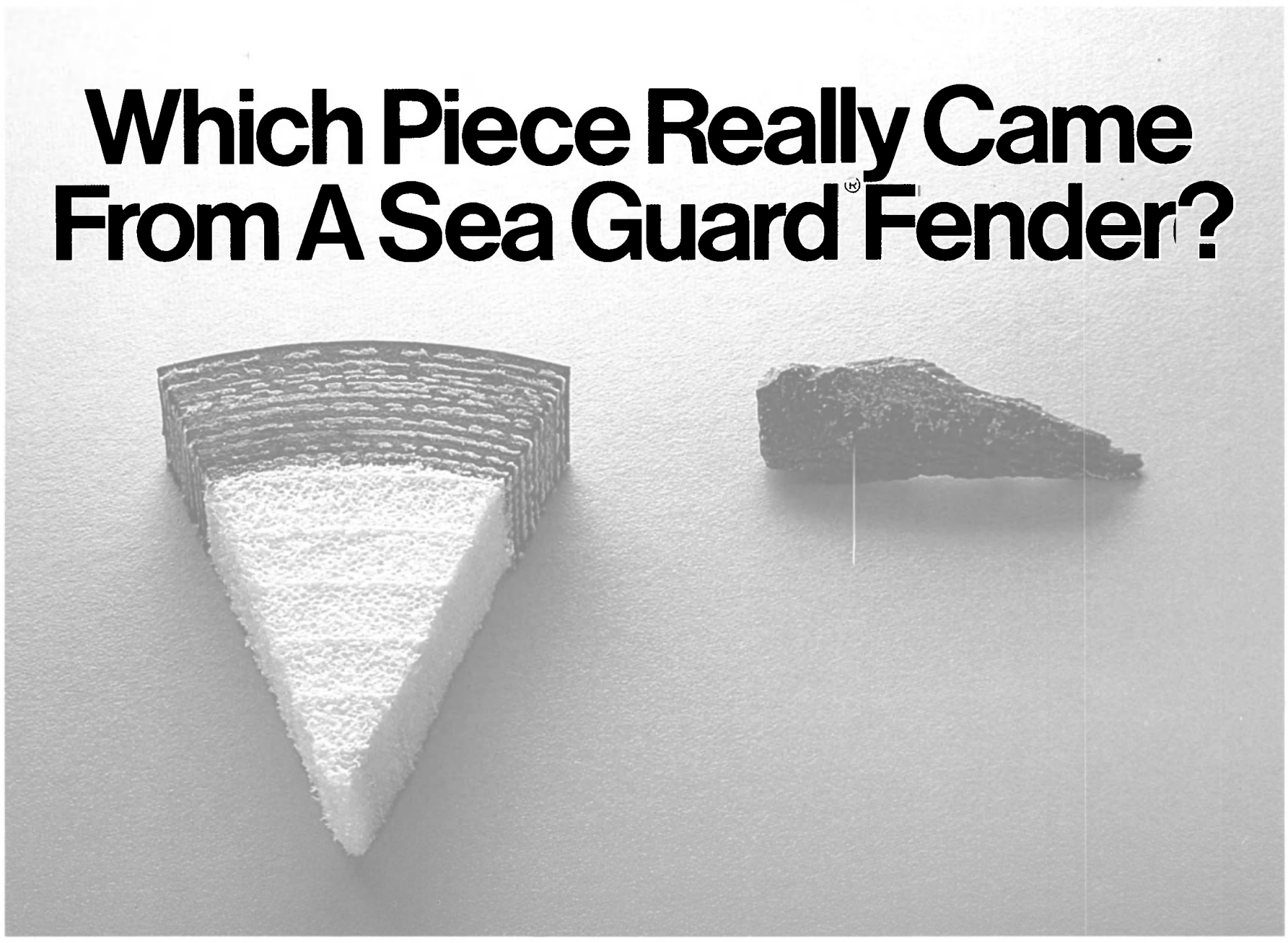
Which Piece Really Came From A Sea Guard® Fender?

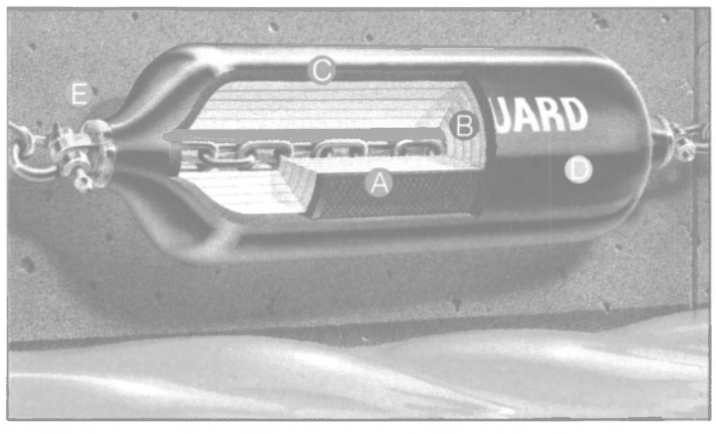


The piece on the left is of course from the Sea Guard® fender. The piece on the right was brought to us by an unhappy customer who thought one of our fenders had failed him.

It turned out to be one of our competitor's fenders. We can understand his confusion though, because there are other people making foam-filled fenders that look like ours. The problem is they aren't made like ours.

At Seaward, we make sure our fenders are up to spec. Consistently. Our Urethane skin is unique. It's reinforced with nylon tire cord wrapped in a helical pattern and integrated within the skin itself. Ⓐ This gives our skin a tear strength up to six times greater than non-reinforced skin.

We run a stringent Quality Assurance Program so you'll know you're getting only the best. Our closed-cell foam is tested in-house and carefully laid up to ensure the integrity of every fender. Ⓑ Sound impressive? There's more. The bond between the skin and the foam is stronger than the foam itself. Ⓒ And our staff chemists have formulated special elastomers and UV inhibitors to protect the fender and keep it looking good. Ⓓ We also use our integral galvanized steel swivels on the ends that allow the fender to rotate and reduce stress. Ⓔ



Through outstanding design, engineering and manufacturing Seaward International Sea Guard® fenders set the standard for the industry.

The result of all this is the best foam-filled fender made. Anywhere. Our fenders perform under the harshest conditions around the world. From the sizzling heat of South America to icy arctic waters.

We have fenders that have been in use longer than our competitors have been in the business. But that shouldn't be surprising since we pioneered and developed solid foam-filled fenders.

What we're trying to say is that while there are imitations on the market, no one builds fenders like Seaward. Whether it's our Sea Guard®, Sea Cushion® or Sea Float.

So the next time you're considering fenders, remember the lesson learned by the disgruntled customer mentioned earlier. Cheap imitations can be very expensive.

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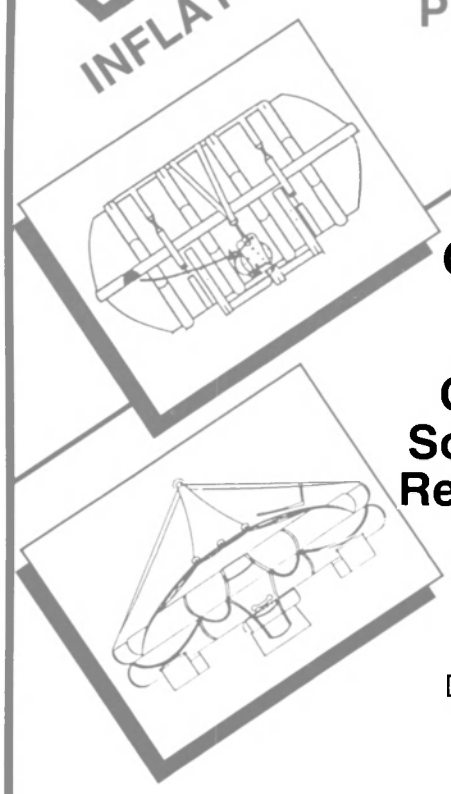

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ON THE COVER

Photos: Cover—The cruise ship, Song of Norway off St. Maarten (Royal Caribbean Cruise Line photo). Page 23—The USS Philippine Sea (CG-58) under construction at Bath Iron Works, Bath, ME (BIW photo). Page 25—The North Atlantic Treaty Organization Fleet at sunset (Navy photo).

General Crane Receives $5.4-Million Navy Pact

General Crane & Hoist, Richmond Hill, Ga., was recently awarded a $5.4-million U.S. Navy contract for electromechanical traveling cranes for the submarine tenders USS Simon Lake (AS-33) and USS Canopus (AS-34). The contract (N00024-89-C-4000) was awarded by the Naval Sea Systems Command, Washington, D.C.

Sealift Awarded $17.2-Million Contract

Sealift, Dover, Del., was recently awarded a $17.2-million firm-fixed-price plus reimbursables contract (including options) by the Military Sealift Command for the charter of the Bravado, a U.S.-flag tanker.

St. Paul Navigation Buys Florida Shipyard

Stewart F. Sumpton, president, recently announced St. Paul Navigation's purchase of Marine Inland Fabricators.

Marine Inland Fabricators manufactures workboats and barges at its Panama City, Fla., shipyard on Fannin Bayou.

The principal owners of the facility are **Stewart Sumpton** and **James A. Dye.**

For more information and free literature,

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Derecktor Awarded Repair Contract For USS Trippe

Robert E. Derecktor of Rhode Island, Inc., Middletown, R.I., has been awarded the drydocking and repair contract for the 438-foot USS Trippe (FF 1075). The contract, valued in excess of $1.5 million, is in response to the Navy's request for a proposal to repair the damage recently sustained to the vessel during naval exercises.

For free literature giving full details on the facilities and capabilities of Robert E. Derecktor shipyards,

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SNAME To Sponsor Symposium, Announces Call For Papers

The Society of Naval Architects and Marine Engineers (SNAME), New York Metropolitan Section, will sponsor a ship operation, management and economics symposium to be held April 26, 1990 at the U.S. Merchant Marine Academy in Kings Point, N.Y. Topics to be covered by the symposium include crew reduction, maintenance and repair, navigation, insurance, ships of the future, shipboard management and others.

Authors who wish to propose a paper responding to one of the areas listed are asked to submit an abstract of 500 words or less to **Richard A. Gilmore**, Energy Transportation Corporation, 1185 Avenue of the Americas, New York, N.Y. 10036. Abstracts must be submitted by August 1, 1989, and authors will be notified of acceptance by September 15, 1989.

Further information and a complete list of topics may be obtained by contacting the same address.

Versatile Pacific Begins Construction Of Canadian Coast Guard Rescue Ships

Versatile Pacific Shipyards Inc. has begun the construction of two Type 500 Search and Rescue ships for the Canadian Coast Guard under a C$35.2-million contract.

Upon completion the ships will have an overall length of 164 feet, molded breadth of 36 feet and loaded draft of 13 feet.

The Type 500 SAR cutters will be built to ABS class A1/ACCU (E) requirements. The first of the two vessels is due for delivery from Versatile Pacific's Victoria Division shipyard on January 15, 1990; the second May 30, 1990.

For free literature detailing the facilities and capabilities of Versatile Pacific,

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L & L Oil Stocks Wide Variety Of Standard And Custom Lubricants

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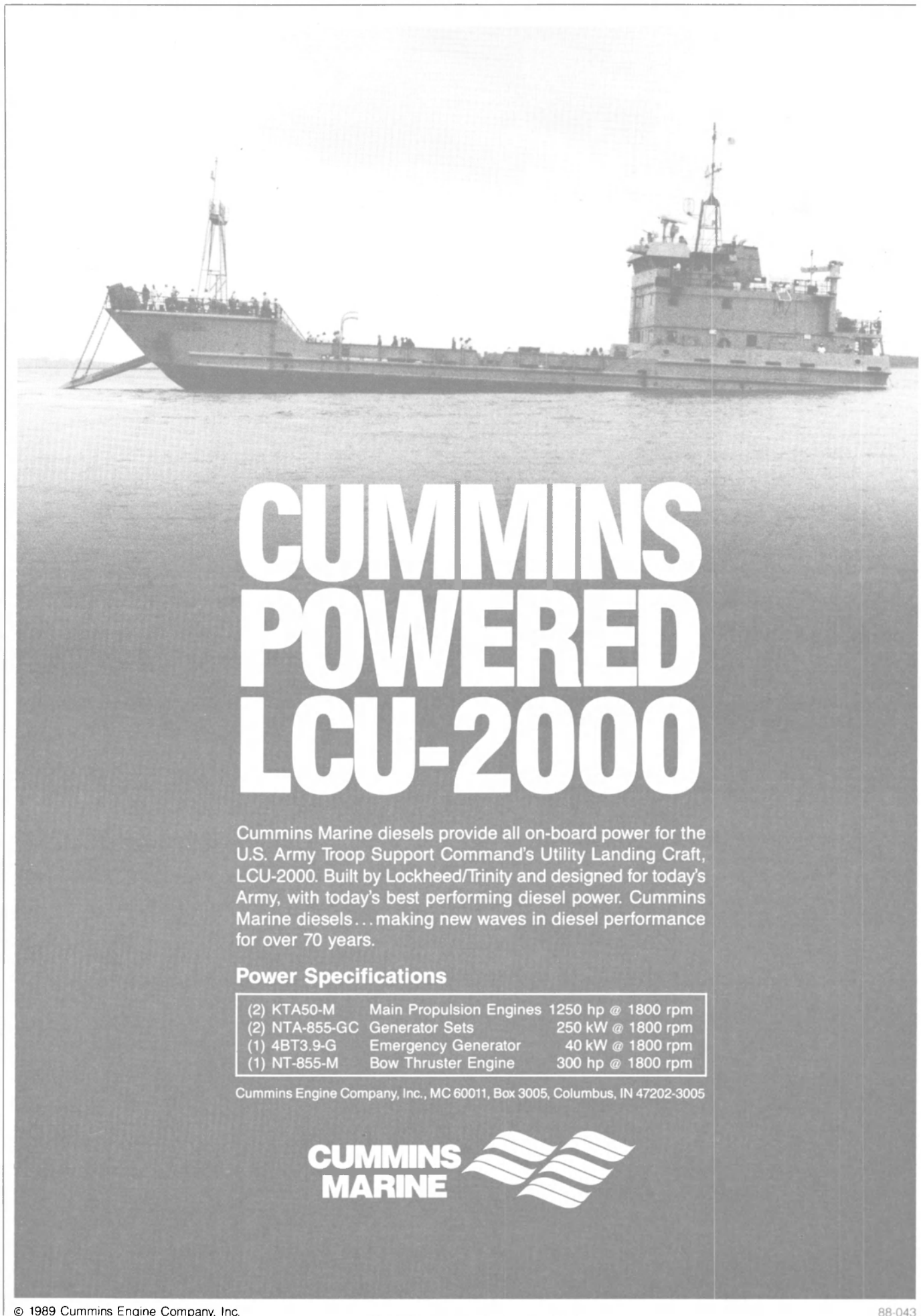

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Wagner Marine Names Great Lakes Marine Midwest Representative

Wagner Marine (USA) Inc., the U.S. subsidiary of Wagner Engineering, Ltd., recently announced the appointment of Great Lakes Marine Marketing of Port Clinton, Ohio, as their Midwest sales representative.

Great Lakes Marine Marketing will be responsible for sales of Wagner Steering and Autopilots in Ohio, Indiana, Illinois, Michigan, Minnesota, Wisconsin, Kentucky and Missouri.

For free literature giving full information,

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SPD Technologies Acquires Unit Of General Signal

Philadelphia-based SPD Technologies, one of the largest producers of military circuit breakers and a leader in advanced electrical protection equipment designed for harsh operating environments, has announced an agreement to acquire the Henschel Division of General Signal Corp.

Henschel, based in Newburyport, Mass., is a leading producer of advanced electronic ship control and internal communications systems.

SPD President **George M. Gordon** said the acquisition significantly expands SPD's breadth of products and services for naval markets in the U.S. and around the world, while also adding a position in the commercial marine equipment sector.

For further information,

Circle 80 on Reader Service Card

Fairbanks Morse Appoints W.H. Martin Director, Parts Sales And Marketing

Warren H. Martin

Fairbanks Morse Engine Division recently announced the appointment of **Warren H. Martin** to the position of director, parts sales and marketing.

Mr. **Martin** comes to Fairbanks Morse Engine Division from the Energy Services Group of Cooper Industries in Mt. Vernon, Ohio. In the 10 years he served that company, he held the positions of inventory supervisor and product marketing manager, as well as parts sales manager for the Eastern region. He has extensive marketing and sales experience in the parts area.

Todd-Seattle Awarded $26.7-Million Contract For USS Chandler

H.K. Schaefer, president of Todd Pacific Shipyards Corporation, recently announced that the Seattle Division has been awarded the Regular Overhaul (ROH) and "New Threat Upgrade" Navy contract for the USS Chandler (DDG-996). The $26.7-million contract will commence August 25, 1989, and is scheduled to be completed August 31, 1990.

The Kidd-Class destroyer will be equipped with new anti-air warfare fire control systems which will provide precise detection and tracking of "high-angle" anti-ship missiles, with which the Soviets' newest long-range naval bombers, the Backfire and Blackjack, are equipped. The contract will support an additional 350 jobs in the shipyard.

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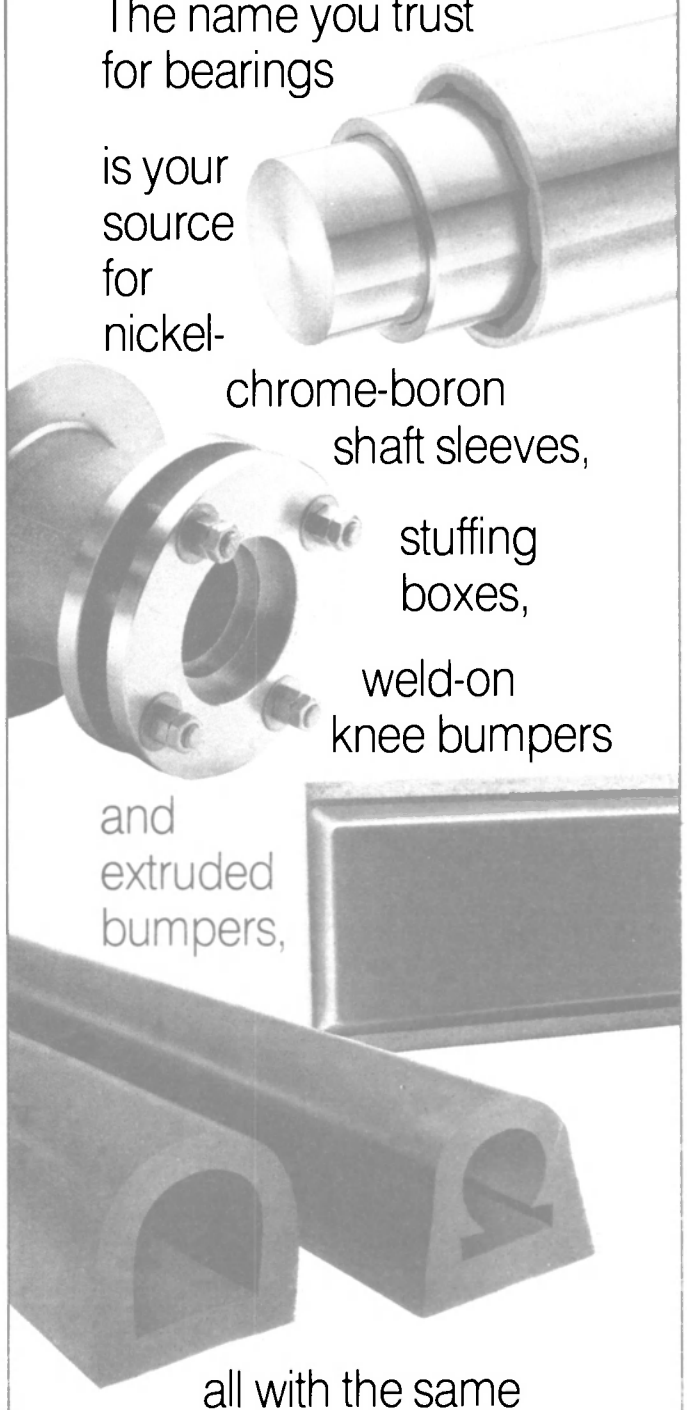

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The 4,200-hp J.A. Bisso II is one of three oceangoing tugs E.N. Bisso and Son, Inc. is employing in its new long-distance towing activity. The tug is 125 feet in length with a beam of 29.6 feet. E.N. Bisso and Son operates 13 tugs in the New Orleans harbor.

E.N. Bisso And Son Begins Long Distance Towing

E.N. Bisso and Son, Inc., long a fixture in towing, heavy lift and marine contracting at the Port of New Orleans, has branched into ocean towing.

The company announced that three of its powerful tugs, all cleared by the U.S. Coast Guard for offshore work, are available for rig towing, salvage, and long-distance barge towing "anywhere in the Western Hemisphere."

This includes the Atlantic Coast, Gulf of Mexico, Caribbean Sea, and Mississippi River, according to Capt. **Ralph Diaz,** general manager.

Tugs available for long-distance assignments are the 4,200-hp J.A. Bisso II, 3,600-hp A.T. Higgins, and the 2,400 C.D. White. The latter two vessels, recently acquired, are undergoing minor repairs and ABS inspection.

Acquisition of the two new tugs increases E.N. Bisso and Son's active fleet to 13. The company, well-known in the Port of New Orleans since 1880, also operates derricks with capacities up to 100 tons.

For free literature giving full details on E.N. Bisso and Son,

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Conrad Delivers 150-Foot Deck Barge

Conrad Industries, Inc., recently completed the Dixie-3, a 150- by 45- by 9-foot deck barge, at its shipyard on the Atchafalaya River in Morgan City, La. The Dixie Towing Corporation vessel will be used to transport prestressed concrete bridge members in waters in and around Jacksonville, Fla.

For further information on the vessel building capabilities of Conrad,

Circle 84 on Reader Service Card

OCEANOGRAPHIC SHIP KEEL-LAYING—Principals at the keel-laying of the U.S. Navy AGOR-23, a 274-foot oceanographic research ship under construction at Halter Marine, Inc., Moss Point, Miss., are, left to right: **Brian Lewis,** AGOR-23 project director, University of Washington; **Ray Helveston,** SUPSHIP, Pascagoula AGOR-23 deputy officer; **Robert Hinton,** on-site representative, University of Washington; **David Little,** NAVSEA assistant program manager; Capt. **Charles Martinek**, commanding officer, Naval Oceanographic Office; Capt. **Michael Simpson,** SUPSHIP Pascagoula; **John Dane III,** president, Trinity Marine Group; **Harvey Walpert,** vice president, Trinity Marine Group; **Paul Myers,** AGOR-23 program manager, Trinity Marine Group; **Vincent Almerico,** vice president, Trinity Marine Group; and Lt. Comdr. **J.N. Andrews,** SUPSHIP auxiliary and small craft project officer. AGOR-23 will be operated by the University of Washington. The two most recent Navy oceanographic ships, the Moana Wave (University of Hawaii) and the Gyre (Texas A&M) were also built by Halter Marine, Inc.

For free literature on the facilities and capabilities of Halter Marine,

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Ulstein Hatloe To Build Icebreaking Vessel

Norwegian shipbuilder Ulstein Hatloe recently won an order to build a 298-1/2-foot icebreaking passenger vessel for Rieber Shipping of Bergen, Norway.

Although primarily intended for use as a support vessel in Arctic and Antarctic expeditions, the Polar Circle will have the capacity to carry 120 passengers for cruise trips.

The 2,500-dwt vessel will have a breadth of about 59 feet, draft of 21 feet, and will be powered by two Bergen Diesel BRM8 main engines, each developing 3,000 kw at 720 rpm.

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$200 Billion Needed Over Next Decade For World Fleet Replacement

Shipowners, shipbuilders and bankers were told at a recent meeting in London that as much as $200 billion will be needed over the next decade to replace the world's aging shipping fleets. **Rex Harrington**, of the Royal Bank of Scotland, forecast that capital markets would play a much greater role in funding fleet replacement programs.

Addressing over 300 delegates at a seminar organized by City University's International Center for Shipping, Trade and Finance, Mr. **Harrington** said: "In order to raise the substantial amount of money required, the industry will need to be able to assure serious long-term investors that the returns will be less volatile than in the past. There will need to be a much greater collaboration between owners and charterers to achieve the right climate for the amount of investment required."

Shell International Marine managing director **Juan Kelly** warned the seminar that a "pressure cooker" effect was in the making, with the price of newbuildings outstripping the slower pace of increase in freight rates. This inhibited major ordering of new vessels and could lead to a tonnage shortage and, in turn, a dramatic rise in freight rates.

Mr. **Kelly** urged all concerned to exercise "universal self-constraint." He said that an appropriate response would involve "building new ships to replace operationally unsuitable or unserviceable ones, in numbers and of a size which main-

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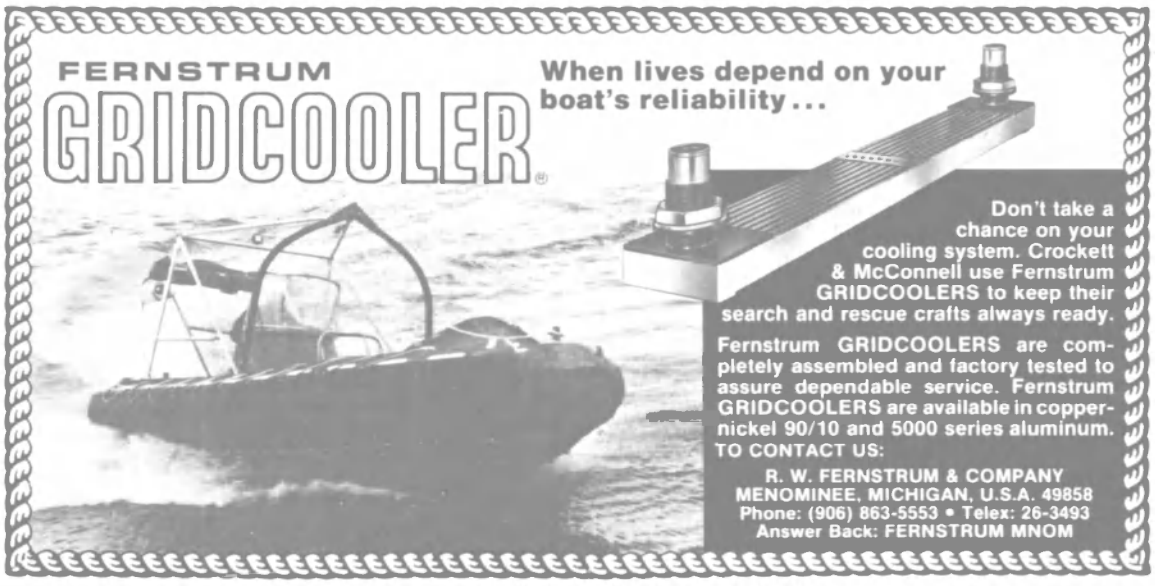

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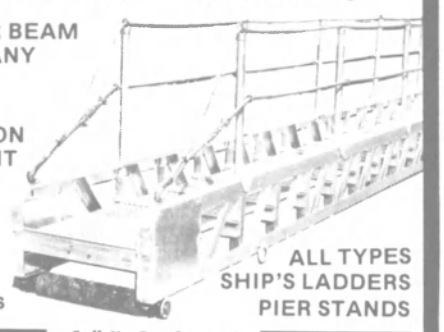

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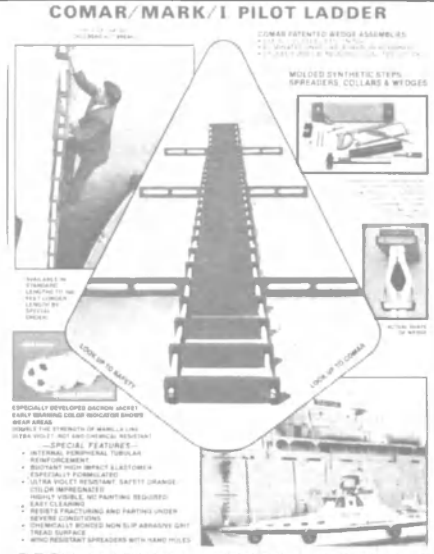

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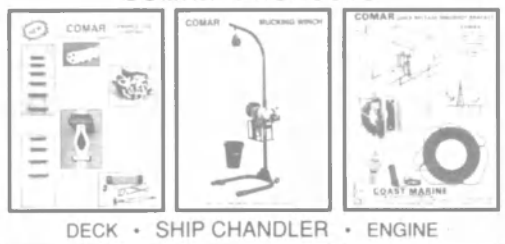

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tain a broad balance between supply and demand."

Basil Papachristidis, chairman of Papachristidis (UK), said the major oil companies' role as investors will have a major influence on the health of the international tanker market in the years ahead. He called on the oil companies to resist the temptation to implement newbuilding programs in response to anticipated tonnage shortages.

Greek shipowner **Nikolas Tsakos** told the seminar that world fleet renewal required building at the rate of some 20 million tons deadweight annually, costing up to $15 billion per year at present prices. He supported the view that capital markets would have to be harnessed to greater effect.

John Parker, chairman and chief executive of Belfast shipbuilders Harland & Wolff, forecast a doubling of demand for new vessels by the mid-1990s. He said: "Newbuilding prices will undoubtedly substantially increase and freight rates must inevitably reach levels which support new shipbuilding prices. A key question is 'When will the shippers be forced to recognize the inevitability that the revenue balance must be restored for the shipowner and the shipbuilder to satisfactory commercial levels.'"

Costas Th. Grammenos

Prof. **Costas Th. Grammenos**, director of the International Center for Shipping, Trade and Finance, told the seminar: "In order to attract the risk adverse institutional investor, risk management in shipping will have to play a more prominent role through the increased adoption of maritime joint ventures, shipping pools and currency and interest rate hedging." Professor **Grammenos** also underlined the importance to the maritime industries of the accelerating trend of transnationalization in production and services, "which has a major bearing on geographical shifts in production sites and changes in the flows of raw materials, production inputs and finished goods, as well as significant repercussions on national trade balances and economic policies."

Proposed T-Boat Rules Changes To Affect Lifesaving Equipment

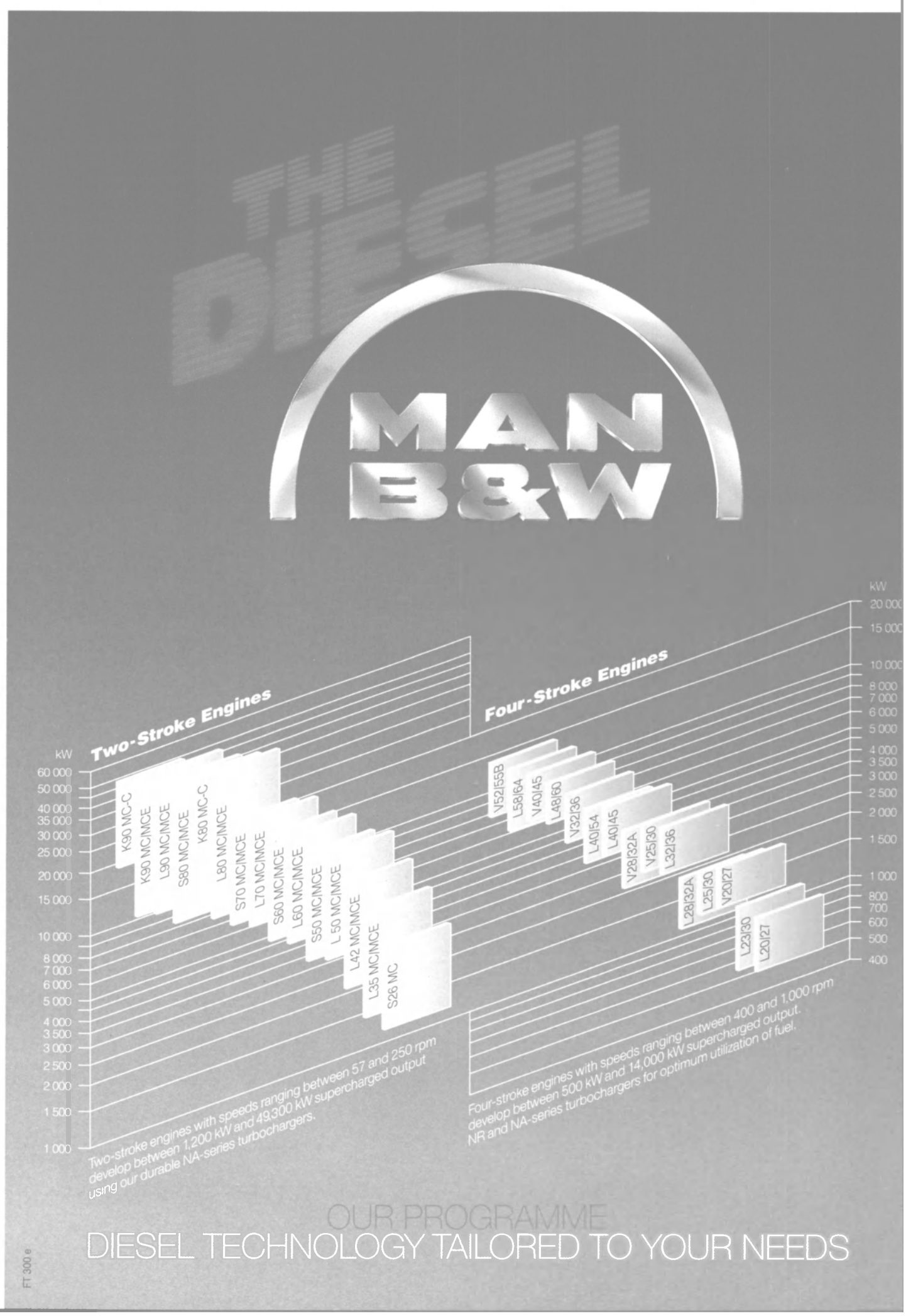
The U.S. Coast Guard recently issued a proposed list of significant changes to regulations to improve the lifesaving equipment carried by T-boats (passenger boats less than 100 tons in weight operating in coastal waters). The changes were prompted by the advance of technology—construction with modern materials means larger and more sophisticated craft within the 100-ton limit. Modern T-boats can carry many more passengers than when the regulations were written.

Viking, manufacturer of lifesaving equipment, suggests that it is not too early for T-boat owners and operators to begin interpreting these proposed changes, so each specific type of equipment will comply. As one of the world's largest designers and manufacturers of marine oceangoing safety equipment, Viking offers the services of its knowledgeable staff and worldwide resources to help with individual interpretations.

The proposed rules state that, generally, all other vessels would have to comply with existing survival craft requirements, except that a vessel carrying more than 150 passengers on lake, bay, and sound routes within 1 mile of land in cold water, must have 100 percent (non-inflatable) buoyant apparatus.

For more information and free literature from Viking,

Circle 99 on Reader Service Card



Circle 314 on Reader Service Card ➔

MSC Awards $15.6-Million Contract For U.S.-Flag ITB Charter

The Military Sealift Command (MSC), Washington, D.C., recently awarded a $15.6-million firm-fixed-price plus reimbursables contract (including options) to Puget Sound Tug & Barge, Seattle, Wash., for the charter of the Tug Seneca/Barge 255, a U.S.-flag Integrated Tug/Barge (ITB) combination ship.

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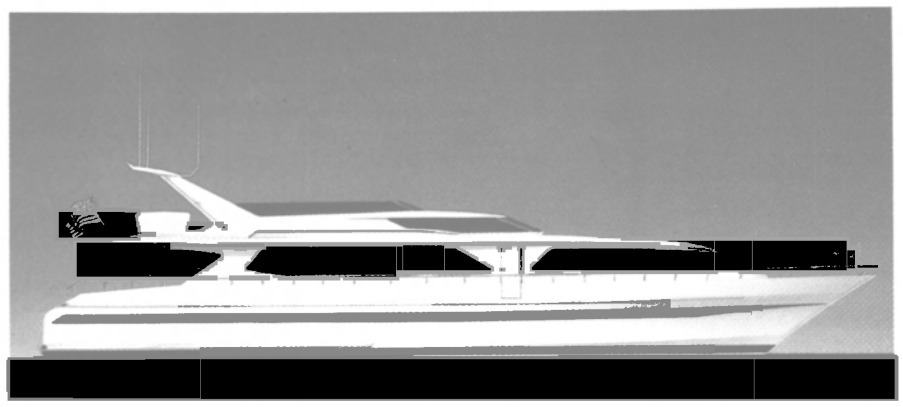


Artist's conception of the 97-foot-long motor yacht Leda. Her 4-foot 7-inch molded draft will permit the yacht to visit areas usually inaccessible to vessels this size.

Trinity Marine Group Enters Megayacht Construction With Establishment Of Trinity Yachts, Inc.

The Trinity Marine Group, reportedly the largest builder of small ships in the U.S., has entered the megayacht field with the establishment of Trinity Yachts, Inc. and the start of construction of the 97-foot, all-aluminum motor yacht Leda, designed by MPS-Gilgenast. It will be the first American-built yacht by the German designer.

Trinity Yachts Inc. occupies separate, dedicated facilities at Trinity's Equitable Shipyards facility in New Orleans, La.

In making the announcement, **John Dane III**, president of the shipbuilding group, said: "Megayachts are a natural progression for us because we have the experience, resources, quality workmanship, and production capacity to lead this segment of marine construction, just as we lead other aspects of the industry. There is a strong demand for U.S. yachts built to international regulatory standards with the quality of Northern European shipyards. We are proud to have been selected to build Gilgenast's first American yacht."

Mr. **Dane** said while some are just beginning to try to build to American Bureau of Shipping (ABS) and U.S. Coast Guard standards, nearly all of the larger vessels built by Trinity meet or exceed those and other regulatory standards including Lloyd's and Det norske Veritas.

He said Trinity shipyards were pioneers in the design and construction of high-speed aluminum crew boats, military patrol boats, surface effect ships, and innovative propulsion systems including turbine/water jets. He added that Trinity is also building ocean surveillance ships for the U.S. Navy whose diesel-electric and other systems rank these ships among the quietest in the Navy.

The new trans-Atlantic yacht, which will be owned by an East Coast yachtsman, will feature elegant styling and an easily driven hull form with a semi-displacement shape for seakeeping ability. She will have an overall length of 97 feet, molded beam of 23 feet and draft of 4 feet 7 inches.

Cruising speed at half load is expected to be 22.5 knots and the yacht will be built to American Bureau of Shipping standards and certified ABS, Maltese Cross A-1. AMS Circle E yacht service.

The new yacht will be powered by two MTU 8V-396-TB93 diesel engines developing a total of 2,574 bhp through ZF BW255 reverse/reduction gears. Stainless steel Aquamet 22 propeller shafts will turn highly skewed, four-bladed propellers to reduce cavitation and vibration.

Propellers and shafts will be located in tunnels which enabled MPS-Gilgenast to reduce the propeller shaft angle as well as the boat's draft. This propeller shaft arrangement also enables the engine room to be placed aft of the accommodations for better accessibility and reduction of noise and vibration while still using a straight drive arrangement.

For free literature giving complete information on the facilities and capabilities of Trinity Marine Group,

Circle **27** on Reader Service Card

Examples Of Application For JDN-Hoists Offered In 12-Page Color Brochure

J.D. Neuhaus has published a 12-page full-color brochure titled "Examples of Application for JDN-Hoists." The publication uses captioned photographs to illustrate how technical conveyance problem situations can be solved with JDN-hoists.

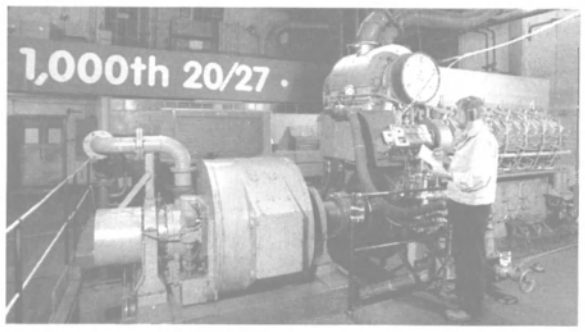
Included are examples of application of JDN-hoists in such areas as mining; ships, docks, offshore, including mounting of machines, lifting of cylinder heads, changing of engine parts, transportation of hatch covers, etc.

A list of special features of JDN-Hoists is included.

For more information and a free copy of the 12-page full-color brochure from J.D. Neuhaus,

Circle **53** on Reader Service Card

MAN B&W Celebrates 1,000th 20/27 Engine To Be Sold



The 1,000th MAN B&W 20/27 engine recently underwent acceptance testing in the presence of the customer and representatives of the classification society. The engine is one of two 12V 20/27 engines (each developing 1,200 kw at 1,000 rpm) for the propulsion plant of a luxury yacht being built for an American owner by the Dutch yacht and shipbuilders C. van Lent & Zonen, La-Kaag.

A modest celebration took place recently at the Augsburg works of MAN B&W Diesel AG, commemorating the 1,000th 20/27 engine to be sold. The "celebrity" is one of two engines of the 12V 20/27 type destined for a 207-foot-long luxury yacht belonging to an American owner. The Dutch yacht and shipbuilder C. van Lent & Zonen, La-Kaag, is undertaking the building of this vessel.

A comparison with the first order for this engine, two sets of three 7L 20/27 engines as auxiliary gensets for two freighters, clearly shows the breadth of possible applications of this engine series. Of the 1,000 engines sold, 30 percent were used to propel tugboats, fishing vessels, passenger ships, ferries, motor coasters, inland waterway vessels, supply ships, dredgers, yachts, small tankers and many special-purpose vessels. A further 45 percent of these engines are installed as auxiliary gensets for electricity supply on board large merchant ships.

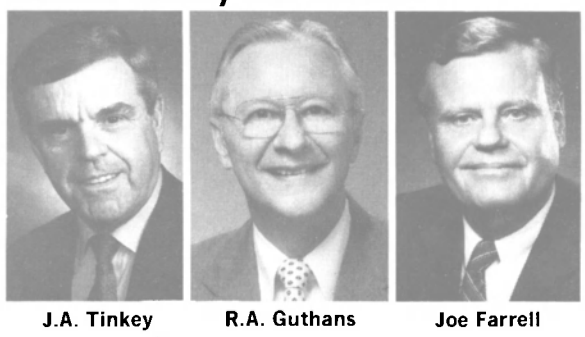
Low fuel consumption, a high availability of engines in operation and low wear values ensure that the L/V 20/27 engine will continue to be a popular choice in various markets in the future.

The MAN B&W 20/27 four-stroke engine is available as an in-line engine in 5, 6, 7, 8, and 9-cylinder versions, and as a V-type engine in 12, 14, 16 and 18-cylinder versions covering an output range between 500 and 1,800 kw at 1,000 rpm. The engine is also available as a dual-fuel version.

For further information and free literature on MAN B&W engines,

Circle 14 on Reader Service Card

Tinkey, Guthans, And Farrell Elected To Key AWO Posts



J.A. Tinkey | R.A. Guthans | Joe Farrell

The American Waterways Operators (AWO), the national trade association of the domestic inland and coastal barge and towing industry, has chosen its 1989 leadership. **J.A. Tinkey,** president, Mid-America Transportation Company, Fairview Heights, Ill., was elected chairman of the board; **R.A. Guthans,** president and chief executive officer of Tenn-Tom Towing, Inc., Mobile, Ala., was elected as vice chairman, and **Joe Farrell,** president of AWO since 1983, was reelected to that post.

Mr. **Tinkey** has been president of Mid-America Transportation Company since 1985, and has served that company since 1957 in such capacities as vice president-operations, vice president-traffic & personnel, superintendent of vessel maintenance, and as pilot and master on company vessels. He is a member of the River Industry Executive Task Force, which was formed at AWO's urging last year to deal with drought conditions in the mid-continent, and for which Mr. **Tinkey** and the Association have received national recognition. Mr. **Tinkey** has served in a number of key AWO posts, including that of Midwest region chairman. He is a member of numerous waterway-oriented organizations, and he brings to AWO vast experience and expertise in the maritime field.

Mr. **Guthans,** elected as vice chairman, has since 1973 served as president of Midstream Fuel Service Inc., Petroleum Energy Products Company, and Tenn-Tom Towing Company, all of Mobile, Ala. He is a past Southern Region chairman of AWO, and has served on the Association's board of directors and its executive committee.

'Rapid Response Team' Formed By ABS To Assist Clients When Vessels Are Damaged

The American Bureau of Shipping (ABS) has implemented a program called the "Rapid Response Team" that provides immediate assistance to shipowners and offshore operators to minimize casualty losses.

In the planning stage since late 1988, the Rapid Response Team concept is designed to expedite emergency services that ABS has offered to the marine industry for more than 125 years. The team's main objective is to assist shipowners and offshore operators with the critical job of assessing damage after a casualty and to provide recommendations for moving the vessel to a safe refuge.

ABS has developed two levels of rapid-response service. The first level provides clients with on-call review, analysis, and consultation based on information that ABS already has in-house on a given ship or offshore unit. On a second level, clients supply ABS with additional information—such as lines plans, pumping capacity—that allows ABS to calculate survivability, longitudinal strength, and damage and intact stability. ABS assesses this information using sophisticated computer programs to model the ship or offshore structure. These electronic models then enable the ABS Rapid Response Team to provide accurate and fast advice.

For further information on the ABS Rapid Response Team,

Circle 17 on Reader Service Card

Corrosion Protection Group Of Lukens Names Houghton VP And General Manager

Charles B. Houghton has been promoted to vice president and general manager of the Corrosion Protection Group of Lukens Inc. He is responsible for Energy Coatings Company (ENCOAT) and Cathodic Protection Services (CPS), both companies in the Corrosion Protection Group, headquartered in Houston.

ENCOAT is one of the leading suppliers of insulative and protective pipe coatings for the marine, oil, gas, petrochemical and utility industries of North America.

For further information,

Circle 30 on Reader Service Card

THE ULTIMATE IN HIGH-PERFORMANCE, STAINLESS STEEL TRASH COMPACTORS FOR SHIPBOARD OR DOCKSIDE SOLID WASTE DISPOSAL

Available in three sizes, highly efficient and simple to operate, the ICI Multi-Pak trash compactor system is ideal for shipboard or dockside solid waste disposal. With a compaction ratio of up to 20:1, stainless steel compaction chamber and stainless steel outer cabinet, it's the "state-of-the-art" solid waste disposal system for marine usage.

Don't just take **our** word for it. Ask the U.S. Navy, Cunard Cruise Lines, Chandris Fantasy Cruises, the Captain of the *Delta Queen*, the crews of the *Pacific Princess* and the *Island Princess* or any of our other highly-satisfied seafaring customers.

For a free analysis of your solid waste disposal needs:

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or 14719 Carolcrest, Houston, TX 77079

Circle 214 on Reader Service Card

The Detroit Diesel-powered Spirit Of Philadelphia is the eighth vessel in a fleet of sister ships built by Blount Marine.

Detroit Diesel-Powered 'Spirit Of Philadelphia' Delivered By Blount Marine—Its 277th Vessel

Blount Marine Corporation recently launched and delivered its 277th vessel, the M/V Spirit Of Philadelphia. The vessel was constructed for Holiday Cruises II, Inc., a subsidiary of Cruise International, owned by **Richard O'Leary** of Norfolk, Va., and is the eighth vessel in a fleet of sister ships built by Blount Marine.

SPIRIT OF PHILADELPHIA
List of Suppliers

Main Engines	Detroit Diesel
Reduction Gears	Twin Disc
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Auxiliary Engines	Detroit Diesel
Bow Thruster	Blount Marine
Steering System	Wagner
Stern Bearings	Cutless
Propeller	Spirit Marine
Freshwater System	Tait Pumps
Sanitary System	Lowara Pumps
Bilge Pumps	Jabsco
Fire Pumps	Gorman Rupp
Anchor Windlass	Blount Marine
Radar	Furuno
VHF	Raytheon
Depth Sounder	Data Marine
Monitors/Alarms	National Security
Compass	Dirigo

The launching ceremony took place in Warren, R.I. The ship's sponsor was Mrs. **Muriel McLintock,** wife of Vice Adm. **Gordon McLintock,** who served at the U.S. Merchant Marine Academy in King's Point, N.Y.

The 192- by 35- by 8-foot Spirit of Philadelphia will operate in Philadelphia Harbor and on the Delaware River and is certified for 600 passengers on three fully enclosed, carpeted, climate-controlled decks. The vessel carries a crew of 75 who are responsible for its operation, gourmet food preparation, three custom-made bars, and world-class entertainment.

For free literature giving full details on the facilities and capabilities of Blount Marine,

Circle 21 on Reader Service Card

VERO Offers Electronic Pressure Gauge For Testing Diesel Injectors —Literature Available

The EPG-1A electronic pressure gauge for diesel injector maintenance is now available for both shipboard and service shop use from VERO Corporation, Boulder, Colo.

The EPG-1A features three easy-to-read LED panels for fast, accurate readings of opening pressure and leak-down rates and can be used in testing injectors for high, medium and slow diesel engines.

Compact and lightweight, the EPG-1A is simple to install in existing test stands, easily calibrated and can withstand shocks that often damage hydraulic gauges. VERO reported that the unit is ideal for shipboard use and enables ship's personnel to obtain excellent results when setting injector opening pressures and matching leak-down rates, critical for optimal fuel consumption and proper engine balance.

For more information and free literature,

Circle 5 on Reader Service Card

Koch-Ellis Barge & Ship Names John Thomas General Manager

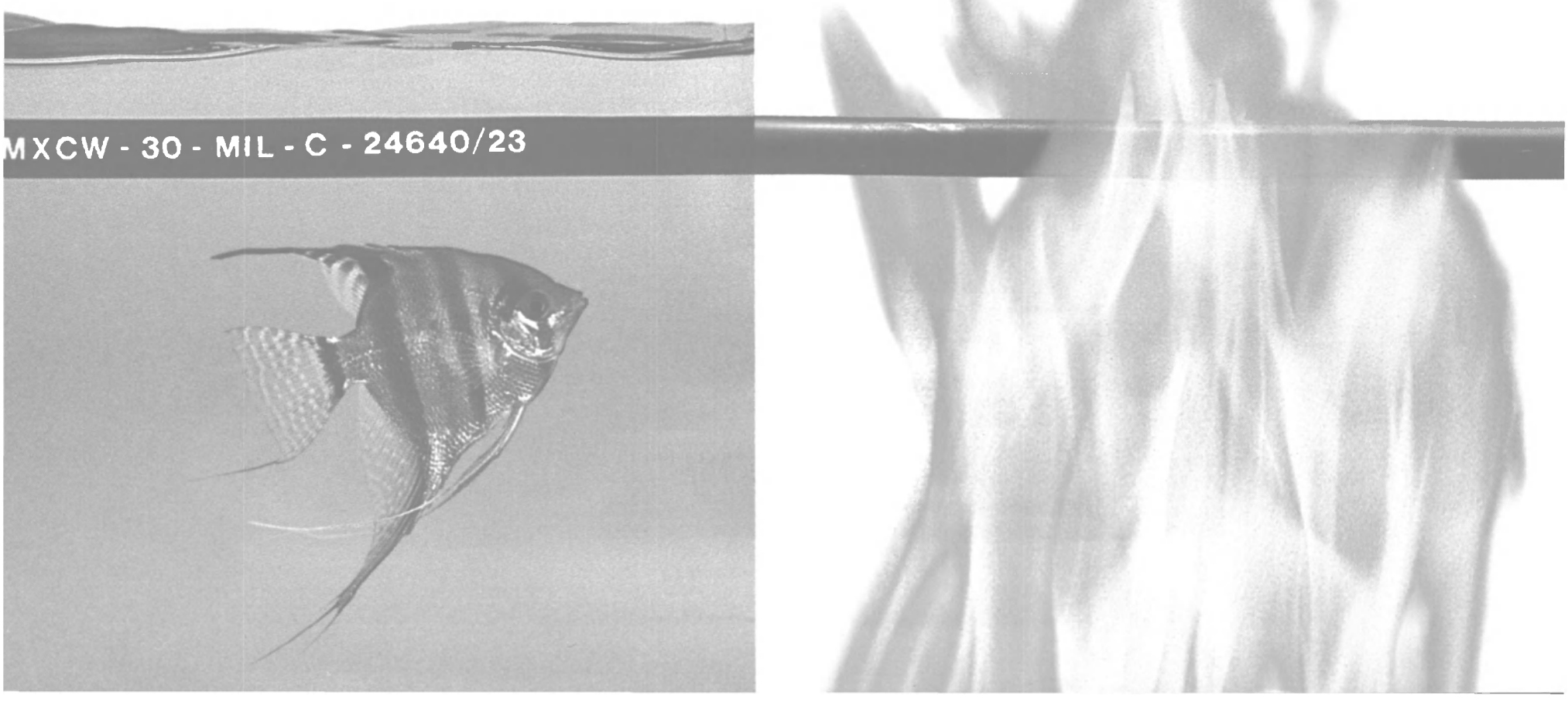
John Thomas

John Thomas has been promoted to general manager of Koch-Ellis Barge & Ship Service.

Mr. **Thomas** has worked for Koch-Ellis Marine for over 11 years. He was port captain supervising crews and vessels for Koch-Ellis Marine in the bunkering division.

As general manager of Koch-Ellis Barge & Ship Service, located in Marrero, La., Mr. **Thomas** will supervise office, sales and plant facility operations for the large barge and ship-cleaning/gas-freeing company. He will also serve as the company liaison with both EPA and DEQ government agencies.

Cable With KAPTON® And Mica. Under Water. Or Under Fire.



ELECTRONICS UPDATE

New Revolutionary River Radar System Launched By Kelvin Hughes

—Free Literature Available—

Kelvin Hughes Ltd. of England has launched a new revolutionary River Radar system, the RSR 1000, that has been designed to meet the rigorous standards of the new Rhine River Radar specification.

The RSR 1000 consists of only two compact units, a display and an aerial/transceiver, connected by a single cable. It can easily be fitted to a wide variety of vessels required to navigate in rivers and congested waterways.

The 20-inch display unit uses a technique that is unique to river radar applications to provide the close-range echo discrimination, called for in the new Rhine River specification, on a continuous bright 150% view ahead picture. The aerial/transceiver consists of a 2.4-meter antenna, 5-kw transmitter and wide-band width receiver combined in a lightweight unit which can be mounted up to 30 meters from the display.

Kelvin Hughes Ltd. RSR 1000 River Radar display unit.

For free literature giving complete information on the RSR 1000 River Radar system from Kelvin Hughes,

Circle 20 on Reader Service Card

National Waterways Conference To Hold Annual Meeting In St. Louis

Event Set For September 20-22, 1989

The National Waterway Conference's 1989 Annual Meeting will be held on September 20-22, 1989 at the Adam's Mark Hotel in St. Louis, Mo. Over the years, NWC annual meetings have gained wide recognition as timely, provocative programs featuring knowledgeable, articulate participants. The meetings serve as an invaluable rallying vehicle for coordinated action on waterways policy. Typically, more than 25 speakers, panelists and moderators are involved. Speakers have included Cabinet officials, Governors, Senators, Congressmen, industry leaders and others.

In addition to the keynote speakers, the 1989 Annual Meeting will include as many as six panel discussions and numerous opportunities for participants to develop important business contacts. Some 550 business, civic, and waterways executives attended the 1988 Annual Meeting in Nashville, Tenn.

For further information on the meeting, contact: **Harry N. Cook, Robert L. Freedman,** or **Donna J. Greenaway**, at the National Waterways Conference, Inc., 1130 17th Street, Northwest, Washington, D.C. 20036; telephone: (202) 296-4415.

General Electric Grants 'Quality-Award' To MWH

General Electric recently presented supplier Markisches Werk Halver (MWH) its 'Quality-Award' for not having had a single failure within 10 years. This award signifies that General Electric will rely solelyon MWH's quality control in the future and will not undertake its own "goods-in" quality inspection.

The award is important for MWH because out of 1,500 suppliers only 100 have been awarded with this distinction, and of these only three were European companies.

For many years quality and reliability have been the main characteristics of MWH's products. This means long service life, little maintenance, and consequently increased economy for the customers.

MWH can offer a wide range of products which covers valve spindles, valve cages, valve rotators, complete valve assemblies and accessories.

For more information and free literature,

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Nothing Performs Better

To help ensure the survivability of your ship, you need high reliability cable made with Du Pont KAPTON® polyimide film and mica, MIL-C-24640/19-24. Cable with KAPTON and mica is lightweight, compact, tough and watertight. It provides circuit integrity and is designed for low smoke generation.

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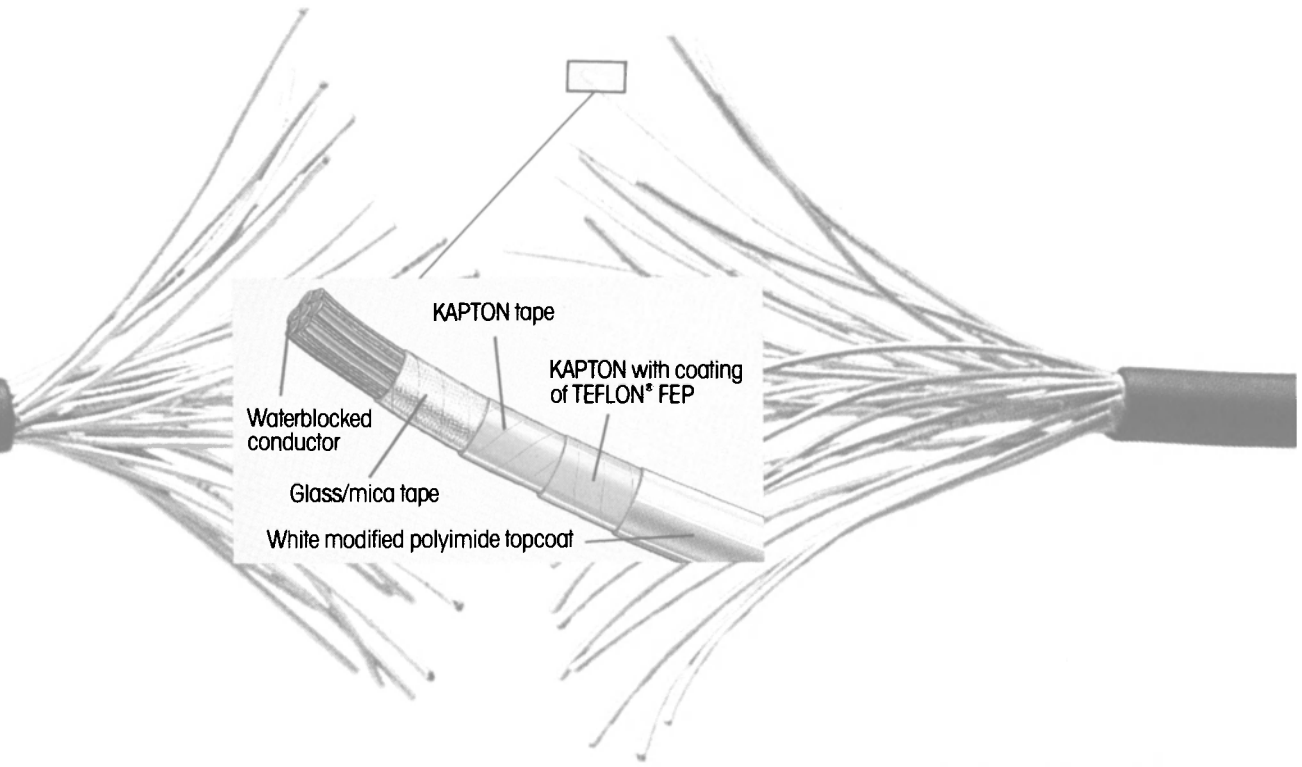

No other cable is as seaworthy, because no other cable combines all these critical performance features.

This is the only lightweight, compact construction that is waterblocked for use below the water line. It's half the weight and one-third the bulk of MIL-C-24643, providing improved maneuverability and ease of installation in tight quarters. And, cable with KAPTON and mica provides circuit integrity to ensure continuous communication and power transmission if the cable is engulfed by fire.

To find out how cable with KAPTON and mica, MIL-C-24640/19-24, can improve the critical performance of your ships, write to us for our free brochure: Du Pont Company, Shipboard Cable, Room G-51549-MR, P.O. Box 80029, Wilmington, DE 19880-0029.

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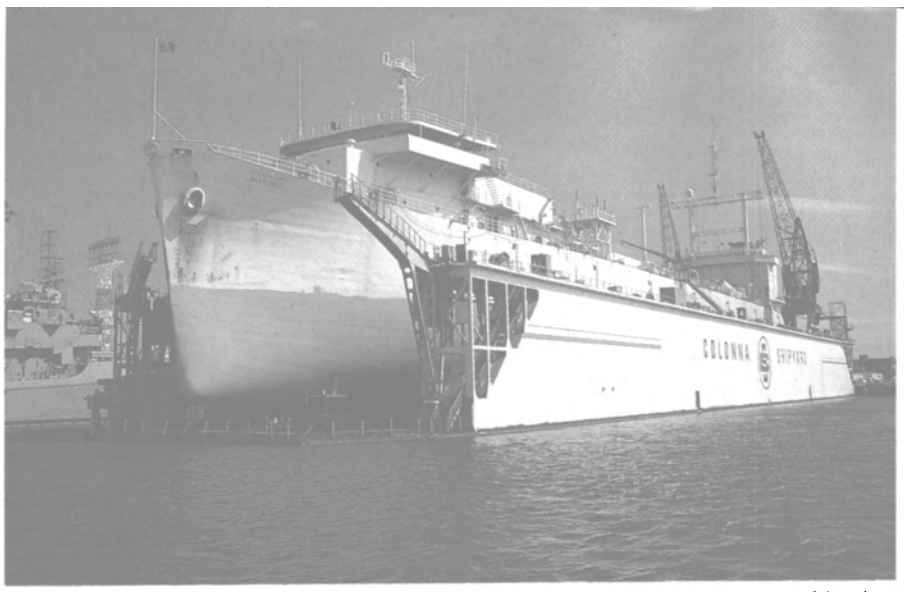
DU PONT



With a 17,200-ton floating drydock (shown above), three marine railways and a full array of ship and pier facilities, Colonna's is able to undertake a wide range of in-plant ship repair jobs for ships up to 800 feet.

Repair Contract For Third 'Knox' Class Ship In Seven Months

Colonna's Shipyard, Norfolk, Va., has been awarded a $3-million contract for repairs to the frigate USS Pharris (FF-1094). This is the third "Knox" Class ship to be awarded to Colonna's in the past seven months for similar repairs.

The contract calls for drydocking hull repairs, sandblasting and coating, boiler repairs, electronics and weapons repair, CHT modifications to the fin stabilizers and miscellaneous deck machinery repairs.

During the past 12 months Colonna's Shipyard has performed a wide variety of drydock and topside repairs on commercial vessels (large and small), and ships for MarAd, USCG, and the U.S. Navy. The vessel types range from deck, fuel, hopper and crane barges, cargo ships, tankers destroyers and frigates.

Colonna's Shipyard is located on the Eastern Branch of the Elizabeth River in Norfolk, Va. Founded in 1875, it is one of the oldest private family-owned full-service shipyards in the U.S. The yard provides ship repairs for commercial and government vessels up to 800 feet. Plant facilities include a 17,200-ton steel floating drydock, three marine railways and complete shop and pier facilities.

For free literature giving full details on the facilities and capabilities of Colonna's Shipyard,

Circle 23 on Reader Service Card

Unitor, Rochem To Merge Chemical Operations

The recently announced agreement concerning Unitor's intention to acquire the Swiss-based Rochem Group represents a significant development in the marine supply industry. Unitor, headquartered in Oslo and one of the world's largest suppliers of products and services for repair and maintenance on board ships, announced that it had agreed to acquire Rochem, a worldwide supplier of marine chemicals and related services.

As of July 1, 1989, Rochem will join Unitor Ships Service AS as a wholly owned company. It is the intention of both organizations to merge operations in areas where significant benefits can be obtained with economic advantage anticipated in logistics combined with increasing effectiveness in service and expertise.

For more information and free literature,

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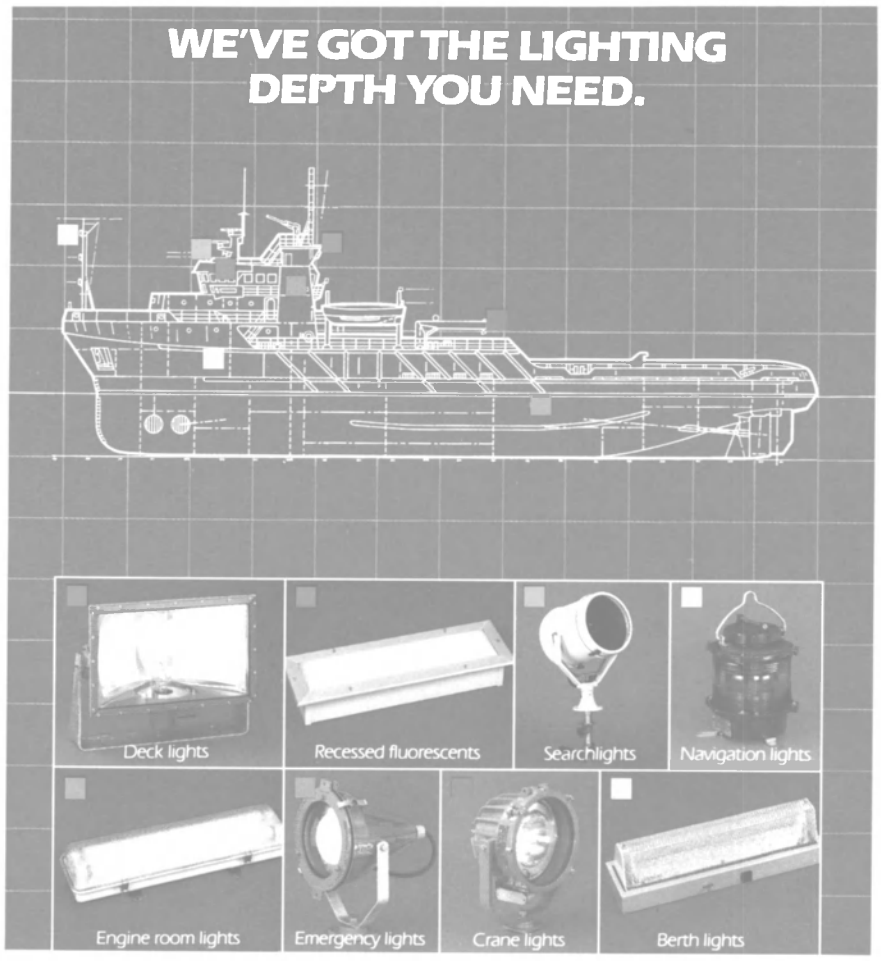

Regardless of your vessel's size, Phoenix can deck it out from stem to stern with the industry's widest line of domestically-manufactured quality marine lighting products. Choose from rugged vibration and weather resistant exterior floodlights, searchlights and navigation lights to marine-rated interior fluorescents for engine rooms, passageways, berth areas, holds and pilot houses. These include hazardous location and explosion-proof models. Phoenix can even design and build custom fixtures if needed. All thoroughly tested to survive a punishing life at sea. For a free brochure or information on a computer-aided evaluation of your vessel's lighting needs, contact PHOENIX PRODUCTS CO., INC., 6161 N. 64th St., Milwaukee, WI 53218; Phone 414-438-1200; TELEX 910-262-3389; FAX 414-438-1330.

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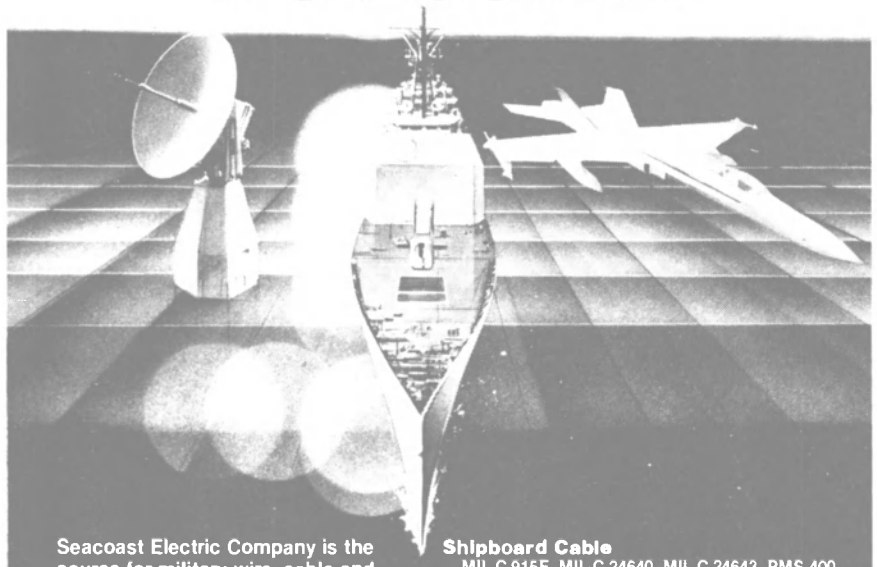
Seacoast



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We feature the largest and broadest inventory in the world, accompanied by custom designed "Just In Time" inventory management services.

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Military Wire and Cable
MIL-C-17, MIL-C-5756, MIL-C-3432, MIL-C-13486

Airframe/Aerospace Wire and Cable
MIL-W-81044, MIL W-22759, MIL-W-81381, MIL-W-27500, BMS#, BXS#, STS,GC,GW

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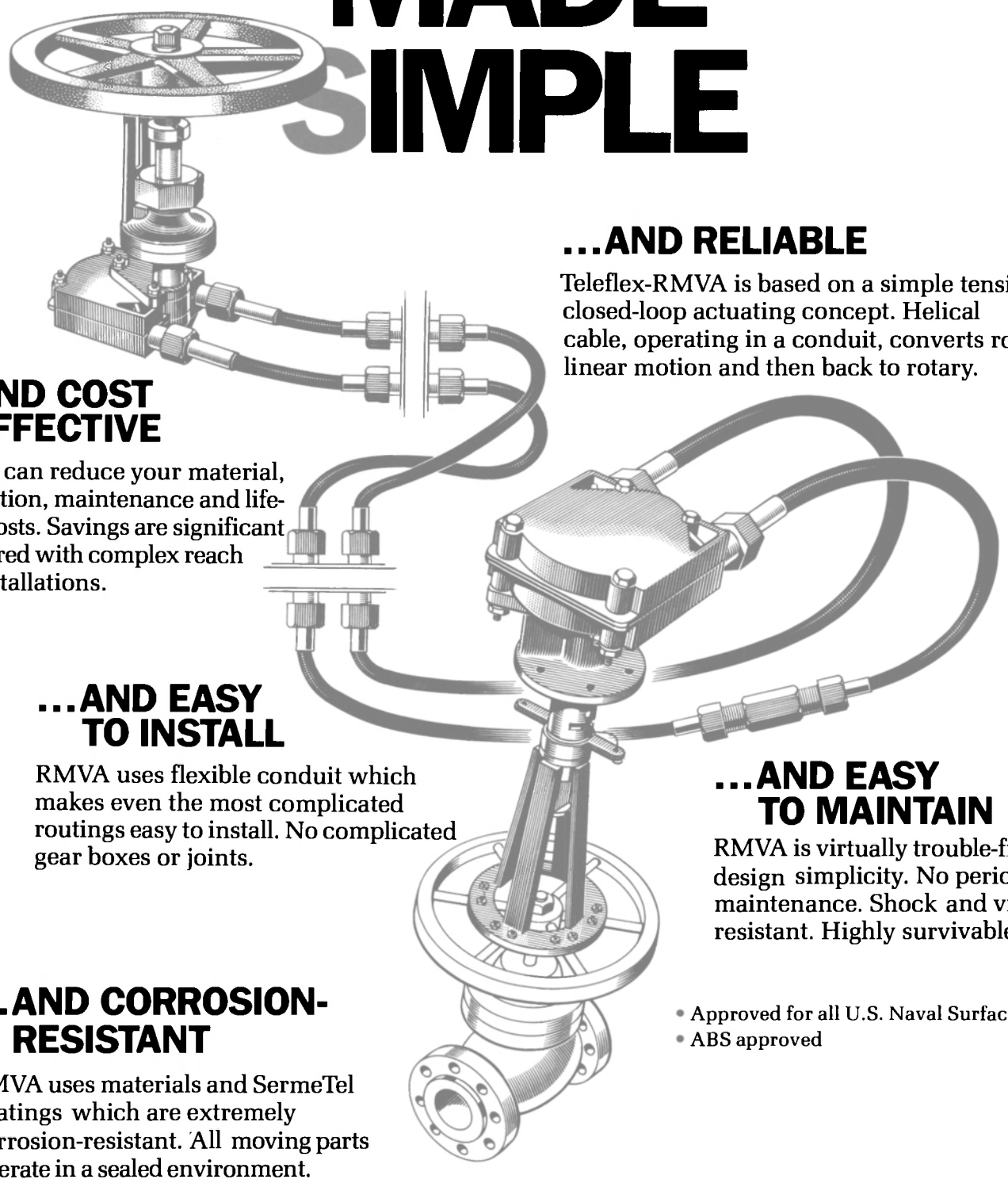

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RMVA can reduce your material, installation, maintenance and life-cycle costs. Savings are significant compared with complex reach rod installations.

...AND EASY TO INSTALL

RMVA uses flexible conduit which makes even the most complicated routings easy to install. No complicated gear boxes or joints.

...AND EASY TO MAINTAIN

RMVA is virtually trouble-free, due to design simplicity. No periodic maintenance. Shock and vibration resistant. Highly survivable.

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RMVA uses materials and SermeTel coatings which are extremely corrosion-resistant. All moving parts operate in a sealed environment.

- Approved for all U.S. Naval Surface Ships
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The Teleflex Remote Mechanical Valve Actuator (RMVA) has proven its dependability in cruel environments aboard naval vessels.

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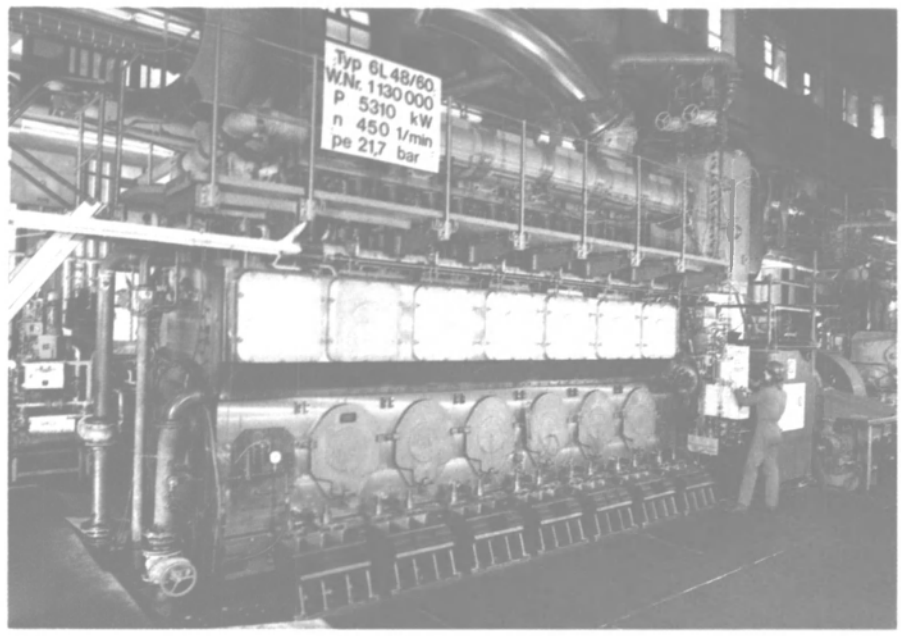
Circle 291 on Reader Service Card

PROPULSION UPDATE

New Medium-Speed Engine Presented By MAN B&W Diesel At Augsburg Press Conference

New Engine Diagnosis And Trend System Also Displayed



The most recent development in MAN B&W medium-speed four-stroke engines is the L48/60 engine with a cylinder output of 885 kw at 450 rpm. The photograph shows a six-cylinder engine on the test bench in Augsburg Engine Works.

MAN B&W Diesel GmbH recently held an international press conference and demonstration in Augsburg, West Germany, to present its latest addition, L48/60, to its large-bore medium-speed diesel engine family, as well as a new engine diagnosis and trend system from MAN B&W and AEG A/G of Hamburg.

At the conference, the firm introduced the entire three-member medium-speed engine family—the L58/64, L48/60 and L40/58—ranging in power from 3,300 to 12,000 kw (4,425 to 16,092 hp) at 400 to 514 rpm. MAN B&W demonstrated a model 6L 48/60 engine on the test bench at its Augsburg works. The new L48/60 plugged the output gap between the L58/64 and L40/54 with its 885 kw per cylinder at a speed of 450 rpm.

Also demonstrated at the conference was the MODIS-Geadit, a joint development of MAN B&W and AEG, an engine diagnosis and trend system.

Prior to the engine demonstration, a conference was opened by **Rudolf Rupprecht**, Dipl.-Ing., Dipl. Wirt.-Ing., the board of management, MAN B&W Diesel GmbH. Other company dignitaries speaking at the conference included: **Folker Bohm**, Dipl.-Ing., vice president of sales and marketing, who presented a paper on "Large-Bore Medium-Speed Engines in the Market of the 90s"; **Hanns-Gunther Bozung**, Dr.-Ing., vice president of engineering, who spoke on "Three Medium-Speed Engines—One Design Concept; Our Solution for the 90s"; Dipl.-Ing. **Lochbichler**, head of the engine design department; Dr. **Lausch**, who spoke on the MODIS-Geadit engine diagnosis system; and **Rudolf Erhardt**, Dipl.-Ing., vice president of diesel engine service, who presented the paper "QE2 Propulsion Plant—Our Service Philosophy in Practice."

Following the conference, the press was taken to test stand for a first-hand demonstration of a new model 6L48/60 diesel in a test bed. During the testing of the engine at normal operating speeds, several observers, some as close as 12 feet, commented on the lack of any discernible vibration. The demonstration verified the remarkable engineering feat that MAN B&W has accomplished with its new medium-speed family.

Beginning with the largest engine, the L58/64, MAN B&W has created an engine series for a class of top-rated engines designed with a view of achieving economy and reliability and equipped with every manner of future-orientated, technical and economical design characteristics.

With a piston diameter of 580 mm and a stroke of 640 mm, the L58/64 engine develops a cylinder output of 1,325 kw at a speed of 428 rpm, i.e., in the nine-cylinder version the engine is capable of an output of approximately 12,000 kw.

The "little brother," L40/54, which successfully completed its test bench trials at the end of 1987, with its cylinder output of 665 kw, is modeled on the basic design concept of the L58/64 engine, an engine that has since proved itself in operation in numerous ships' propulsion plants.

The L48/60 engine plugs the output gap between the 40/54 and the 58/64 with its 885-kw per cylinder at a speed of 450 rpm. This engine was also modeled on the same future-orientated design concept.

All three engines are supplied as in-line configuration engines with between six and nine cylinders.

The principle design features of the MAN B&W medium-speed engine generation include:

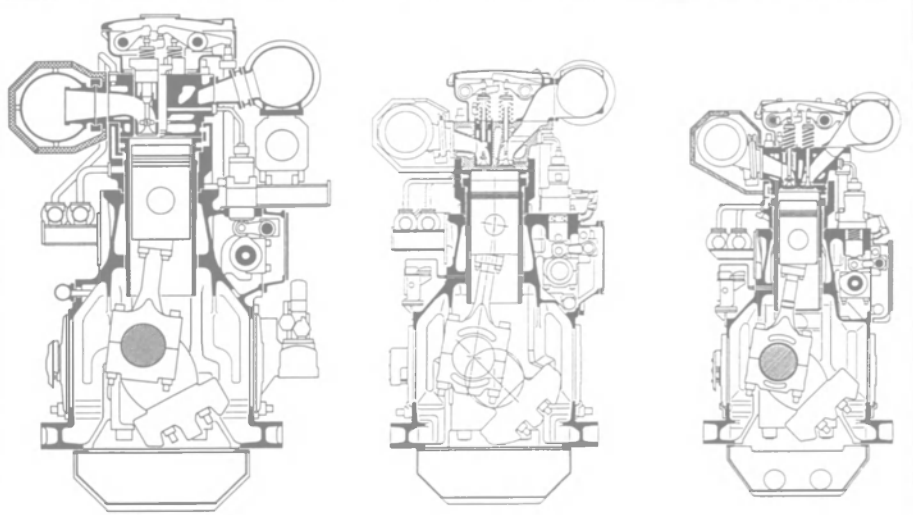
Rigid monoblock frame casing; underslung crankshaft; individual cylinder jackets, resulting in minimum deformation from gas and mass forces and thermal influences; connecting rod—optimized marine head design with parting line in the upper region of the rod shaft, i.e., extremely low overhauling height; exhaust valves arranged in cages resulting in simplified maintenance of components.

Also, propellers on the exhaust valve cones, resulting in rotation of the valve by the gas flow—valve seats remain free of deposits over many thousands of operating hours; fuel-optimized injection system with "economy plunger" and high-injection intensity; adjusting mechanism for optimizing the injection timing during engine operation; constant pressure turbocharging, i.e., higher turbocharger efficiency and low component temperatures; high compression ratio and correspondingly adjusted valve timing for problem-free and trouble-free HFO operation; consistently even exhaust gas temperature after turbine over a broad operating range ensures optimum utilization of waste heat.

MAN B&W exhaust gas turbocharger with a very high level of aggregate efficiency over the entire load range permits a part of the exhaust gas flow to be branched off and utilized in a turbo-compound system, thus raising the aggregate efficiency of the propulsion plant; resilient mounting of the engines—the rigid design makes it possible to arrange the resilient bearing elements directly on the engine lands.

Low maintenance requirement thanks to an optimized maintenance concept: with only three different hydraulic tools, all the main screw connections can be slackened and re-tightened; rocker arm covers can be opened without great physical exertion and fix themselves in the open position; and the design and arrangement of the rocker arms makes for swift and simple removal of the exhaust valves.

According to MAN B&W, their new generation of medium-speed engines offer further reductions in fuel consumption rates (85% ECR): L40/54—172 b/kWh, L48/60—169 g/kWh, and L58/64—167 g/kWh; lube oil consumption rates of less than 1 g/kWh; significant reductions in pollutant emission levels; extensive utilization of various engine waste heats, resulting in a high aggregate efficiency of the propulsion system; long wear component lifetime and thus a low spare parts requirement; a simple maintenance concept tailored to the practice of day-to-day engine operation ensures short maintenance and turnaround



Profiles of the three medium-speed MAN B&W engines, all modeled on the same design principles.

TECHNICAL DATA

	40/54	48/60	58/64
Engine type			
Cylinder bore	400 mm	480 mm	580 mm
Piston stroke	540 mm	600 mm	640 mm
No. of cylinders	6,7,8,9	6,7,8,9	6,7,8,9
Cylinder output	665 kw	885 kw	1325 kw
Speed	514 1/min	450 1/min	428 1/min
Mean piston speed	9.25 m/s	9.0 m/s	9.1 m/s
Mean effective pressure	22.9 bar	21.7 bar	21.9 bar
Fuel consumption at 85% ECR	172 g/kWh	169 g/kWh	167 g/kWh

times, which in turn means high engine availability and reduced manning levels.

Jointly developed by MAN B&W Diesel and AEG, the MODIS-Geadit assumes the task of an engine expert in diagnosing the engine condition. The system makes the expertise of the engine builders available to the engine operator.

Ignition and combustion behavior of the fuels and their influence on the engine operation are diagnosed using the software that has been utilized by MAN B&W in its engine development work.

The diagnoses are based on physical correlations, making MODIS-Geadit applicable for use in both two-stroke and four-stroke engine plants.

The MODIS-Geadit aids the engine operator in ensuring cost-effective operation of the ship by: (1) continuous diagnosis of the engine condition; (2) avoidance of operational disturbances—reduced downtimes and reduction of running costs; (3) targeted planning of maintenance work—TBOs lengthened and reduction of running costs; (4) support and decision aid for onboard personnel; (5) reduction in the risk of downtimes; and (6) electronic expert, knowledge permanently available and extendible.

The MODIS-Geadit can diagnose such events as: (1) contamination of the air intake filter, charge air cooler or exhaust gas boiler; (2) irregularities in combustion; (3) deterioration in the condition of injector pumps and nozzles; (4) deterioration in the condition of combustion space components; (5) engine operation in excess of permissible range; or (6) imbalance condition of the exhaust gas turbocharger.

For more information and free color brochures and literature detailing MAN B&W engines or the new engine diagnosis system MODIS-Geadit,

Circle 109 on Reader Service Card

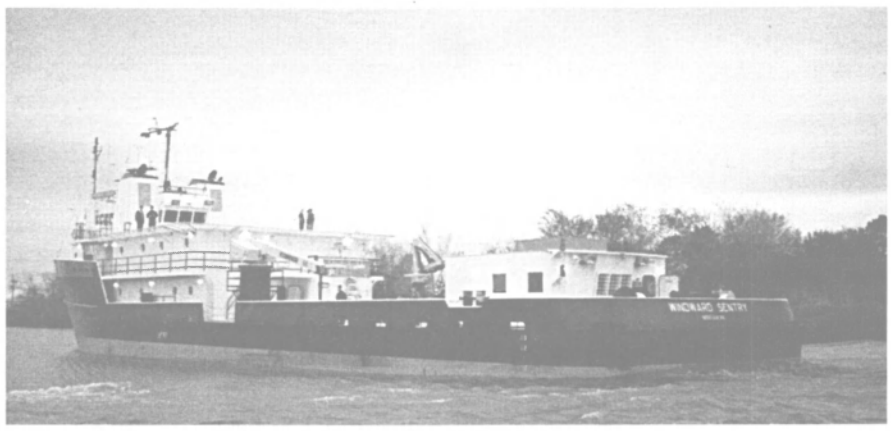
Hamanaka Offers 32-Page Full-Color Brochure On Chain Cables

Hamanaka Chain Mfg. Co., Ltd., a leading chain manufacturer in the Far East with international office in Houston, Texas, is offering a free 32-page full-color brochure on chain cables.

In addition to pointing out Hamanaka's main plant facilities, the generously illustrated brochure discusses characteristic features of the chain, the manufacturing process, loading and material test, research and development facilities, and heavy duty chain making. Equipment tables and testing requirement tables are also included along with an explanation of the manufacturing processes of rolled bar for chain.

For further information and a free copy of the 32-page full-color brochure on Hamanaka chain cables,

Circle 01 on Reader Service Card



The Windward Sentry will support the U.S. Coast Guard in its war on illegal drugs.

Halter Converts Supply Boat For USCG Drug Surveillance Mission

The offshore supply vessel Liberator, which once served rigs and platforms in the Gulf of Mexico, has been converted by Halter Marine, Inc., Lockport, La., to support the U.S. Coast Guard in its war on illegal drugs.

Now known as the Windward Sentry, the 192-foot by 40-foot vessel, built in 1979, will operate in the Gulf of Mexico deploying a large helium-filled balloon called an Aerostat, which is equipped with a sensitive radar system. Suspended as high as 2,500 feet, the radar scans the sky and the ocean to detect low-flying aircraft and surface vessels which could be carrying illegal drugs.

The extensive conversion included removal of the liquid and dry drilling mud tanks and their pumping systems; addition of fuel tanks raising the fuel-carrying capacity from approximately 60,000 gallons to over 200,000 gallons; increasing the crew quarters from 15 to 29; expansion and renovation of the galley and mess facilities; addition of the Aerostat structure which supports the balloon's revolving platform; addition of a crew lounge, electronics repair room and store room; addition of a hydraulically operated crane and davit, and complete tests, overhaul or replacement of all equipment and systems.

In addition, the pilothouse received an extensive package of new, increased-capacity navigation and communications equipment.

Electrical generating capacity was boosted by the addition of a third generator, and freshwater capacities were increased by the addition of two more watermakers and another high-volume water heater.

The conversion plan was designed by Rodney E. Lay and Associates of Jacksonville, Fla., for the Department of Transportation, U.S. Maritime Administration (MarAd). The contract was administered by the OMI Corp. of New York City, and the boat will be operated by a crew of General Electric (GE) Government Services personnel, while the U.S. Coast Guard will operate the surveillance systems.

All work was done under the inspection of, and certified by the American Bureau of Shipping (ABS) and the U.S. Coast Guard.

Halter Marine Inc. is part of the Trinity Marine Group which is owned by Trinity Industries, Inc., Dallas, Texas.

For further information and free literature,

Circle 26 on Reader Service Card

Crowley To Sell S.F. Bay Ferry Fleet

Crowley Maritime Corporation recently announced plans to sell its Red & White Fleet passenger ferry service, which operates in the San Francisco Bay area, to the Blue & Gold Fleet.

The sale, which is estimated to be at a price of about $30 million, involves Crowley's routes, services and fleet of nine passenger vessels.

APL Expands Asian Feeder Service

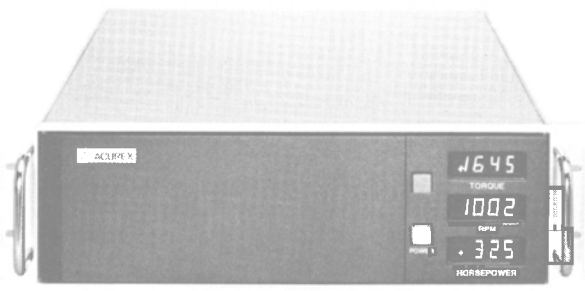
American President Lines has expanded its Asian feeder service with the addition of 14 chartered ships.

The vessels, ranging in capacities from 200 to 700 TEU, will be managed by the new company Eagle Express Carriers of Singapore.

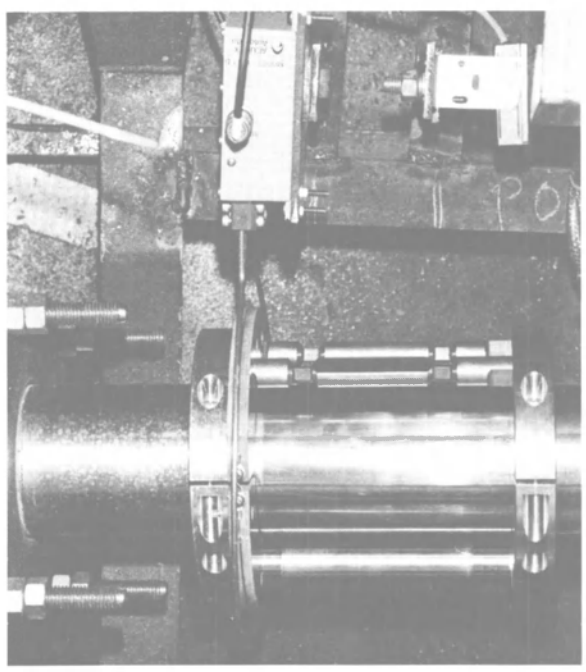
The added ships will enable APL to offer improved feeder connections.

Want to Simplify Main Engine Power Tests?

Specify Acurex Universal Sea Trials Measurement Systems! And Obtain Acurex Quality and Expertise as a Bonus.



- Bolt-on torque sensor—2½" to 30" shafts
- No critical clearances or locations
- Sealed sensor—patented design
- Installs complete in less than 4 hours
- Portable—hand carried aboard
- Not affected by diesel vibrations
- Monitors torsional vibrations
- All power and RPM ranges



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Circle 204 on Reader Service Card

DIESEL POWER REVIEW

Selecting the appropriate propulsion or auxiliary power system for a vessel is one of the most difficult and important tasks facing the naval architect, marine engineer and vessel owner. With so many marine diesel engines on the market—low-speed, medium-speed and high-speed units; two-stroke and four-stroke cycle designs; cross-head- and trunk-piston types; loop-scavenged styles; and conventional and opposed-piston machines—the editors of MARITIME REPORTER asked the major makers of marine diesel engines to provide information on their latest developments and advancements in the propulsion and auxiliary power field.

Free product literature is available from the manufacturers included in this review. To obtain copies of brochures and technical literature from the companies, circle the appropriate Reader Service Number(s) on the postpaid card bound in the back of this issue.

CATERPILLAR

Circle 69 on Reader Service Card

Caterpillar Inc., a multinational company headquartered in Peoria, Ill., recently announced it has adopted two new trademarks. These marks will identify the corporation and its products and services by the two words associated with the company throughout the world—Caterpillar and Cat.

The new marks capitalize on the traditional Caterpillar and Cat names by adding a stylized triangle design incorporated into the first "A" in each word.

The "CAT" mark will be the main identifier for products and services and the dealers who sell and support them. The "CATERPILLAR" mark will identify the company, its subsidiaries, its products and services, and will double as the official corporate signature.

Caterpillar offers the 3600 Engine Family of four-cycle engines, which has a bore of 280 mm and a stroke of 300 mm. The 3600 Family, with an engine speed range of 720 to 1,000 rpm, has four members: in-line six- and eight-cylinder versions, a V-12 and a 4,500-kw continuous-rated V-16.

After 10 years of development and over three years and 500,000 operating hours, the 3600 Family is a proven performer. Customers throughout the world are responding favorably.

Caterpillar designed the 3600 for efficient heavy fuel operation. Heavy fuel units are operating in the Great Lakes, Canary Islands, Belgium and Brazil. The first oceangoing containership to benefit from Cat 3600 heavy fuel auxiliaries was repowered last year.

Excellent fuel consumption is achieved by using a high-pressure unit injector combined with efficient turbocharging of the laboratory-developed combustion system. As a result, Caterpillar will guarantee specific fuel consumption dependent on fuel specifications.

A worldwide network of more than 200 dealers support Caterpillar marine propulsion systems with parts and service locations in more than 140 countries.

COOPER INDUSTRIES

Circle 61 on Reader Service Card

Superior® 2400 Series diesel engines from Cooper Industries' Energy Services Group are designed and built for electrical power generation and mechanical drive needs. They provide dependable, low-cost power in the 1,000- to 3,500-kw range at continuous rated speeds from 720 to 1,200 rpm.

The four-stroke cycle engines are offered in six- and eight-cylinder in-line, and 12- and 16-cylinder V configurations with BMEP ratings from 242 psi for prime duty to 323 psi for standby service.

The 2400 Series engines are manufactured by Ajax-Superior under license from Mitsubishi Heavy Industries Ltd. of Tokyo, Japan, a world leader in the design and development of industrial diesel engines. Ajax-Superior is part of Cooper Industries' Energy Services Group, known worldwide as a leader in the design and manufacture of heavy-duty power and compression equipment.

CUMMINS

Circle 70 on Reader Service Card

Last year, Cummins Engine Company, Inc., Columbus, Ind., announced an agreement with Hawker-Siddeley and Onan whereby Cummins assumed responsibility for the Onan L Series diesel engines. Under the agreement, which covered only the L Series diesel engines, the engine was designated the Cummins A Series.

The addition of the A Series enabled Cummins to offer diesel power for a wide variety of applications from 41 to 9,000 hp.

The Cummins A Series engine family, which opened up a number of new markets for the company, consists of three, four and six-cylinder naturally aspirated models, as well as a six-cylinder turbocharged model. These engines, which are smaller than the Cummins B Series, offer a wide power range of 41 to 120 hp at 3,600 rpm (compared to the B Series automotive rating of 105 to 186 hp at 2,800 rpm). The A is designed as an in-line, four-stroke, water-cooled engine and employs an indirect injection system. It can be used in generator set, marine auxiliary propulsion and small industrial equipment applications.

Headlining company news during the past year was the installation of Cummins engines aboard the world's largest crewboat, the 160-foot Norman McCall, built by Gulf Craft, Inc., Patterson, La. The vessel is fitted with six Cummins KTA19-M marine diesels, developing a total of 4,080 hp.

The propulsion package was supplied by Cummins Mid-South, New Orleans, La., who also supplied a Cummins Lube Oil blender. This device, designed to eliminate hard-to-dispose-of dirty lube oil, traps impurities from the oil and mixes the clean oil with fuel and returns this mixture to the fuel tanks to be burned.

Other notable Cummins installations include a new 47-passenger excursion boat operating in Hawaii, which was fitted with twin 6BTA5.9-M marine diesels, and a double-ended ferry, which is powered by twin Cummins NTA-855 engines developing 380 hp each at 1,800 rpm, operating in Mobile Bay, Ala.

DETROIT DIESEL

Circle 62 on Reader Service Card

Detroit Diesel Corporation recently introduced three new generation high-speed engines for the passenger boat, pleasure craft and marine market—the 16V-149TI, 6-71TI and 3000 Series.

The 16V-149TI is a 16-cylinder, 149-cubic-inch-per-cylinder engine capable of producing 2,200 bhp at 2,100 rpm.

The 149 engine was first introduced in 1967. Over 15,000 Series 149 engines are in service in generator sets, and marine and other applications.

The engine is designed with a twin-section, wet-linered cylinder block, two-piece overhead camshaft, a unit fuel-injection system, individual cylinder heads, iron crosshead pistons, crankcase access plates, a two-piece crankshaft and quad water-cooled exhaust manifolds and turbochargers.

The new 6-71 is a six-cylinder, 71-cubic-inch-per-cylinder engine available in ratings of 485 bhp at 2,500 rpm and 450 bhp at 2,500 rpm.

Introduced in 1938, the new re-engineered marine 6-71 engine incorporates design input from Detroit Diesel distributors servicing the marine industry. The marinized engine consists of over 80 newly designed components with a total investment of $800,000.

The turbocharged and intercooled engine is designed to be compact, and features a high capacity 24-plate oil cooler, water-cooled exhaust system, a maxi-bypass blower, a new cooling system, crankcase breather collection system, a unit fuel injection system and engine controls, and low-speed performance enhancements.

The 3000 Series marine engine represents the first product offered from the joint collaboration between Detroit Diesel Corporation and Perkins Engine Company, Ltd. The 3000 Series is a pre-production marine engine which will be available in limited quantities beginning this fall.

The 3000 Series is a direct injection, four-cycle, eight-cylinder Vee configuration engine and is rated at 800 bhp at 2,400 rpm. The engine fits into the Detroit Diesel marine engine line-up, thus strengthening DDC's marine engine offering.

Turbocharged and intercooled, the engine has a freshwater heat exchanger, freshwater cooled exhaust manifolds and seawater charge cooling. Oil is freshwater cooled and the engine's filters are "spin-on" for ease of maintenance.

DEUTZ MWM

Circle 63 on Reader Service Card

Deutz MWM—this name comprises not only medium and big engines with powers up to 7,250 kw (9,860 hp) for ship propulsion application, but also compact high-speed engines for fast craft from around 20 to 1,940 kw (27 to 2,638 hp). Accordingly, the company is successfully represented worldwide in the high-speed vessel market.

The following examples of recent commissionings of custom yachts give an idea of what a wide field is covered with Deutz MWM engines in this area.

Last year, the Benetti shipyard (Azimut Group) delivered the 148-foot-long yacht Sea Sedan. Equipped with two Deutz MWM 12-cylinder 604B series engines, she has a cruising speed of some 16 knots. The engines are designed for a maximum power output of 1,460 kw (1,986 hp) at a speed of 1,800 rpm. Board electricity is supplied by two gensets with six-cylinder Deutz MWM 226 series engines.

The latest creation from Codecasa shipyard in Viareggio, the Iliki III, represents one of the yard's

most advanced hull design and engineering system installations. She is equipped with two Deutz MWM eight-cylinder in-line engines of the 816 series with an output of 518 kw (705 hp) each. The 116-foot-long by 23-foot-wide yacht has a cruising speed of 14 knots. Two generator sets with a power of 68 kw are provided to supply board electricity. The generators are driven by six-cylinder Deutz MWM engines of the 226B series.

Also last year, C.R.N., Ancona, delivered the 106-foot-long Vanina to her owners. She is equipped with a twin-engine propulsion plant of Deutz MWM 816 series engines. The two 12-cylinder engines give the yacht a cruising speed of 14 knots. The 12-cylinder 816 engines are designed for a maximum power output of 920 kw (1,250 hp) at a speed of 2,000 rpm.

The range of Deutz MWM passenger boat propulsion engines not only meets requirements of low weight, little installation volume and excellent smooth-running characteristics, but is also highlighted by economy and environmental compatibility. Deutz MWM engines set very high standards for fuel economy, and the low pollutant emission levels, whether in the cold-start, the warm-up or the ship's acceleration phase, are impressive—no smoke puffs that affect pleasure and comfort.

Worldwide product support for Deutz MWM engines is ensured by a great number of service stations and the headquarters-controlled Deutz service.

ELECTRO-MOTIVE

Circle 64 on Reader Service Card

In 1985, Electro-Motive Division of General Motors Corporation introduced the 710 G Series of engines. Since then approximately 680 engines have been delivered for marine, rail, and power generation applications. The larger displacement of the 710 engine is a result of a stroke increase of one-inch over the 10-inch stroke of the 645 Series. The bore size (9-1/16 inches) remained the same for both the 645 and the 710 engines. The engine was developed primarily for improved fuel economy and reliability while providing increased displacement for future rating growth. The 710 G provides up to a 4 percent fuel economy advantage over the latest 645 F model depending upon the engine type and application. The 710 G also produces a 6 percent to 10 percent increase in power rating.

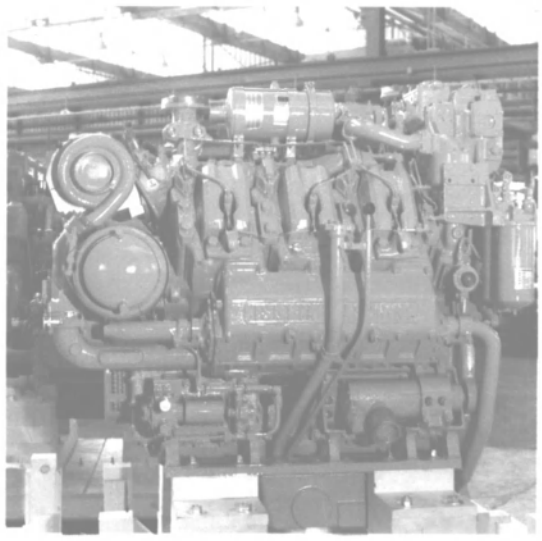
In addition to the increased stroke, the 710 G incorporated significant new hardware. Included in those new components are a high efficiency turbocharger, newly designed fuel injectors, advanced power assembly components, and redesigned valve train components. These new component designs and longer stroke of the engine optimized the air and fuel interaction within the engine providing the improved fuel economy performance. In order to achieve the reliability goals, all of the major components of the 710 G engine were qualified mechanically through the use of finite element analysis during the drawing board phase of the design process. In addition, initial components were subjected to experimental testing of stresses and temperatures to assure conformance to design criteria and to verify analytical results.

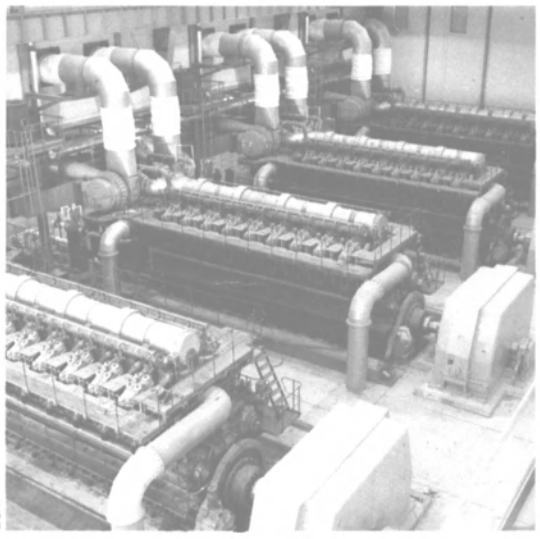
The major emphasis placed on reliability from the very beginning of the design phase can be proven by examining the latest statistics of the 710 G population. In 1988, the 710 G fleet averaged a mean time between failures (MBTF) of 400 days. In 1989, the MBTF has been rising to the 550-day range. The 710 Series represents the most powerful, most efficient and most reliable EMD engine series to date.

(continued)

IRI GROUP

FINCANTIERI IS BUILDER OF DIESEL ENGINES





Fincantieri's Diesel Engines Division, based in Trieste, carries out the functions of a typical industrial enterprise for the production and sale of diesel, gas and dual-fuel engines in the marine, industrial and rail traction sectors.
Following the merging of Isotta Fraschini Motori S.p.A., the Division – with the two trademarks GMT and IF – can avail itself of a range of engines covering power outputs from 200 to 33,000 hp per unit.
In addition, Sulzer slow-speed engines are produced for the Italian market and a cross-licencing agreement exists with Sulzer for medium speed engines of the A 320 and ZA 40 S types.

The two production plants of the Division are located at Trieste (530,000 sq.m.) and at Bari (200,000 sq.m.). The production capability results from more than 70 years of skill, experience and advanced technology.
The highest standards of excellence are maintained by modern quality control, test facilities and precision machining and fabrication.
Furthermore the Division, with its After Sales Service Department, has in place a world-wide network of service centres integrated by flying-squads capable of being readily deployed wherever necessary, both at land-based plants for energy generation and on board ships even during navigation.

FINCANTIERI
Cantieri Navali Italiani S.p.A.

DIESEL ENGINES DIVISION GMT
Bagnoli della Rosandra 334, Trieste/Italy
Tel. (0) 40 7391 Tlx 460274 FINCGM I
Fax (0) 40 827371

Circle 307 on Reader Service Card

(continued)

KRUPP MAK

Circle 65 on Reader Service Card

In recent years, Krupp MaK Motorenbau of West Germany has carried out a great deal of intensive research, design and development work in an effort to provide the best possible product for the changing marine market.

As a result of this effort, Krupp MaK has developed new combustion chamber shapes and injection processes for better trouble-free combustion of heavy fuels.

One of the firm's newest heavy-fuel units is the M453C, which boosts low fuel consumption—a specific fuel consumption of 178 g/kwh, corresponding to 131 g/psh. The M 453 C has a continuous power of 365 kw per cylinder (500 hp per cylinder). The company reports that the engine features an excellent ratio of maximum to mean piston pressure, but a moderate, and therefore operational safe, value. Additionally, the moderate engine load permits a very favorable compression. The engine runs very clean at low loads, partially as the result of high injection energy.

Krupp MaK has reorganized its engine range based on the very successful development of the M 453 C engine. The result is the C Series range. The C Series has a power range from 1,630 hp to 13,460 hp.

The relatively long piston strokes of the MaK engines permit quiet running with high mechanical efficiency. The cylinder air exchange is more effective as with a short stroke engine. The engines are built for a low thermal load, in order to be suitable for heavy fuel oil operation.


World Maritime Journal

:LEETS FIND FIX
TO MARPOL-V NIX

A pioneer manufacturer of marine waste and refuse compactors for nearly two decades has sold hundreds of units to Western shipping fleets to help comply with the recently enacted MARPOL-ANNEX V Regulations.

TFC Corporation, Mpls., MN, reports that many of the major merchant and tanker fleets have ordered multiple units of Pollution Packer Compactors since last Fall.

While many thousands of these compactors have been sold to food service, health care and lodging businesses, the first maritime units were installed in U S Naval and Coast Guard ships in 1974.

Subsequent maritime sales for these compactors include offshore oil rigs and cruise ships. The worldwide popularity of the Pollution Packer line is due, in part, to the ability to Bag, Box, Cube or Bale all types of waste and refuse, wet or dry, into sealable packages.

Recent design advances in the maritime models include a rugged "Heavy Seas" Door Stop and, also, a "Sea Legs" design that permits compactors to be welded or bolted to the ship's deck.

Besides facilitating the [illegible] of plastic wastes at sea, compactors permit the collection and packaging for portside removal. problems of safety are minimized and waiting and storage on port are more complished. The first four models

MARPOL REFUSE DISCHARGE LIMITATIONS All Vessels

Refuse Type	Outside Special Areas	Inside Special Areas
Plastics	Dumping Prohibited	Dumping Prohibited
Floating, Packing, Lining Material	25 miles offshore	Dumping Prohibited
Paper, Rags, Metal, Bottles Crockery	12 miles	Dumping Prohibited
Ground paper, rags, glass, etc.	3 miles	Dumping Prohibited
Food	12 miles	12 miles
Ground Food	3 miles	12 miles

RESTRICTIONS APPLY TO ALL

MARPOL—ANNEX V applies to all watercraft of any type, including tugs, barges, fishing vessels, and recreational and commercial craft both foreign and U.S. flag.

An Advance Notice of Proposed Rulemaking will be published in March, 1988 and a notice of Proposed Rulemaking in July, 1988. After a 60 day comment period, the Final Rule will be published in November, 1988. The rules will be effective on December 31, 1988.

HUNDREDS IN USE!

Jarrah	Hull #610	Master R. Hal Dean	USCG Tahoma
Diane	Hull #611	SS Ultrasea	USCG Esacanaba
Overseas Joyce	Hull #618	SS Rotterdam	USCG Cutter Hull
Garden Green	Overseas Alaska	SS Westerdam	USCG Bear
Vesta	Overseas Arctic	Kittanning	USCG Harriet Lane
Argus Traveler	Overseas Chicago	SS Kenai	USCG Northwind
Northern Lion	Overseas Marilyn	MV Michael Lemos	USS Enterprise
Allegre	Overseas Washington	S/T Charleston	USS Inchon
Northern Light	M/T Venus V	S/T American Heritage	US Navy Indianhead MD
Ravenna	M/T Vesta	M/V Philadelphia	USS Henry B. Wilson
Enterprise	M/V Elaine	M/V Baltimore	USS Pigeon
Esplange	Overseas Harriette	M/V Adonis	The Comfort Tan
A 215660/K6-003	Overseas Joyce	SS Sierra Madre	TA 19 NOAA
Berul	M/T Atlanta	M/V Mobile	The Mercy TAH 19
Western Lion	M/T Lucy	M/V Groton	The Comfort Tahn
Southern Lion	M/T Maryann	S/T Golden Monarch	Norwegian Carribean Cruise Line
Shirley	M/T Suzanne	SS Coast Ranger	Monarch Cruise Lines
Rebecca	M/T Uranus	SS Blue Ridge	"The Volendam," Holland America Cruises
Pluto	M/T Overseas Boston	Science Explorer	"The Veendam," Holland American Cruises
Julie N	S/T Overseas Juneau	S/L Hawaii	The Conception
Eastern Lion	S/T Overseas Natalie	S/L Trader	The Vision
Concordia C	Queen of Bermuda	S/L Navigator	M/V Badak
609	Bermuda Star	S/L Pacific	M/V Dodsland
4837	Vera Cruz	S/L Enterprise	M/V Nilam
Samson S.S.I.T.	USS Puget Sound	USCG Acushnet	M/V Maureen
Atlanta	SS Golden GateM/V	USCG Spencer	M/V Mercedes
igram	Dorado	USCG Tampa	M/V Palacio
la	Chesapeake Trader	USCG Quachita	
	Delaware Trader	USCG Campbell	
#609	Golden Endeavor	USCG Thetis	

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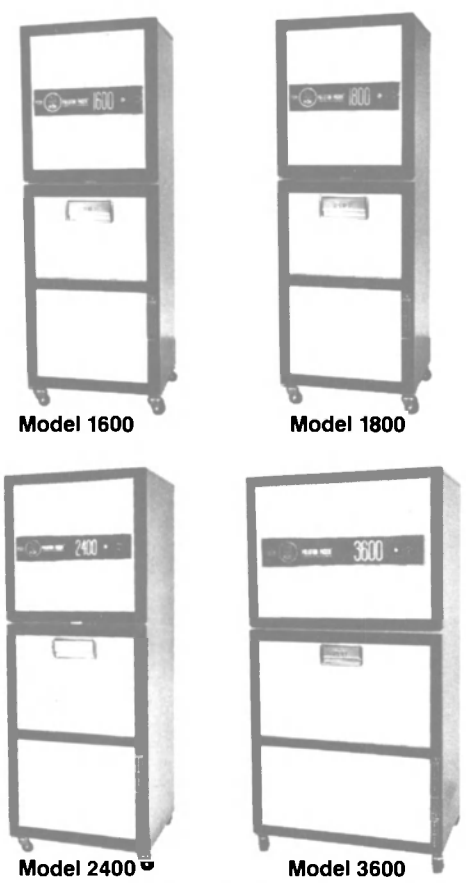

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Model 2400 Model 3600

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MAN B&W DIESEL

Circle 108 on Reader Service Card

MAN B&W Diesel offers an optimally graded four-stroke engine program of state-of-the-art design in the output range between 3,300 kw and 12,000 kw, equipped to meet the propulsion requirements of the 90s. The series is comprised of three MAN B&W medium-speed engines, all modeled on the same design principles.

Beginning with the largest engine, the L58/64, MAN B&W has created an engine series for a class of top-rated engines designed with a view of achieving economy and reliability and equipped with future-orientated, technical and economical design characteristics.

The L58/64 has a piston diameter of 580 mm and a stroke of 640 mm and develops a cylinder output of 1,325 kw at 428 rpm.

The L40/54, with its cylinder output of 665 kw, is modeled on the basic design concept of the L58/64 engine, an engine that has since proved itself in operation in numerous ships' propulsion plants.

The L48/60 engine, which was recently introduced at an international press conference, plugs the output gap between the 40/54 and the 58/64 with its 885-kw per cylinder at a speed of 450 rpm.

All three engines are supplied as in-line configuration engines with between six and nine cylinders.

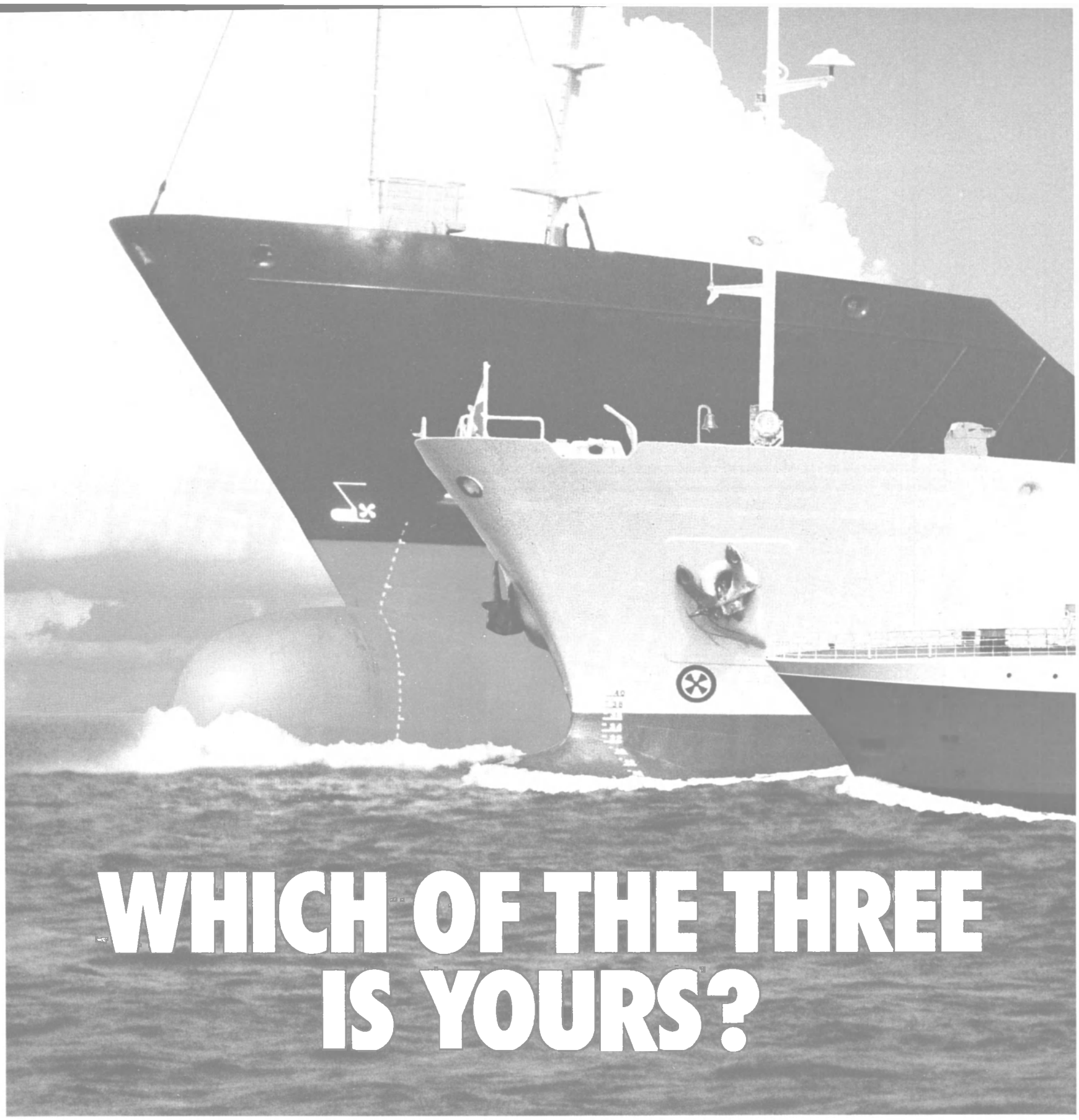
The principle design features of the MAN B&W medium-speed engine generation include:

Rigid monoblock frame casing; underslung crankshaft; individual cylinder jackets, resulting in minimum deformation from gas and mass forces and thermal influences; exhaust valves arranged in cages resulting in simplified maintenance of components.

According to MAN B&W, their new generation of medium-speed engines offer further reductions in fuel consumption rates (85% ECR): L40/54—172 b/kWh, L48/60—169 g/kWh, and L58/64—167 g/kWh; lube oil consumption rates of less than 1 g/kWh; significant reductions in pollutant emission levels; extensive utilization of various engine waste heats, resulting in a high

(continued)

← Circle 292 on Reader Service Card



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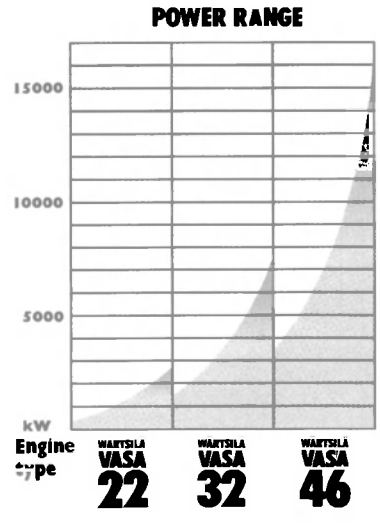

WÄRTSILÄ DIESEL

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Holly Hill Lane - 2nd Floor, Greenwich, Connecticut 06830
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Circle 310 on Reader Service Card

(continued)

aggregate efficiency of the propulsion system; long wear component lifetime; and a simple maintenance concept.

MTU

Circle 66 on Reader Service Card

MTU diesel engines are usually considered in connection with fast naval craft and boats for public authorities, as well as for yachts.

However, what is less well known is that MTU engines are also popular in commercial applications throughout the world.

For example, around 500 engines of Series 331/396, 538 and 1163—as well as Series 652, which is no longer in the sales program—have been delivered to date for the workboat market segment. When all the series that MTU markets are added to these, the number of engines delivered is more than 1,000.

In freighters, pilot launches, fireboats, oil-spill containment craft, dredges and floating cranes, to name just the main types, MTU engines have reached run times of up to 24,000 operating hours—in tugboats, even 30,000 hours. In the fast crew and supply boats of the offshore industry, the compact engines of Series 396 are the preferred power source; here, current run times of 20,000 have been logged.

MTU has long had a strong market position in hydrofoil and catamaran craft for fast passenger and freight service. To date, MTU Friedrichshafen has delivered more than 600 engines for propulsion plants in hydrofoils and catamarans.

Two orders for MTU diesel engines are of particular interest: (1) Five of ten 450-passenger catamarans ordered from a Norwegian shipyard are driven by two MTU 12-cylinder 396 TB63 engines producing a total of 1,960 kw (2,660 hp) at 1,650 rpm; the other five have 16-cylinder 396 TB83 engines with 3,020 kw (4,100 hp) at 1,940 rpm. The first vessels put into service have already accumulated a total of over 30,000 operating hours. (2) MTU contracted to deliver 38 engines—8V 396 TB83—to a Greek ship line for installation in hydrofoil craft to replace the original engines. The continuous-duty power of the two engines together is 1,540 kw (2095 hp) at 1,900 rpm, enabling the 136-passenger hydrofoils to reach a speed of 32 knots.

PEUGEOT ENGINES

Circle 71 on Reader Service Card

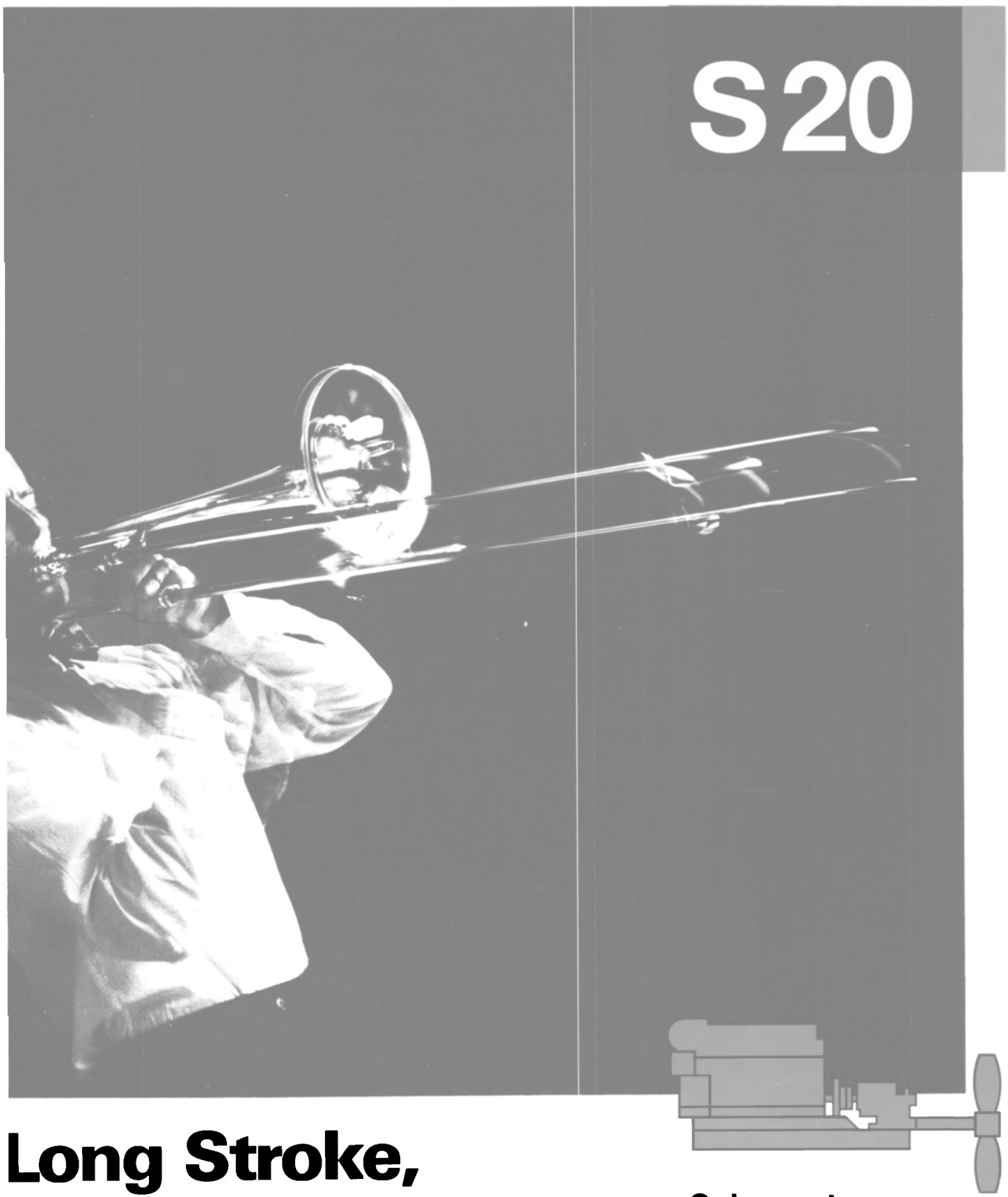
Peugeot Engines & Components of Rutherford, N.J., offers the Peugeot model XD3P diesel engine for both stationary and mobile applications. The engine delivers 76 hp at 4,500 rpm.

Ricardo Comet V combustion chambers in the diesel engines mix air and fuel more effectively for more efficient combustion and maximum power output. Cast iron blocks with integral cylinder liners improve cooling, increase life and facilitate servicing of the XD3P. The compact 2.5-liter engines have excellent power-to-weight ratios. Accessory PTO capabilities are available.

Peugeot now offers six models of liquid-cooled, four-cylinder diesel engines for OEM customers ranging from 50 to 110 hp. Compatible gasoline/LPG fueled engines, ranging from 45 to 160 hp, are also part of the Peugeot OEM line.

Technical data on the Peugeot XD3P engines for power applications in material handling, agricultural and utility vehicles, as well as pump, compressor and generator drives is available.

(continued on page 35)



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SULZER

Circle 319 on Reader Service Card

NAVAL TECHNOLOGY

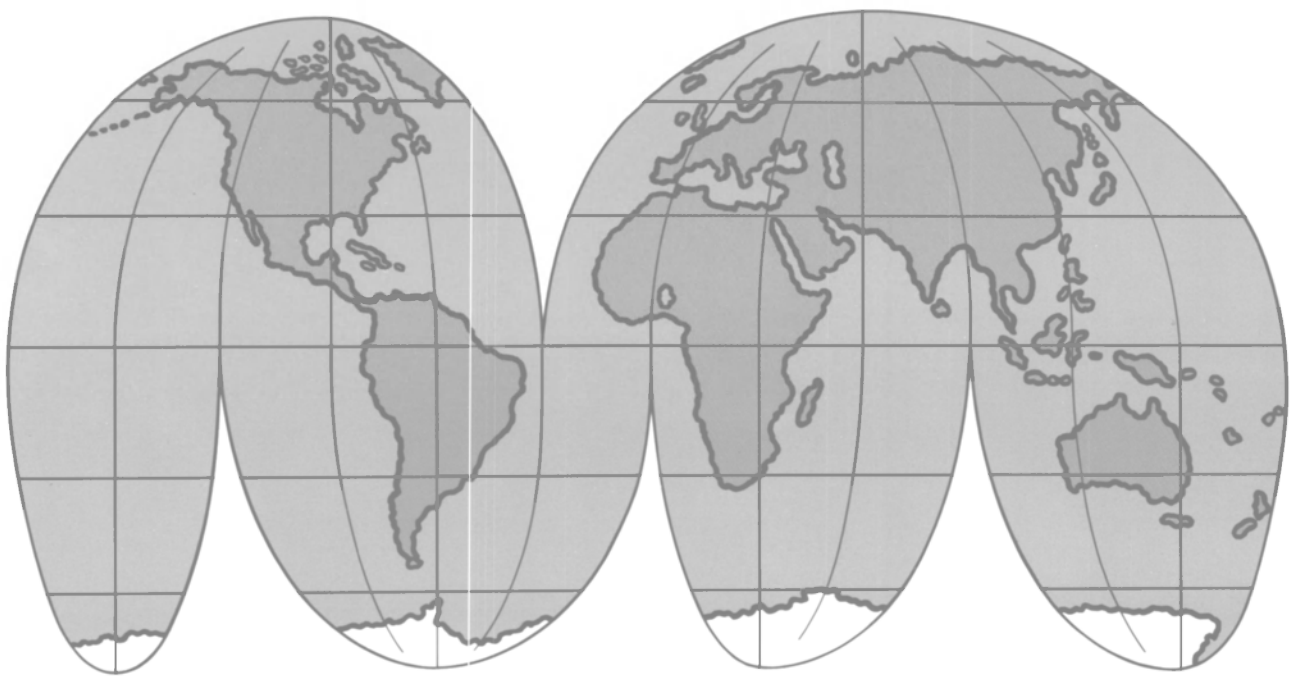
& SHIPBUILDING

a special supplement to

MARITIME REPORTER AND ENGINEERING NEWS

JULY 1989

ALLISON MARINE ENGINES HAVE BEEN PROVEN ONLY IN THE AREAS CAREFULLY MARKED IN BLUE.



Since 1962, Allison engines have been called on for maritime propulsion and to create on-board electrical power in every corner of the globe.

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Allison engines have over 3,000,000 hours of cumulative maritime operating experience and over 100,000,000 hours of aviation and industrial experience. Our engines also have high maintainability plus worldwide support from our extensive parts and service network.

In addition, Allison is General Motors. So, the expertise of the world's largest engineering and manufacturing company is behind each engine.

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Allison

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Circle 311 on Reader Service Card

OUTLOOK FOR THE $35-BILLION ANNUAL NAVY SHIPBUILDING MARKET

Technology Development To Be Given Added Emphasis

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

Navy Shipbuilding Program
Navy ship construction has been the major business driver for shipbuilders and ship systems manufacturers in this country over the past decade. This article deals specifically with Navy ship construction over the next 10 years. As documented in IMA's report, the Navy program is entering a period which will dramatically impact industry.

As shown in Exhibit 1, the U.S. Navy over the past eight years has funded construction or conversion of 175 major ships—an average of 22

(continued)

An Overview:
Current 10-Year
Navy Spending Plans

	Average Annual $ ($ in billions)
*Shipbuilding (inc. equip. installed on new ships)	$10.0
Ship repair/Maint.	5.0
Research/Engineering	9.0
Ship Equip. (other procurement —inc. equip. for modernization)	5.0
Weapons	6.0
Annual total—	**$35 billion**

(Including military construction funds—homeports, cranes, drydocks, etc.—the above total becomes $36 billion-$37 billion annually.)

**Note*—Depending upon ship type, approximately $6 billion-$8 billion of the $10 billion will be used to purchase equipment to be installed aboard new ships.

Exhibit 1—Number of Ships/Conversions Funded
FY 1982-1989

	Fiscal Year								
	1982	1983	1984	1985	1986	1987	1988	1989	Total
Carriers	—	3	—	1	—	—	3	—	7
Submarines	2	3	4	5	5	5	4	4	32
Battleships	1	1	1	—	1	—	—	—	4
Cruisers	3	3	3	3	3	3	5	—	23
Destroyers	—	—	—	1	—	2	—	4	7
Frigates	3	2	1	—	—	—	—	—	6
Tenders	—	—	—	—	—	—	—	—	—
Logistics Ships	3	2	2	3	2	4	3	8	27
Amphibious Ships	1	1	2	2	3	—	2	1	12
Mine Warfare Ships	1	1	4	4	3	—	—	2	15
Patrol Combatants	—	—	—	—	—	—	—	—	—
Survey Ships	4	—	—	4	2	5	—	3	18
Sealift Ships	6	—	5	2	4	2	2	—	21
Misc	—	1	1	—	1	—	—	—	3
Total	24	17	23	25	24	21	19	22	175

Source: Department of the Navy

U.S. NAVY

(continued)

ships per year. As a result, the size of the deployable battle forces has grown from 479 ships in 1980 to 568 ships currently—with 574 ships projected for 1990. Exhibit 2 shows the trend and composition of the deployable battle force over the past decade.

This program has had a major impact on industry. Exhibit 3 shows the shipyards now involved in Navy ship construction or conversion. Exhibit 4 shows the trend in the number of shipyards building or repairing Navy ships over the period 1978-1988.

Will Navy Maintain the Pace of Ship Construction?

The Assistant Secretary of Navy (S & L) last year stated: " ... to keep the size of Navy we are talking about, you would need to build at a continuing pace of 18 to 20 ships a year. ..."

It is useful to compare this projected rate of construction with past activity. The Navy ordered 236 ships in the 1960s—an average of almost 24 ships annually. During the 1970s (a period of declining defense spending), the Navy bought 147 ships—an average of 15 ships annually. In the 1980s, the Navy has thus far ordered 184 ships—an average of 20 ships annually. Will the pace of orders in th 1990s be similar to the 1960s/1980s—or the 1970s?

It is also useful to examine the trend in unit cost. Navy ships in the 1960s cost an average of $24 million each. This figure became $88 million in the 1970s—and $209 million in the 1980s.

No one questions that the ships now being ordered are technologically superior to those ordered in the 1960s. Rather, the question is whether the Navy can continue to maintain a building pace of 18 to 20 per year in light of (1) future funding constraints and (2) continued growth in ship prices.

During the 1980s there was minimal conflict among the proponents of submarine, surface combatant and aircraft carrier programs. There was enough money for growth in all three areas. Things have changed—and difficult trade-offs need to be made. There are not sufficient funds for all of the proposed programs. More clashes over priorities and funds can be expected within the Navy. Submariners, for example, have already been staking their claim to funds by talking up a future role for submarines which infringes on the traditional turf of aircraft carriers.

Technology Development Will Be Given Added Emphasis

The Navy is under pressure to study and introduce new concepts—not simply buy more of the same. Technology-push developments are already getting greater attention in the Navy. Opportunities have opened in a variety of new areas—including fiber optics, composite armor, stealth concepts, ship survivability, etc.

It is important to remember that necessary changes will bring new opportunities and the fact still remains that the Navy plans call for an average of $35 billion annually in expenditures over the next 10 years, approximately a third of which will be spent for ship equipment.

IMA has just completed an in-depth assessment of Navy ship construction over the next ten years. The 220-page report, released in June 1989, evaluates future business drivers and assesses likely construction requirements in nine categories of Navy ships:

- submarines
- surface combatants
- aircraft carriers
- amphibious ships

Exhibit 4—Number of Shipyards Building or Repairing Navy Ships 1978-1988

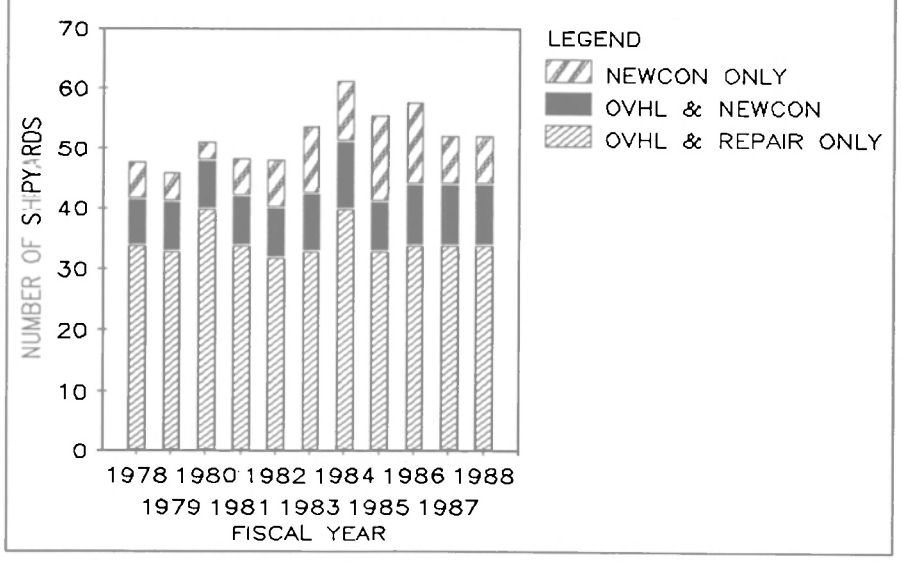


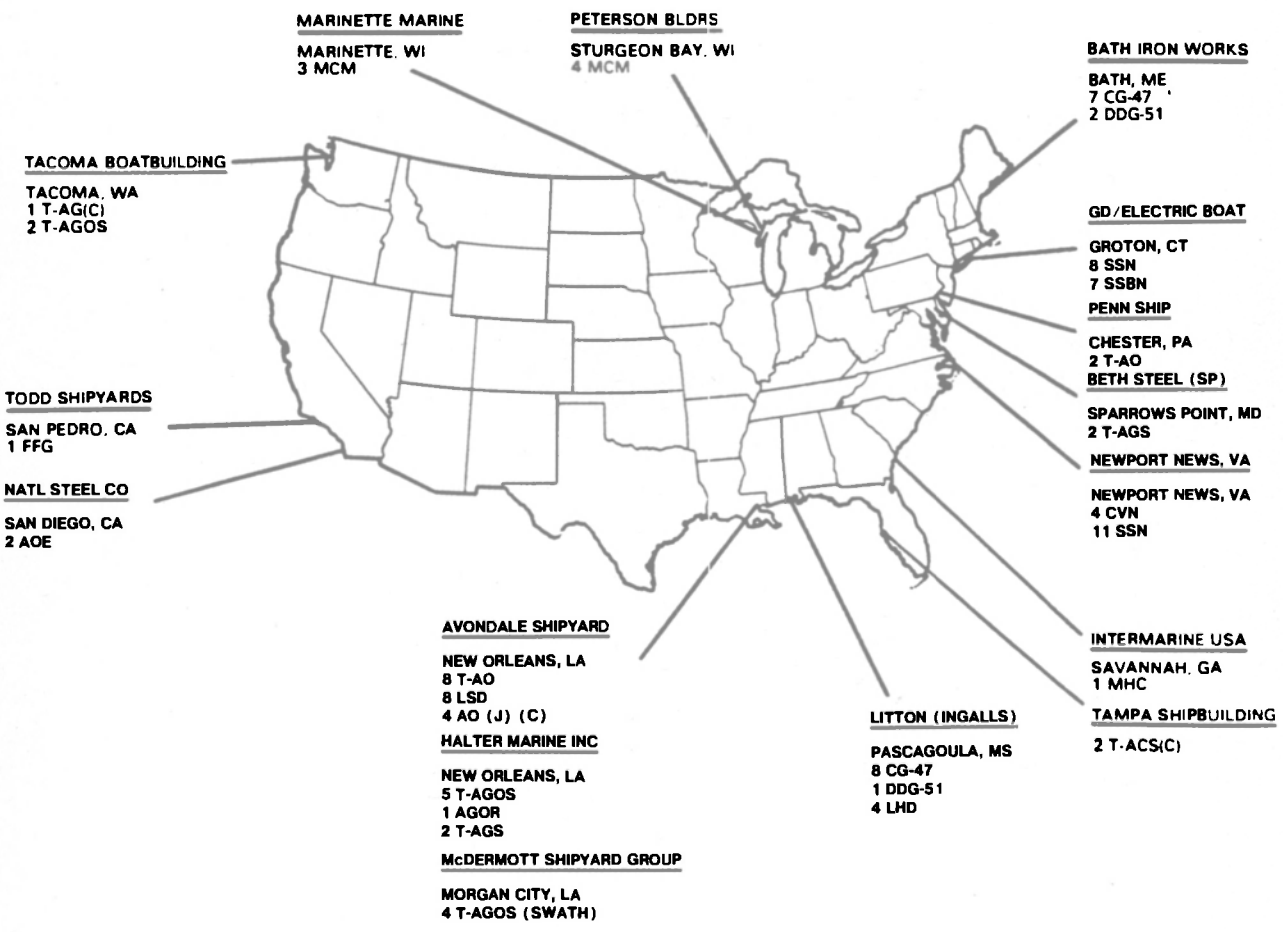
Exhibit 2—Size and Composition of Deployable Battle Forces: 1982-1989

	FY 1980	FY 1988	FY 1989	FY 1990
Ballistic Missile Submarines	40	37	36	35
Deployable Aircraft Carriers	13	14	14	15
Battleships	0	3	4	4
AAW Cruisers/Destroyers	63	75	77	78
ASW Destroyers	44	32	31	31
Frigates	71	107	100	100
Attack Submarines	79	100	100	97
Mine Countermeasures Ships	3	4	3	8
Amphibious Ships (MAF & MAB)	66	63	66	66
Patrol Combatants	3	6	6	6
Combat Logistics Ships	48	58	60	60
Support Ships and Auxiliaries	49	66	71	74
Total	479	565	568	574

Source: Department of Defense

Exhibit 3

PRIVATE SHIPYARDS WITH NAVY CONSTRUCTION PROGRAMS (1 December 1988)



• combat logistics ships
• sealift ships
• mine warfare ships
• ocean survey and surveillance ships
• boats and service craft.

Only a few of the findings and conclusions from the report are highlighted in the above article. More in-depth and extensive coverage is available in the full IMA report, which can be purchased for $950. To order, contact: IMA Associates, Inc., 835 New Hampshire Avenue, N.W., Washington, D.C. 20037; telephone: (202) 333-8501; and telefax: (202) 333-8504.

MAJOR NAVY CONTRACTS

Compiled By Maritime Reporter Staff

March 6

IBM Corporation, Manassas, Va., was awarded a **$9,917,898** modification to a previously awarded cost-plus-fixed-fee contract for systems support for the AN/BSY-1 (V) combat system. Work is expected to be completed by December 31, 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-6130).

March 21

Norfolk Shipbuilding and Drydock Corporation, Norfolk, Va., was awarded a **$5,722,062** firm-fixed-price contract for the regular overhaul of USS Yellowstone (AD-41). Work is expected to be completed in October 1989. The Supervisor of Shipbuilding, Conversion and Repair, Portsmouth, Va., is the contracting activity (N00024-85-H-8195).

March 24

Raytheon Company, Missile Systems Division, Bristol, Tenn., was awarded a **$168,313,663** firm-fixed-price/performance incentive contract for Standard Missile 2 Block IIIs for Terrier and Aegis-equipped ships. Work is expected to be completed by April 1992. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-89-C-5301).

General Dynamics Corporation, Pomona, Calif., was issued a **$5,926,113** delivery order under a basic ordering agreement for repair services to 145 critical items of Close-In Weapons Systems. Work is expected to be completed March 31, 1990. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-89-G-A016).

March 27

Seaward Marine Services Incorporated, Fairfax, Va., was awarded a **$10,895,525** indefinite quantity contract for waterborne ship hull cleaning and associated work. Work is expected to be completed in April 1994. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-89-D-4197).

General Electric Aerospace, Moorestown, N.J., was awarded a **$74,777,300** cost-plus-fixed-fee contract for Aegis installation and test support for DDG-51 class destroyers. Work is expected to be completed in December 1994. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-89-C-5146).

Avondale Industries Incorporated, New Orleans, La., was awarded a **$310,026,350** modification to a previously awarded fixed-price contract for three T-A0 187 class fleet oilers. Work is expected to be completed in February 1992. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-2050).

Ingalls Shipbuilding Corporation, Pascagoula, Miss., was awarded a **$5,534,706** cost-plus-award-fee contract for long lead material for ship alteration kits for DD-963 and FFG-7 class ships. Work is expected to be completed by May 10, 1991. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-89-C-4108).

April 3

General Dynamics Corporation, Electric Boat Division, Groton, Conn., was awarded a **$22,527,869** firm-fixed-price contract with options for the Selected Restricted Availabilities (SRAs) of USS Groton (SSN-694), USS Augusta (SSN-710), and USS Providence (SSN-719). Work is expected to be completed in May 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-89-C-2124).

April 10

ROH Incorporated, Arlington, Va., was awarded a **$11,549,239** cost-plus-award-fee contract for support services for gas turbine surface combatants. Work is expected to be completed in April 1994. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-89-C-6006).

Todd Pacific Shipyards, Seattle Division, Seattle, Wash., was awarded a **$9,321,069** firm-fixed-price contract for a Regular Overhaul (ROH) for USS Kirk (FF-1087). Work is expected to be completed February 23, 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-H-8232).

April 15

Gibbs & Cox Incorporated, New York, N.Y., was awarded a **$5,351,639** modification to a previously awarded cost-plus-fixed-fee contract for baseline design drawings for the PFG II Program. Work will be performed in New York, N.Y. (90 percent); Newport News, Va. (5 percent); and Arlington, Va. (5 percent), and is expected to be completed June 30, 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-2152).

General Dynamics Corporation, Electric Boat Division, Groton, Conn., was awarded a **$5,360,000** cost-plus-fixed-fee contract for valves for CGN-36 and CGN-38 class ships. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-89-C-4137).

General Dynamics Corporation, Electric Boat Division, Groton, Conn., was awarded a **$5,340,000** modification to a previously awarded cost-plus-fixed-fee contract for research and development of advanced components for submarines. Work is expected to be completed in March 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-84-C-5300).

April 17

National Steel & Shipbuilding Company, San Diego, Calif., was awarded a **$5,051,518** firm-fixed-price contract for Selected Restricted Availability for USS Harry W. Hill (DD-986). Work is expected to be

(continued)

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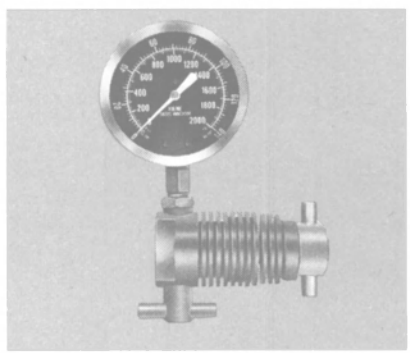

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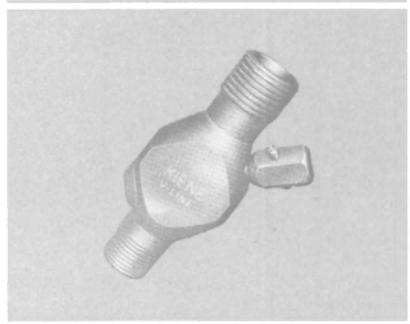

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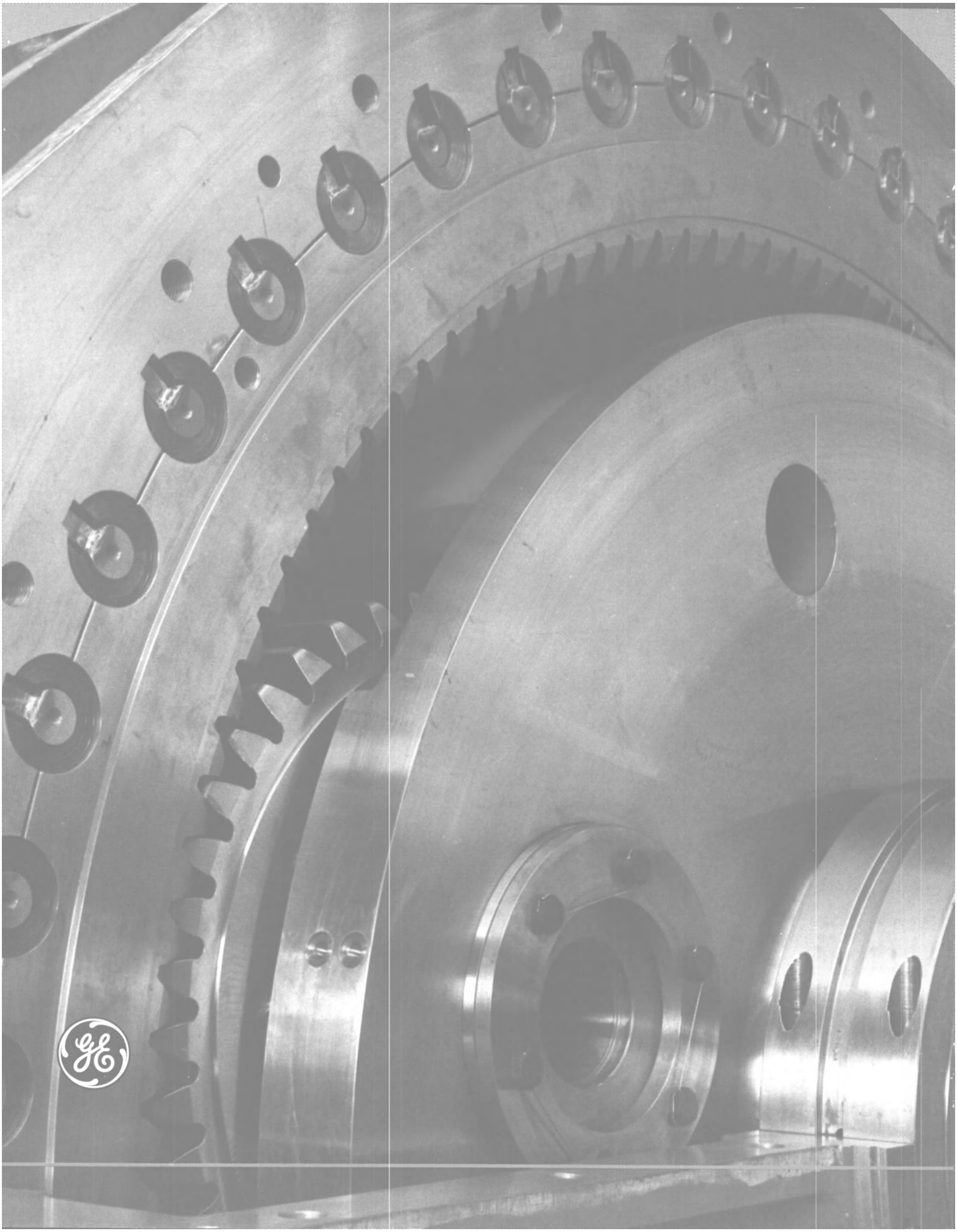

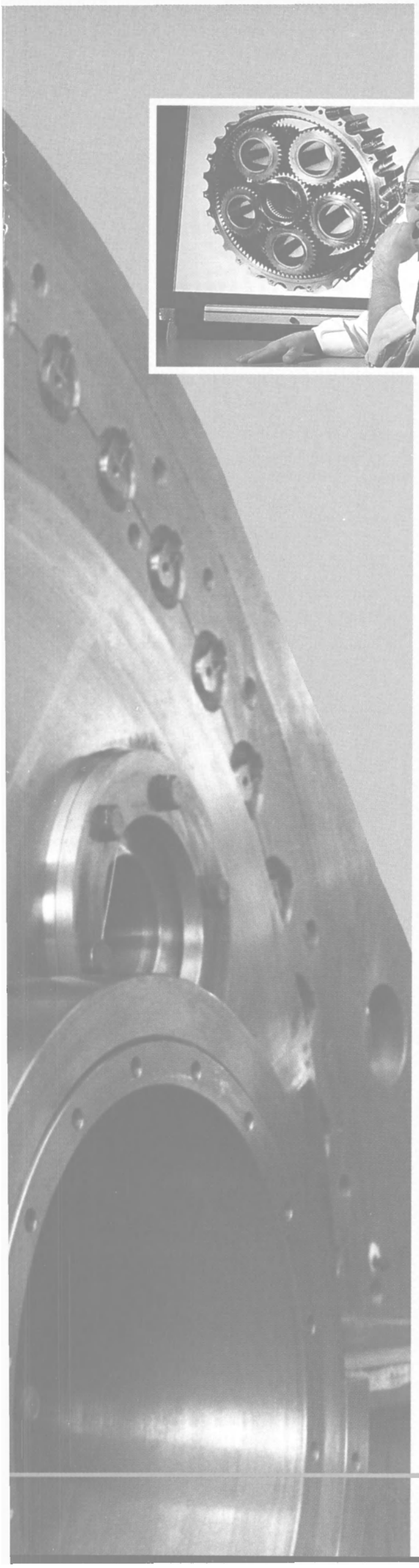

Epicyclic Gears

"GE and RENK join forces to bring this advanced technology to the U.S. Navy."

Gary Mowers
Manager - Gear Engineering
Lynn, Massachusetts

Searching The World

Globalization. Working with other world leaders to develop innovative ideas. "It's nothing new to GE," Gary said. "The Company knows this is the best way to incorporate the latest advances into our products and systems. While GE has designed, manufactured and delivered epicyclic gears to the Navy, we wanted to enhance our technical base. So we entered into a technology transfer agreement with the German gear manufacturer RENK TACKE. Their experience in epicyclic gears encompasses over 800 industrial, marine and naval applications."

"GE will manufacture epicyclic gears in the world's finest gear facility right here in Lynn," Gary explained. "In this way, the Navy will benefit from over 30 years of RENK epicyclic gear experience, as well as over 75 years of GE engineering and manufacturing experience producing propulsion and ships service systems for America's fleet."

Quiet Running

Our objective is to produce quiet, reliable, light weight, high power density epicyclic gears. According to Gary, this goal is within reach. "GE has the newest technology that's right for today's Navy. Now we are combining it with noise and vibration advancements we pioneered for propulsion systems aboard almost every class of ship and submarine in the fleet, including the latest generation of hardened and ground gears for Arleigh Burke destroyers. An important reason we are working with RENK is that their epicyclic gears offer unique noise reduction features."

Clusters Of Technology

While other companies only make gears, GE makes complete propulsion systems. "GE is using systems integration to harness multiple technologies to make the next generation of Navy ships a superior force," Gary continued. "For example, our epicyclic gears will be integrated into the advanced electric drive propulsion system, which we were contracted to develop for the Navy in the coming years. Beyond epicyclic gears, GE is leading the way with Propulsion Derived Ships Service, Intercooled Regenerative Gas Turbines and other advanced technologies."

A Proud Tradition

"The Navy is a valued customer," Gary concluded. "We offer unparalleled expertise in the design, manufacture and test of totally integrated propulsion and ships service power systems. It's the GE difference. The successful application of advanced epicyclic gearing is a mission we share with the Navy. As in the past, we will accomplish this mission."

GE People:

Qualified, Committed, Proud

Circle 310 on Reader Service Card

GE Naval & Drive Turbine Systems

Major Navy Contracts

(continued)

completed August 8, 1989. The Supervisor of Shipbuilding, Conversion and Repair, San Diego, Calif., is the contracting activity (N00024-85-H-8192).

April 21

MAR Ship Operators Incorporated, Rockville, Md., was awarded a **$85,824,550** firm-fixed-price contract plus cost reimbursables for the operation and maintenance of 10 Military Sealift Command oceanographic survey ships. These ships are: USNS Bartlett, USNS Chauvenet, USNS De Steiguer, USNS Harkness, USNS H. H. Hess, USNS Kane, USNS Lynch, USNS Silas Bent, USNS, Wilkes, and USNS Wyman. The Military Sealift Command, Washington, D.C., is the contracting authority (N00033-89-C-4007).

April 24

Hughes Aircraft Company, Fullerton, Calif., was awarded a **$105,308,071** modification to a previously awarded firm-fixed-price contract for AN/UYQ-21 displays for various ships. Work is expected to be completed in August 1991. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5250).

May 2

Atlantic Marine Incorporated, Mobile, Ala., was awarded a **$5,123,055** firm-fixed-price contract for the Selected Restricted Availability of USS Lexington (AVT-16). Work is expected to be completed August 25, 1989. The Supervisor of Shipbuilding, Conversion and Repair, Pascagoula, Miss., is the contracting activity (N00024-89-H-8820).

May 5

Southwest Marine Incorporated, San Diego, Calif., was awarded a **$5,301,757** firm-fixed-price contract for the Drydocking Selected Restricted Availability of USS Reid (FFG-30). Work is expected to be completed September 29, 1989. The Supervisor of Shipbuilding, Conversion and Repair, San Diego, Calif., is the contracting activity (N00024-85-H-8221).

May 9

National Steel and Shipbuilding, San Diego, Calif., was awarded a **$34,384,494** firm-fixed-price contract for the New Threat Upgrade (NTU) Regular Overhaul of USS Fox (CG-33). Work is expected to be completed September 12, 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-H-8192).

Todd Pacific Shipyards Corporation, Seattle Division, Seattle, Wash., was awarded a **$26,738,698** firm-fixed-price with performance fee contract for Regular Overhaul of USS Chandler (DDG-996). Work is expected to be completed August 31, 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-H-8232).

Long Beach Naval Shipyard, Long Beach Calif., was awarded a **$25,276,689** firm-fixed-price with performance contract for Regular Overhaul of USS Callaghan (DDG-994). Work is expected to be completed September 21, 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

May 10

Loral Defense Systems. Akron, Ohio, was awarded a **$10,500,000** firm-fixed-price contract for 10 associative processors for MK2 combat control systems. Work is expected to be completed in August 1991. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-89-C-6136).

Martin Marietta Aero & Naval Systems. Baltimore, Md., was awarded a **$14,353,181** firm-fixed-price modification to a previously awarded contract for a MK-41 vertical launching system for DDG-2313, a Japanese Maritime Self-Defense Force ship. Work is expected to be completed January 30, 1993. The Naval Sea Systems Command, Washington, D.C , is the contracting activity (N00024-87-C-5919).

FMC Corporation. Minneapolis, Minn., was awarded a **$10,635,390** firm-fixed-price modification to a previously awarded contract for a MK-41 vertical launching system for DDG-2313, a Japanese Maritime Self-Defense Force ship. Work is expected to be completed January 30, 1993. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-5930).

PROPOSALS/BIDS

The *Commerce Business Daily* lists notices of proposed government procurement actions, contract awards, sales of government property, and other procurement information. The following is a brief listing of some of the proposed government contracts available.

PROPOSALS DUE JULY 27 for **drydocking and repair of USCGC Pt. Franklin (WPB-82350)**. Sol. DTCG80-B-00137. Provide all labor, material and equipment necessary to perform routine drydock vessel maintenance. Vessel availability scheduled for on or about October 31, 1989. The place of performance will be the contractor's facility. The proposed contract listed here is part of the Small Business Competitiveness

LOOK AT WHAT MARINE INDU VALUABLE REFE

THE 1989 MARI A WORLDWIDE IN

The Most Comprehensive Listing of Vessel Owners and Operators

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Demonstration Program.

Drydocking and repair of USCGC White Lupine (WLM-546). Sol. DTCG80-89-B-00140. *BIDS DUE JULY 25.* Provide all labor, material and equipment necessary to perform routine drydocking vessel maintenance on 133-foot vessel. The vessel will be available on or about August 14, 1989. The work will be performed at the contractor's facility. Nonrefundable charge for requested drawings or technical publications. Proposed contract is part of the Small Business Competitiveness Demonstration Program.

For both of these proposals contact: Ms. Beda Gonzalez, contract specialist (212) 668-6253; USCG Maintenance & Logistics Command Atlantic, Bldg 400, Section M, Room 207, Governors Island, NY 10004-5085.

PROPOSALS DUE JULY 28 for **drydocking and repair of USCGC Point Bonita (WPB-82347)**. Sol DTCG80-89-B-00126. Furnish all necessary labor, material, equipment and services to drydock and repair. Vessel will be available on or about August 28, 1989. The solicitation (IFB) anticipated to be issued on or about June 28, 1989. Funds are not presently available for this procurement. The government's obligation under this solicitation is contingent upon the availability of appropriated funds from which payment for contract purposes can be made. Nonrefundable fee for drawings and technical publications. This acquisition is open to small and large businesses under the Small Business Competitiveness Demonstration Program. Contact: Ms. Joyce Sheppard, contract specialist (212) 668-6475. USCG Maintenance & Logistics Command Atlantic, Bldg 400, Section M, Room 207, Governors Island, NY 10004-5085.

BIDS OPEN JULY 24 for **dryberthing hull repairs of LCM-8 (576 & 653) RAV**. Sol. N62791-89-B-0122. Work to be performed at contractor's facility. Contract dates August 7 through September 29, 1989. All coast guide area sources who currently hold, or are qualified for and willing to enter into a master agreement for repair and alteration of vessels (DFARS 17.71) prior to award, may submit a bid which shall be considered. Contact: Terri L. Kniepp (619) 556-2310, Supervisor of Shipbuilding, Conversion and Repair, Naval Station, Box 119, San Diego, CA 92136-5119.

PROPOSALS DUE JULY 21 for **drydocking phase maintenance, fixed-price on USS Charleston (LKA-113).** Sol. N62678-89-R-0201. Miscellaneous mechanical, electrical/electronic, structural repair, gas freeing drydocking, and hull preservation. To qualify for the award of a Job Order resulting from this solicitation, the offeror must execute a current NAVSEA Master Ship Repair Agreement. Ship characteristics: overall length: 575-1/2 feet and light displacement: 10,413 long tons. The ship will be available for inspection on July 7 through July 12 at the U.S. Naval Base, Norfolk, Va. Availability dates are September 11, 1989 to January 11, 1990. The work will be accomplished at the contractor's facility. The geographical area of this solicitation is restricted to the homeport area. Contact: P. Fields, (804) 396-7664, Supervisor of Shipbuilding, Conversion, and Repair, P.O. Box 215, Portsmouth, VA 23705-0215.

PROPOSALS DUE JULY 24 for **drydock and repair of USCGC Key Largo and USCGC Metompkin**. Sol. DTCG80-89-B-00151. Provide labor, material and equipment necessary to perform routine drydock vessel maintenance. Work will include routine drydocking, propeller, fin stabilizer and rudder inspection, welding repair, etc. The availability schedule for the USCGC Key Largo, based in Tybee, Ga., is September 12, 1989. The USCGC Metompkin will be available November 13, 1989. She is homeported in Charleston, S.C. Charge for requested drawings and publications. The proposed contract is part of the Small Business Competitiveness Demonstration Program. Contact: Mrs. P. Cutts, contract specialist at (212) 668-6279, office of Commander, USCG Maintenance & Logistics Command Atlantic (vpl), Bldg 400, Section M, Room 207, Governors Island, NY 10004-5085. Contracting officer: Ms. V.A. Nemara, (212) 668-3455, same location.

PROPOSALS DUE AUGUST 9 for **drydock and (dockside) repair of USCGC Cherokee (WMEC-165).** Sol. DTCG80-89-B-00154. Provide labor, material, and equipment necessary to perform routine dockside vessel maintenance. Work will include overhauling anchor windlass and motor, axial vent blowers, sewage pump motors and davit, temporary logistics, welding repairs, etc. Dockside repair of USCGC Cherokee in Little Creek, Norfolk, Va. Vessel availability is September 11 to October 27, 1989. Charge for requested drawings and technical publications. The proposed contract is part of the Small Business Competitiveness Demonstration Program. Contact: Ms. Karen Slivonik, contract specialist (212) 668-3374, office of Commander, USCG Maintenance & Logistics Command Atlantic (vpl), Bldg 400, Section M, Room 207, Governors Island, New York, NY 10004-5085. Contracting officer: Ms. V.A. Nemara, (212) 668-3455, same location.

PROPOSALS DUE AUGUST 9 for **dockside repairs to USCGC Barque Eagle (WIX-327).** Sol. DTCG80-89-B-00155. Furnish necessary labor, material, equipment and services to perform dockside repairs. Work will include renewal of deck plating, joiner doors, portable water piping, fin tube heat coils, and riveted fuel oil tank seam, temporary logistics, recaulk weather deck, etc.

(continued)

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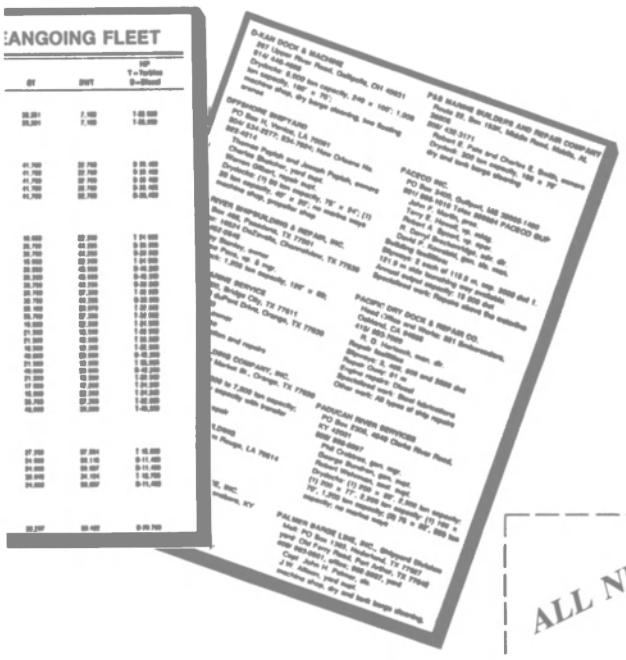

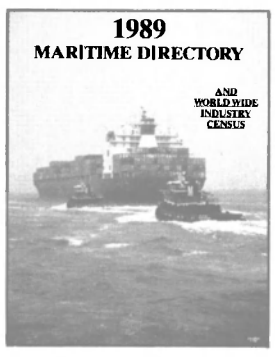

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Proposals/Bids

(continued)

Repair to be performed at New London, Conn., vessel's homeport. The vessel will be available on or about September 18, 1989. This is open to small and large businesses under the Small Business Competitiveness Demonstration Program. Contact: Joyce M. Sheppard, contract specialist (212) 668-6475, office of Commander, USCG Maintenance & Logistics Command Atlantic (vpl) Bldge 400, Section M, Room 207, Governors Island, NY 10004-5085. Contracting officer: Vanessa A. Nemara, (212) 668-3455, same location.

PROPOSALS DUE AUGUST 2 for **drydock and repair of USCGC Vise (WMLIC-75305).** Sol. DTCG80-89-B-00156. Provide all labor and material for routine drydocking and repairs. Work will include inspection of propeller, shafting and barge crane, renewal of sewage piping, overhead insulation and spud wells, welding repairs, painting, repair of reduction gears, etc. The vessel's homeport is St. Petersburg, Fla. This solicitation is being issued pursuant to the Small Business Competitiveness Demonstration Program. Contact: Sandra A. Santana, contract specialist (212) 668-3378, office of Commander, USCG Maintenance & Logistics Command Atlantic (vpl), Bldg 400, Section M, Room 207, Governors Island, NY 10004-5085.

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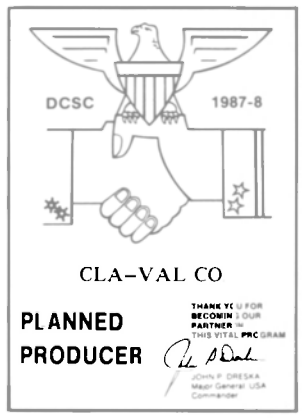

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Circle 306 on Reader Service Card

NASSCO Awarded $34.4-Million Contract For Cruiser Overhaul

National Steel & Shipbuilding Co. (NASSCO) of San Diego, Calif., was recently awarded a $34.4-million U.S. Navy contract for the New Threat Upgrade Regular Overhaul of the cruiser USS Fox (CG-33). The Naval Sea Systems Command, Washington, D.C., was the contracting activity (N00024-85-H-8192).

Namco Controls Introduces Line Of Limit Switches For Navy And Marine Use

Namco Controls recently announced that it has a line of limit switches suited for Navy and Marine use.

According to the firm, Namco Snap-Lock® limit switches are particularly well-suited for use in harsh marine environments. The switches meet MIL-C-2212, have an operating range of -40 degrees C-150 degrees C, and are nuclear qualified, including radiation.

Additionally, the switches are noncorroding and use rust resistant materials throughout, are submersible and watertight and require no special protection for RFI/EMI environments.

A free Navy/Marine Switch Selector catalog is available. For your copy,

Circle 89 on Reader Service Card

Long Beach Naval Yard Receives $25.3 Million For Destroyer Overhaul

Long Beach Naval Shipyard, Long Beach, Calif., recently received a $25.3-million contract for the regular overhaul of the destroyer USS Callaghan (DDG-994).

Wyle Contract Marks 25 Years Of Support To Naval Weapons Center

The Scientific Services & Systems Group of Wyle Laboratories, El Segundo, Calif., has been awarded a three-year environmental testing contract by the Naval Weapons Center at China Lake, Calif. This contract, valued at approximately $1 million, marks the latest award during the 25 years that Wyle has supported the Naval Weapons Center.

Wyle Laboratories is one of the nation's leading marketers of high-technology electronic components and computer systems. The company is also a major supplier of research, engineering and testing services to the aerospace, defense and energy industries.

For more information and free literature,

Circle 107 on Reader Service Card

Mechanical limit switches are still preferable to electronic proximity switches in most Navy applications. Here, a Namco Snap-Lock® switch controls a davit gearbox. Rugged Snap-Lock switches have reliably stood up to harsh environments like this for years.

"Are Limit Switches Too 'Old Fashioned' For Today's Navy?"

Not By a Long Shot.

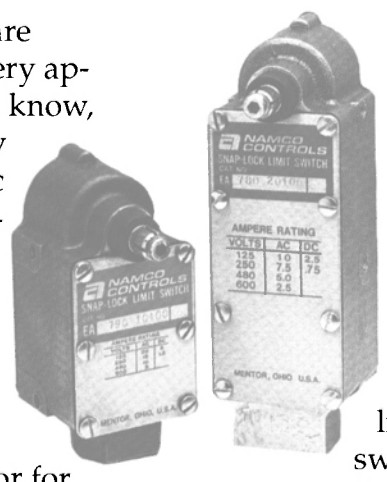
Here's Why...

Electronic sensors are great...but not for every application. We should know, since we make nearly all kinds of electronic and electro-mechanical switches, including proximity, photoelectric, fiber optic and laser sensors.

We also make limit switches, which, in our mind, are superior for Navy and marine tasks.

Why Limit Switches?

Most importantly, our limit switches are proven rugged and reliable. Right now, we've got thousands on the seas. All are made by Namco, the only supplier of nuclear qualified limit switches to the U.S. nuclear industry and Navy.



Additionally, our switches meet MIL-C-2212...just try to find a proximity switch that can.

Finally, our limit switches are "seaman-friendly." By that we mean repairable at sea, if necessary. Unfortunately, electronic switches cannot be fixed...just discarded.

All in all, knowing what mechanical and electronic switches can and can't do, we recommend mechanical limit switches for most Navy and marine uses. Call us, we'll be happy to show you more!

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- Self-cleaning sliding contact or butt contact versions
- Submersible and watertight
- No special protection needed for RFI/EMI environments
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Call or write for our Navy/Marine Switch Selector catalog.

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Circle 30 on Reader Service Card

3. MAJ

the date for diesel engines – all year round

...builds slow speed crosshead engines under Sulzer licence for ship propulsion and stationary service. The production programme of 3.MAJ is identical with that of Sulzer Brothers Ltd., Winterthur and it includes engine types: RNF-M and RTA SUPER LONGSTROKE, of the power range from 1480 kW to 45840 kW.

...builds S.E.M.T.-Pielstick medium speed engines under S.E.M.T. licence for ship propulsion and stationary service, Jadranbrod being the licencee. This production programme of 3.MAJ is identical with that of S.E.M.T., Paris and it includes engine types: PC2-5, PC2-6, PC20, PC30 and PC40 covering the power range from 2365 kW to 21870 kW.

...provides services for maintenance, repair and supervision of the following: Sulzer slow speed engines S.E.M.T.-Pielstick medium speed engines, MaK engines, Turbochargers – Sulzer and BBC type, Woodward governors, Engine remote controls of Sulzer type, Fuel injection devices on all types of main and auxiliary engines.

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3. MAJ ALL YEAR ROUND

Circle 323 on Reader Service Card

(continued)

STEWART & STEVENSON

Circle 72 on Reader Service Card

Stewart & Stevenson Services, Inc., with branches in Harvey, La., and Houston, Texas, is one of the world's largest distributors of diesel engines with Detroit Diesel and General Motors-EMD engines from 50 to 4,300 hp.

With a normal inventory of hundreds of diesel engines and generators, a staff of experienced mechanical, electrical, and marine engineers, along with 24-hour worldwide parts and service, Stewart & Stevenson offers an excellent support network to its customers.

Full service branches, two remanufacturing plants, and over 200 dealers are ready to provide full service to customers, from financing a vessel to training and technical support.

Stewart & Stevenson can provide custom engineered power systems for all marine applications.

SULZER

Circle 73 on Reader Service Card

The new 354-foot Swedish icebreaker Oden features Sulzer diesel engines for both her propulsion and auxiliary duties. She is propelled by four Sulzer eight-cylinder ZA40S medium-speed diesel engines with a total power output of 18,000 kw (24,500 hp) at 510 rpm. In addition, the ship's electrical requirements are met by four Sulzer 6AT25H auxiliary diesel engines, each of 1,270 kw (1,730 bhp) output at 1,000 rpm. Both main and auxiliary engines were built under license in Poland.

The diesel-mechanical machinery arrangement of the 13,000-ton Oden represents the latest state-of-the-art technology in icebreaker design. The 8ZA40S main engines drive twin CP propellers through gearing and thereby end a diesel-electrical tradition in Baltic icebreakers that has lasted over 50 years. The change came principally because of machinery cost and fuel consumption but was also supported by past success with diesel-mechanical machinery in other icebreakers in other countries. In addition, the Oden reinforces Sulzer's leading position in the icebreaker market. Some 299 Sulzer medium-speed diesel engines totaling about 1,026 MW (1.4 million bhp) have been installed in, or ordered for, 116 icebreaking vessels.

In other company news, Sulzer marked its first Sulzer S20 marine propulsion system installation when Pesquera Loa Norte SA of Chile ordered seven of the units for re-engining of seven fishing vessels. Each propulsion system includes a six-cylinder S20 diesel engine, Reintjes gearbox, fixed-pitch propeller, PTO gearbox, controls and all other necessary ancillary equipment. The Sulzer 6S20 diesel engines develop 870 kw (1,185 bhp) each at 1,000 rpm.

The re-engining of the vessels will provide them with higher speed capability.

With cylinder dimensions of 200-mm bore and 300-mm stroke, the S20 range of six-, eight- and nine-cylinder engines offers power outputs between 570 and 1,350 kw at speeds of 720-1,000 rpm. Using technology proven in Sulzer's large four-stroke engine types, the S20 has benefits of: (1) full heavy-fuel operation (700 cSt) and increased performance with marine diesel oil; (2) clean combustion, even at part load, without a need to use a charge air heating system in low-load operation; and (3) designed for high reliability and durability with two-year overhaul intervals.

SWDIESEL

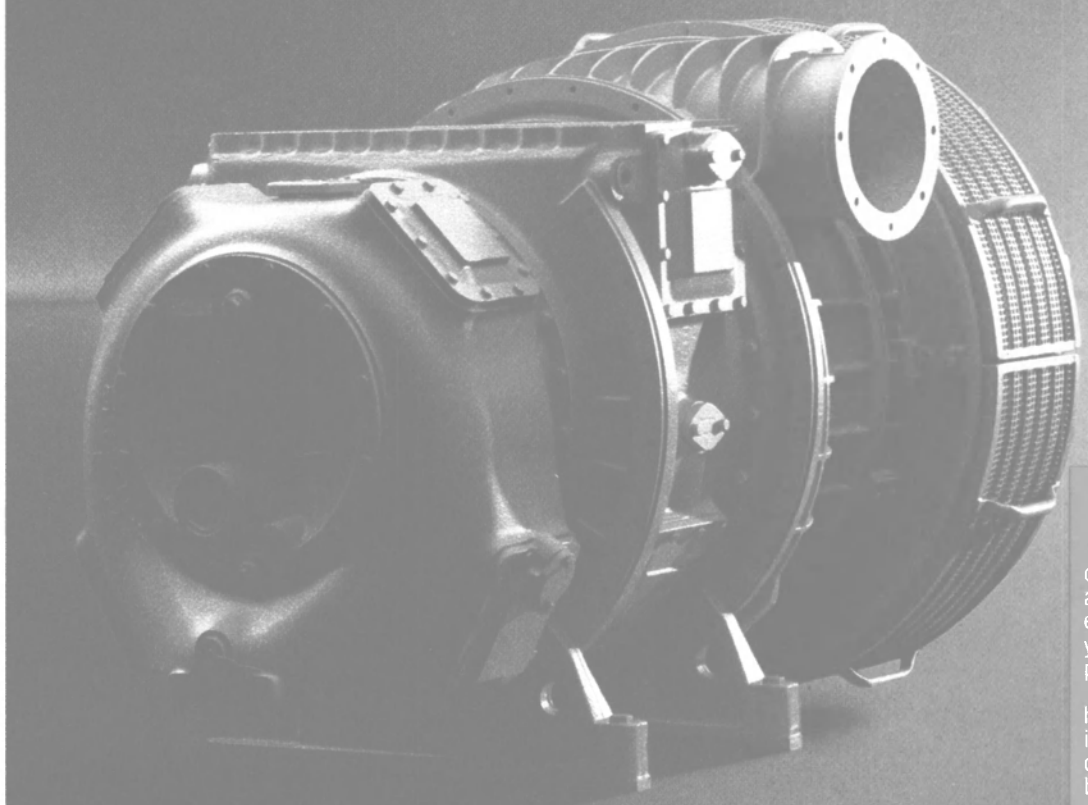
Circle 67 on Reader Service Card

Since it was first introduced in 1982, over 150 SW280 diesel engines

(continued)

Circle 126 on Reader Service Card ➔

Asea Brown Boveri service has the speed and skill to keep the ball in the air.



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in the 6-8-9 in-line and 12- and 16-cylinder V configuration have been installed in various ship types and shore installations. The basic design of the SW280 enables it to be operated on both heavy and light fuel oils and several SWDiesel engines have been supplied for installations which are capable of running on fuels with a viscosity of max. 700 cSt.

Over 50 ships with SW280 engines have entered service in the fishing industry, where, besides a considerable number in the Netherlands fleet, the engine has been installed in vessels from Spain, Iceland, Scotland, and even in a factory trawler, the Arctic Storm, fishing near Alaska. The Arctic Storm features a 16-cylinder SW280 main propulsion engine and a 6SW280 auxiliary engine. As an auxiliary unit, the SW280 engine has been fitted aboard containerships, supply and dredging vessels and ferries.

Over 1,250 cylinders with an aggregate output of over 380,000 kw have shown that the SW280 diesel engine has gained wide acceptance in the marine market.

Based upon decades of experience, Dutch engine manufacturer SWDiesel has developed a large variety of medium-speed engines ranging in power from 400 kw (536 hp) to 13,000 kw (17,433 hp).

Comprehensive research, sophisticated calculating methods, and the latest tools and equipment have enabled SWDiesel to manufacture a well-balanced and modern diesel engine range—powerful, fuel-efficient and highly reliable.

VOLVO PENTA

Circle 68 on Reader Service Card

A total of twelve units of the newest and largest engine design of AB Volvo Penta of Gothenburg, Sweden, were recently installed aboard two inland waterway forestry products shuttles operating in Europe.

The six diesel engines fitted on each of the 287-foot shuttles are of Volvo Penta's new TAMD 162 design, each rated at 346 kw at 1,800 rpm, and connected to Stamford generators. Power is supplied to a switchboard and from there to two KaMeWa CP propeller thrusters, also of new design, via ABB 1,000-kw electric motors.

The diesel-electric system driving thrusters has been adopted to provide the vessels with increased cargo volume, while at the same time providing a simple installation, increased safety and reduced manning.

The engines are 16-liter units of Volvo Penta's in-line six-cylinder format with four valves per cylinder, turbocharging and aftercooling. The TAMD 162 was introduced in the second half of last year, and is the largest diesel produced by Volvo Penta.

Volvo Penta reports the advanced engine design incorporates a number of new features that combine to give low maintenance requirements and long operational life while still achieving increased engine performance and higher efficiency and safety.

Besides the shuttles' main propulsion units, Volvo Penta also supplied the vessels' emergency generator sets—in each case a TAMD 71A unit of 135 kw, connected to a Stamford generator rated at 85 kw at 1,800 rpm.

WARTSILA DIESEL

Circle 74 on Reader Service Card

Wartsila Diesel of Finland has introduced the Wartsila Vasa 46, an innovative medium-speed, four-stroke heavy fuel engine designed for maximum operational reliability. The most significant design features of the Vasa 46 are the thick-pad technology for reduced bearing loads, the new SwirlEx charging system for high efficiency at all loads and speeds and Twin Injection, the double injection system for a high rate of combustion and low fuel consumption. The output range of the engine is 3,600-16,300 kw (4,828-21,858 hp) at a speed range of 450-514 rpm.

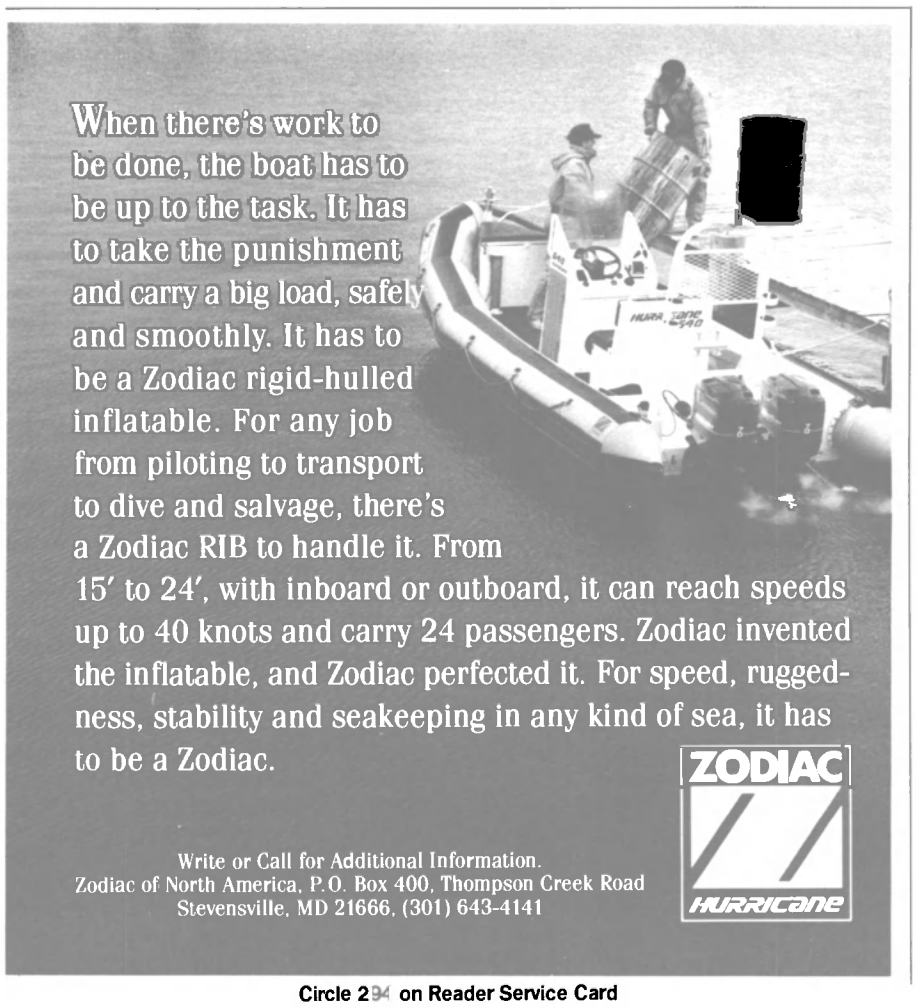
The first Vasa 46 installation was aboard a multipurpose RO/RO vessel built at the J.J. Sietas Shipyard in Hamburg. The vessel is fitted with a six-cylinder Vasa 46 as her main engine.

The new Birka Line AB 1,700-passenger, 32,000-grt luxury cruiser, now under construction at Wartsila Marine's shipyard in Turku, Finland, will have a propulsion plant consisting of four six-cylinder Vasa 46 engines. The total output of the main machinery is 21,100 kw at 500 rpm.

The cruiser will also be fitted with Vasa type auxiliary engines. Electricity onboard will be generated by four six-cylinder Wartsila Vasa 32 engines with a total output of 9,800 kw at 750 rpm.

Both the main and auxiliary engines will be elastically mounted. The main engines drive two CP propellers through reduction gears. The engines will be delivered to the shipyard at the end of 1989.

Another recent introduction from Wartsila is the Wartsila Vasa 22/26, a powerful medium-speed auxiliary engine. This engine is well-suited for power production in different types of vessels. Rigid design of the components combined with an optimized combustion process guarantees reliable and economical operation at all loads, even on the lowest grade heavy fuels. The Vasa 22/26 has a cylinder bore of 220 mm and a piston stroke of 260 mm. The output range is 54—3,000 kw at speeds ranging from 720 to 1,100 rpm.



Circle 294 on Reader Service Card

MARINE LUBRICANTS

MEETING THE DEMANDS OF NEW AND UPGRADED DIESELS

The trend toward upgrading output and efficiency of marine diesel engines, as well as improving their ability to burn heavy residual fuels with high sulfur content, has placed increasing demands on the petroleum industry to improve their products. The oil producers have responded by offering new and reformulated marine lubricants, including highly alkaline cylinder oils to protect against the acidity resulting from the burning of residual fuels, and improved system oils to meet the severe-service demands of the latest engines.

The following review is based on data supplied by the major producers of marine lubricants. Free brochures and data sheets giving full details on the formulations and capabilities of these oils are available from all of the producers included in this review. To obtain copies, just circle the appropriate Reader Service Number(s) on the postage-paid card in the back of this issue.

CASTROL MARINE

Circle 101 on Reader Service Card

Castrol Marine has always been a leader and innovator in the lubricant market by supplying quality products and service to meet changing customer needs. Castrol Marine became one of the first major lubricant manufacturers to offer the next generation crosshead cylinder oil, when it introduced Castrol Cyltech 80 to the marine market. Full information on the performance advantages and overall cost savings of Castrol Cyltech 80 is detailed in a brochure, which is available upon request.

In addition to Cyltech 80, Castrol has recently introduced other products to meet customer needs, such as the Castrol MLC series and Castrol CDX. The firm's approach is to offer specialized products for specific applications, which take into account vessel trade patterns, fuel quality and other variables.

Regarding service facilities, Castrol Marine has true bulk availability at all major world ports. In the U.S., Castrol has manufacturing facilities in New Jersey, Louisiana, and California, and has bulk inventory in nine other locations.

Because of its experience and trained personnel, Castrol can offer extra service whenever needed.

CHEVRON

Circle 40 on Reader Service Card

Chevron has recently introduced Chevron DELO Marine Oil 477 for the inland marine trade class. It is marketed as Chevron DELO 6170 Oil for customers on the western and eastern seaboard.

Chevron's DELO Marine Oil 477 (DELO 6170 Oil) is test proven, demonstrating superior results in the field for today's new generation high-performance diesel engines. This product is designed especially for use in engines for towboat service where some current lubricants may have limited performance and is compounded to a high alkalinity level, measuring 17 TBN (Total Base Number) by ASTM Method D-2896.

New engine designs require improved oxidation and viscosity control for operating demands of fuel efficient engines with higher combustion pressures and temperatures. Increased alkalinity reserve is required for corrosive wear protection and especially for operations requiring extended drain intervals.

DELO Marine Oil 477 (DELO 6170 Oil) was field tested in marine and locomotive service in GE and EMD engines with full approval from these engine manufacturers. Field testing demonstrated increased oxidation and viscosity control compared to typical Generation 4 lubricants. This increased oil control can allow increased drain intervals for GE engines and due to increased drain intervals, the added alkalinity reserve also provides the ability to extend drain intervals. This superior oxidation stability and viscosity control was also demonstrated in EMD engines modified to run at higher operating temperatures to increase efficiency.

Chevron DELO Marine Oil 477 (DELO 6170 Oil) provides an optimized engine oil formulation for today's service requirements for industrial engine design in marine towboat and ferry service.

EXXON

Circle 103 on Reader Service Card

Diesel lubricants will continue the tradition of meeting the challenge of future high performance diesel engines. However their misuse, disregard of standard precautions and the pursuit of expedient solutions to operational or design problems, all invariably result in costly inefficiencies. This is the theme of a paper presented at the 18th CIMAC Congress in Tianjin, PRC this June.

Higher wear occurs within cylinders because of poor combustion that can severely over-heat metal surfaces and produce excessive deposits. Superior quality lubricants are of little use in such circumstances and can not make up for inadequate fuel injection when this results in impingement of unburnt fuel on cylinder liners, which washes away the oil film.

Adequate oil supply to the sliding surfaces must be ensured at all times. Monetary savings achieves through reduction of oil consumption are illusory when, longer term, they result in reduced cylinder liner life and increased maintenance costs. Over-lubrication should also be avoided because of its economic and technical drawbacks. In essence, the lubricant supply should be dictated by what the engine really needs for proper operation.

Over-cooling, either through incorrect design or operation, should be avoided since it causes excessive corrosive wear. Higher alkalinity lubricants are generally able to control higher corrosive wear but are an expedient rather than an efficient solution. Adjustments and modifications to engine design and operation can reduce wear rates to the same low levels afforded by considerably higher alkalinity, hence higher cost lubricants.

Good care of lubricants is also a source of savings. For instance, if continuous water-washing of the lubricant through a faulty solenoid valve in the centrifuging system goes undetected, the alkalinity of the lubricant would be affected. The control of wear and cleanliness of the engine would be impaired and an expensive renewal of the oil change may be needed.

In conclusion, incorrect use of lubricants is ineffient and essentially a disservice to the shipping industry.

Reprints of the Exxon paper "Marine Diesel Lubricants: Uses and Abuses," are available on request from Exxon Company International, 200 Park Avenue, Florham Park, NJ 07928.

MOBIL

Circle 104 on Reader Service Card

Mobil Oil Corporation announced in 1989 the introduction of a new marine diesel engine lubricant product line—Mobilmar. Mobilmar diesel engine oils are formulated specifically for diesel engines used in marine applications. These new oils provide superior wear protection, excellent soot and high temperature deposit control, excellent alkalinity retention, and storage stability. Added features to these new Mobil marine lubricants are: excellent water separation characteristics and corrosion protection. Mobilmar 100 Series Oils have been designed to give optimum performance in Marine applications of Detroit Diesel engines, while providing good diesel performance in fleets with mixed engines; including Caterpillar engines. Mobilmar 300 Series Oils have been designed to give optimum performance in Caterpillar marine applications and meet the quality characteristics needed for the Caterpillar 3600 Series and 3500 Series engines.

In keeping with this approach to marine diesel engine lubrication, Mobil has also enhanced Mobilgard 450 oil to assure optimum non-zinc performance in EMD engines. Mobilgard 450 provides optimum performance for EMD engines, as well as all auxiliary and main marine engines requiring a CD-type diesel engine oil.

The Mobilgard series of marine engine oils includes Mobilgard 570, a quality marine diesel engine cylinder oil formulated to provide outstanding performance in high-output crosshead engines with brake mean effective pressures (BMEP) of 14 to 17 bar. These highly loaded crosshead diesels operate on heavy fuel oil with high sulfur content in order to reduce operating costs. Concurrently, advances in engine thermodynamics have permitted decreases in specific fuel consump-

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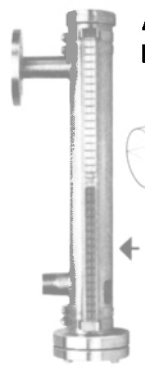
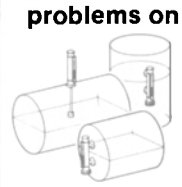
GEMS...unique chaices far marine tank gauging.

SureSite Level Indicators



An alternative to cloudy sight glass problems on shipboard day tanks.



Provides highly visible, accurate, safe, continuous indication. Externally-mounted; liquid within float housing. Used with water, oil, or corrosive, flammable or explosive liquids. Can incorporate switches or transducers for remote indication, alarms, etc.

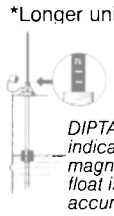
Bi-colored, interlocking magnetic flags change color as float moves with changing liquid levels.

L004

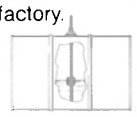
Non-electric DIPTAPE & DRUMTAPE Level Indicators

For on-the-spot use in storage tanks or drums where power is not available.

Operate manually in chemicals, oils, fuels, etc.
Only float and stem in contact with liquid.
Choice of materials and mountings. Indicating lengths from 6" to 72"*
Temperatures to 230°F.; pressures to 750 psi.
*Longer units available; consult factory.



DIPTAPE calibrated indicator lifts until magnetic interlock with float is felt for highly accurate readout.

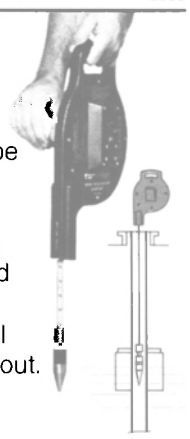


DRUMTAPE used in either vertical or horizontal drums (typically 30 or 55 gallons).

L003

Sounding Tape

Portable tank gauging in stationary tanks or barges.



An easy-to-read, fractionally-marked tape reels out of gun into a tank, or hollow nonferrous, tank-mounted tube or pipe. Powered by a 9V battery, unit features a magnetic float which rides with the liquid level and interfaces with a reed switch within the plumb bob to provide physical sounding for accurate (1/8") ullage readout. Coast Guard accepted for restricted or closed loading use. FM-approved for intrinsic safety with hazardous cargoes.

L006

For application information, call toll-free: (800) 321-6070.
In Connecticut call: (203) 677-1311.

IMO

Imo Industries Inc.
Gems Sensors Division
Cowles Road, Plainville, CT 06062
(203) 677-1311

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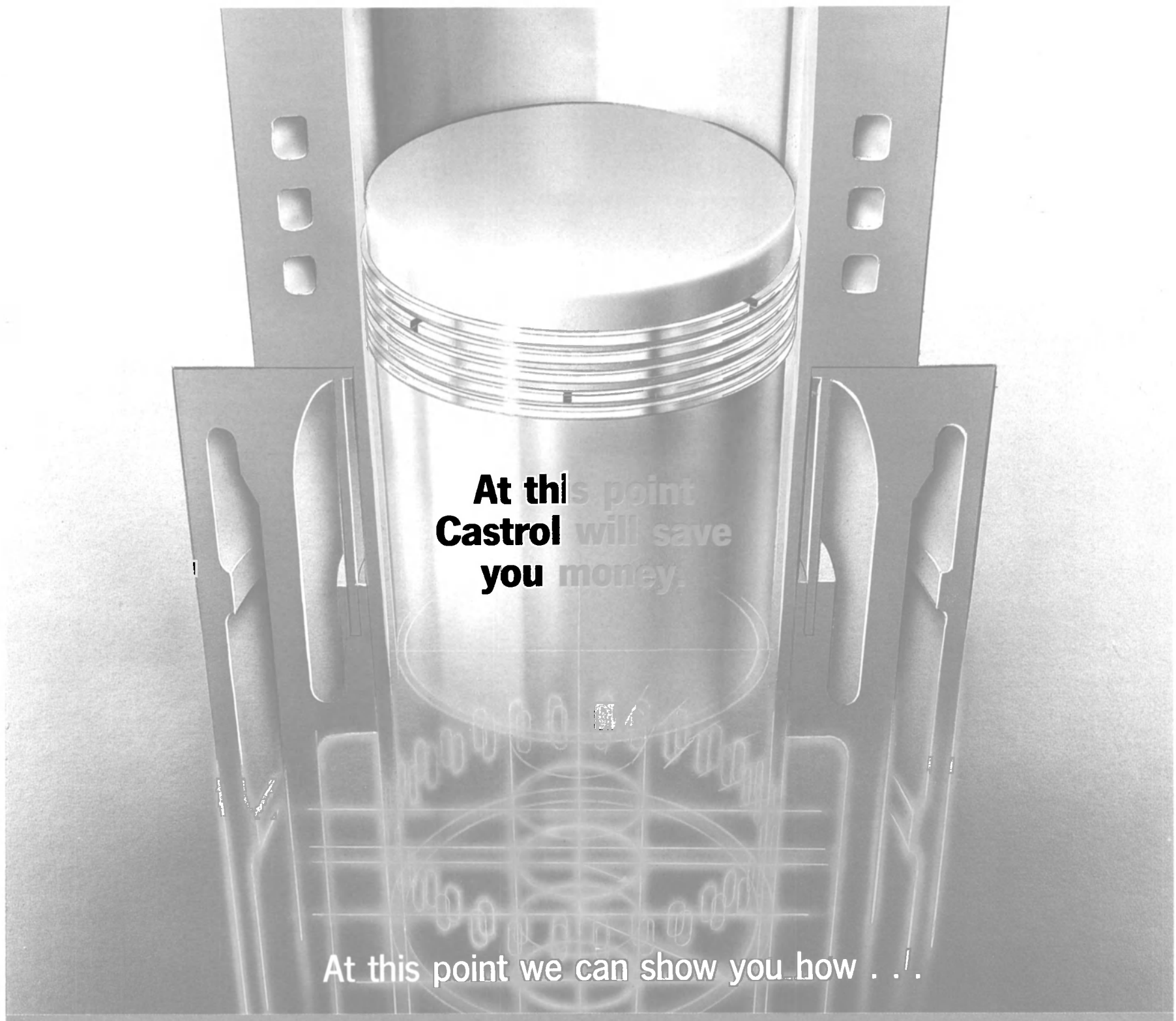

At this point we can show you how . . .

Castrol Marine Cyltech 80 is a new generation cylinder oil for crosshead engines which gives the first breakthrough in over 20 years in the battle against corrosive and abrasive wear. Developed after years of intensive research and testing, Cyltech 80 has been designed to satisfy the demands of the latest high powered super-long-stroke crosshead engines. Incorporated in its formulation is a new family of highly efficient acid neutralizing agents plus a special anti-wear additive combination* making Cyltech 80 eminently suitable for the cylinder lubrication of all crosshead engines.

* patent applied for

Name .....
Position .....
Company .....
Address .....
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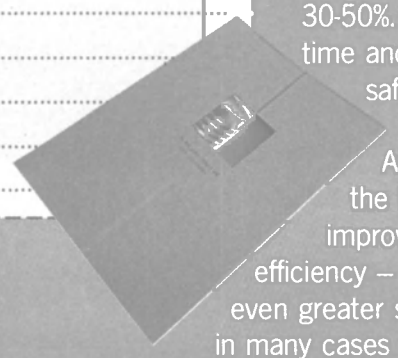


Castrol Marine Cyltech 80 can give reductions in liner and ring wear rates of at least 30% and overhaul intervals extended by 30-50%. It can reduce down time and provide an added safety factor against excessive wear.

All of these benefits – not the least being an overall improvement in engine efficiency – lead to cost savings and even greater savings can be achieved in many cases through reduced cylinder oil feed rates when using Cyltech 80.

Castrol MARINE OILS

Castrol Incorporated Marine Department, Raritan Plaza II, Raritan Center, Edison, N.J. 088 37. Telephone: (201) 225 6390. Fax: (201) 225 1069.

Circle 134 on Reader Service Card

Castrol
MARINE OILS

MEETING NEW DEMANDS THROUGH RESEARCH

2 MAJOR NEW MARINE OILS FROM Castrol

CDX 30

A 5 TBN alkaline detergent system oil specifically formulated to meet the requirements of all current and future crosshead engines. Through a carefully designed additive system it imparts excellent water-shedding and rust protection qualities, high oxidation resistance and thermal stability coupled with the load carrying properties of a gear oil.

MLC 30

The product of continuing development. MLC 30 is a 12 TBN heavy-duty formulation suitable for use in those higher rated engines using distillate fuels. It surpasses the MIL-L-2104C and API-CD performance levels and will find most usage within the coastal, inland waterway and fishing market segments.

MLC has gained approvals from all principal medium speed engine manufacturers.

Performance and Protection A Worldwide Promise

Circle 133 on Reader Service Card

Castrol Inc., Raritan Plaza II, Raritan Center, Edison, New Jersey 08837, Telephone No. (201) 225-6390, Telefax No. (201) 225-1069, Telex No. 219894 "CASED UR"
FOR MORE INFORMATION ON CASTROL AND THEIR WORLDWIDE SERVICES TO THE SHIPPING INDUSTRY, PLEASE CONTACT YOUR LOCAL CASTROL MARINE OFFICE OR CASTROL LIMITED, INTERNATIONAL MARINE, BURMAH HOUSE, PIPERS WAY, SWINDON, WILTSHIRE, SN3 1RE ENGLAND. TELEX 449221. TELEPHONE (0793) 30151.

continued

tion from 155 to 125 per bhp-hour. These changes in engine design for greater fuel efficiency, the use of higher viscosity residual fuels, and the need for reduced maintenance have increased the requirements on crosshead cylinder oil.

Mobilgard 570 was developed to provide high load-carrying characteristics, improved spreadability, tenacious film retention, and to minimize port and piston deposits. Because of its high alkalinity (70 Total Base Number or TBN), it provides better protection against corrosive wear by neutralizing large amounts of strong acids. This oil is compatible with oils normally used in the crankcase of crosshead engines.

Mobilgard 300 system oil was also developed especially for modern, high-output, crosshead type marine diesel engines. It is formulated from highly treated paraffinic base oils that are selected for their thermal stability and oxidation resistance. The inherent base oil characteristics are augmented with a balanced additive package including high-temperature oxidation inhibitors, alkaline detergent-dispersants, and defoamants. The formulation has maximum antiwear properties, good rust protection in the presence of salt water, and excellent water separation characteristics.

The Mobilgard 24 series oils were developed originally to meet the requirements of medium-speed, trunk piston diesels used for main propulsion engines on coastal and river vessels. The series was reformulated recently to provide improved performance in the new, higher-output versions of these engines now coming into service.

The Mobilgard 42 series of marine lubricating oils has been developed to supplement the Mobilgard 24 series (30 TBN) oils for the lubrication of modern high-output, medium-speed trunk diesel engines used in oceangoing vessels and ferries.

Mobilgard 42 oils have an alkalinity level of 40 TBN and are therefore particularly suitable for engines that show indication of corrosive wear to cylinder liners and piston rings.

Mobilgard SHC 120 is a 12 TBN synthetic, medium-speed diesel lubricant. It contains a balanced blend of synthesized hydrocarbons and ester-based fluids, with an additive system designed to provide optimum performance in diesel engines. Although its measured viscosity indicates that it is an SAE 40 grade, this oil's inherent high index enables it to perform similar to an SAE 15W-40 viscosity grade diesle engine lubricant. It is formulated for operation in extremes of ambient temperature.

The Mobilgard 12 series oils are intended for marine diesels operating in distillate fuels or light fuel blends. These oils have proven especially effective in small-bore, high-speed trunk engines and automotive-type diesels used in fishing fleets, the new severe service engines and in several types of medium-speed trunk piston engines. The oils come in viscosities of SAE 30, SAE 40 and SAE 50 and have a TBN of 15.

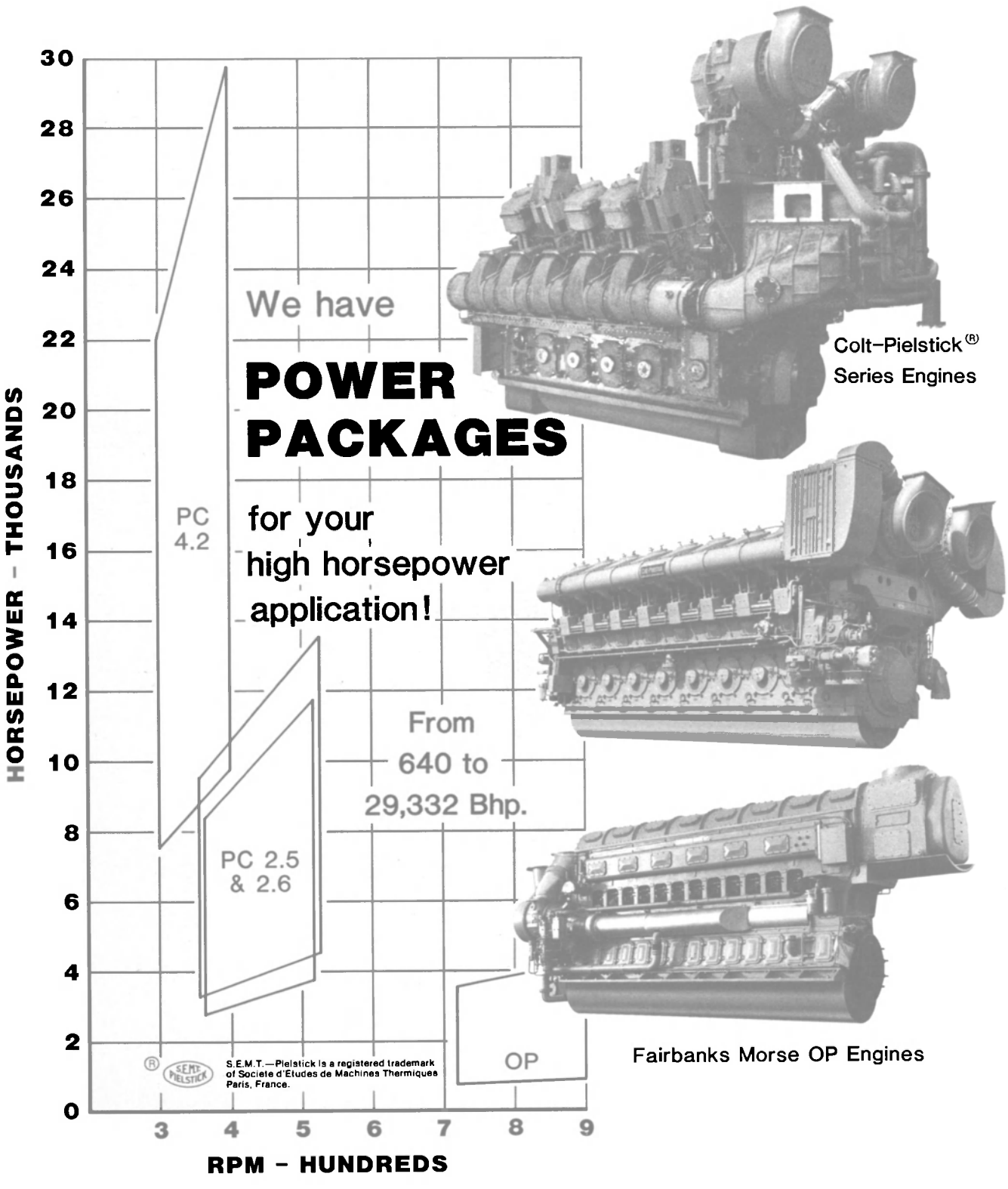
Other marine lubricants are available.

PENNZOIL

Circle 105 on Reader Service Card

In the small workboat and fishing vessel market, two-cycle outboard engines offer the performance advantages of high horsepower and light weight, as compared to a four-cycle engine design. Unfortunately, two-cycle outboard engines have special lubrication requirements, and care must be taken to select the proper lubricant.

The lubrication of two-cycle engines is accomplished by the mixing the oil with the fuel, either by premixing oil and fuel in the fuel tank or by an automatic injection system. As this mixture is drawn into the engine, the fuel evaporates, and oil is left behind to lubricate the bearings, cylinders, pistons and rings.



Colt Industries

Fairbanks Morse
Engine Division

Circle 225 on Reader Service Card

Excess oil is drawn into the combustion chambers where it is burned along with the fuel.

Because oil is burned along with the gasoline, two-cycle engines are especially prone to deposits in the combustion chambers, exhaust ports, piston rings and spark plugs. Therefore, special ashless-type detergent additives are blended into the oil to prevent deposit formation. The detergent additives blended into passenger car motor oils are compounds usually containing metals such as calcium and magnesium. When burned, these motor oils would leave behind an ash residue containing these metals. Ashless detergents used in two-cycle oils do not contain these metal compounds, and when burned, leave behind no ash deposits to foul spark plugs, stick rings, or block exhaust ports.

All major outboard engine manufacturers require the lubricant used in their two-cycle engine be approved by the National Marine Manufacturers Association (NMMA). This organization has standardized tests to measure an oil's ability to protect an outboard engine from rust, deposits, pre-ignition, and piston scuffing. In fact, this organization has just introduced a more rigorous test procedure and specification. Designated TC-W II, this specification includes more severe engine testing to measure the oil's lubrication ability and pre-ignition tendencies, higher fuel/oil ratios in the general performance engine testing to simulate the new 100:1 fuel-to-oil mixtures produced by the new Variable Ratio Oil (VRO) injection systems, and new tests to measure the oil's low temperature fluidity and resistance to gel formation.

Pennzoil Premium Outboard Lubricant was reportedly the first major oil brand to be approved by the NMMA as a TC-W II lubricant. Pennzoil has taken extensive steps to insure the quality and performance of this product. Pennzoil manufactures its Premium Outboard Lubricant "in-house" instead of using a contract blender/packager. Pennzoil has installed a totally dedicated system for handling this product's raw material ingredients, blending and packaging the finished outboard oil in quart bottles, gallon jugs, and 55-gallon drums. Pennzoil has also enacted very strict quality control procedures involving extensive testing of both raw materials and finished product.

Pennzoil's unending commitment to quality, in conjunction with the new NMMA TC-W II specification, assures the consumer that Pennzoil Premium Outboard Lubricant gives the consumer the ultimate in engine performance and protection.

TEXACO

Circle 110 on Reader Service Card

Texaco offers a complete line of quality marine lubricants which are available worldwide to meet the needs of all types of marine equipment.

For crosshead engines, Texaco offers TARO Special, a premium quality cylinder lubricant for large, slow-speed diesels burning residual fuels. It is blended from highly refined paraffinic base oils and oil soluble additives to produce a high alkaline reserve (70 TBN) product with good lubricant film strength. It is approved by all of the major crosshead engine builders. It is specially formulated to prevent corrosive wear and minimize ring deposits.

Taro Special EX 85 is a premium quality cylinder lubricant specifically developed to meet the requirements of Sulzer RLB engines. It has provided excellent performance in field tests and is approved by Sulzer for those applications where an 85 TBN product with a viscosity of 24 cst at 100 degrees C is specified.

DORO AR 30 (SAE 30) is a premium crankcase lubricant for large, slow-speed engines. It is blended from highly refined solvent neutral oils and carefully selected additives

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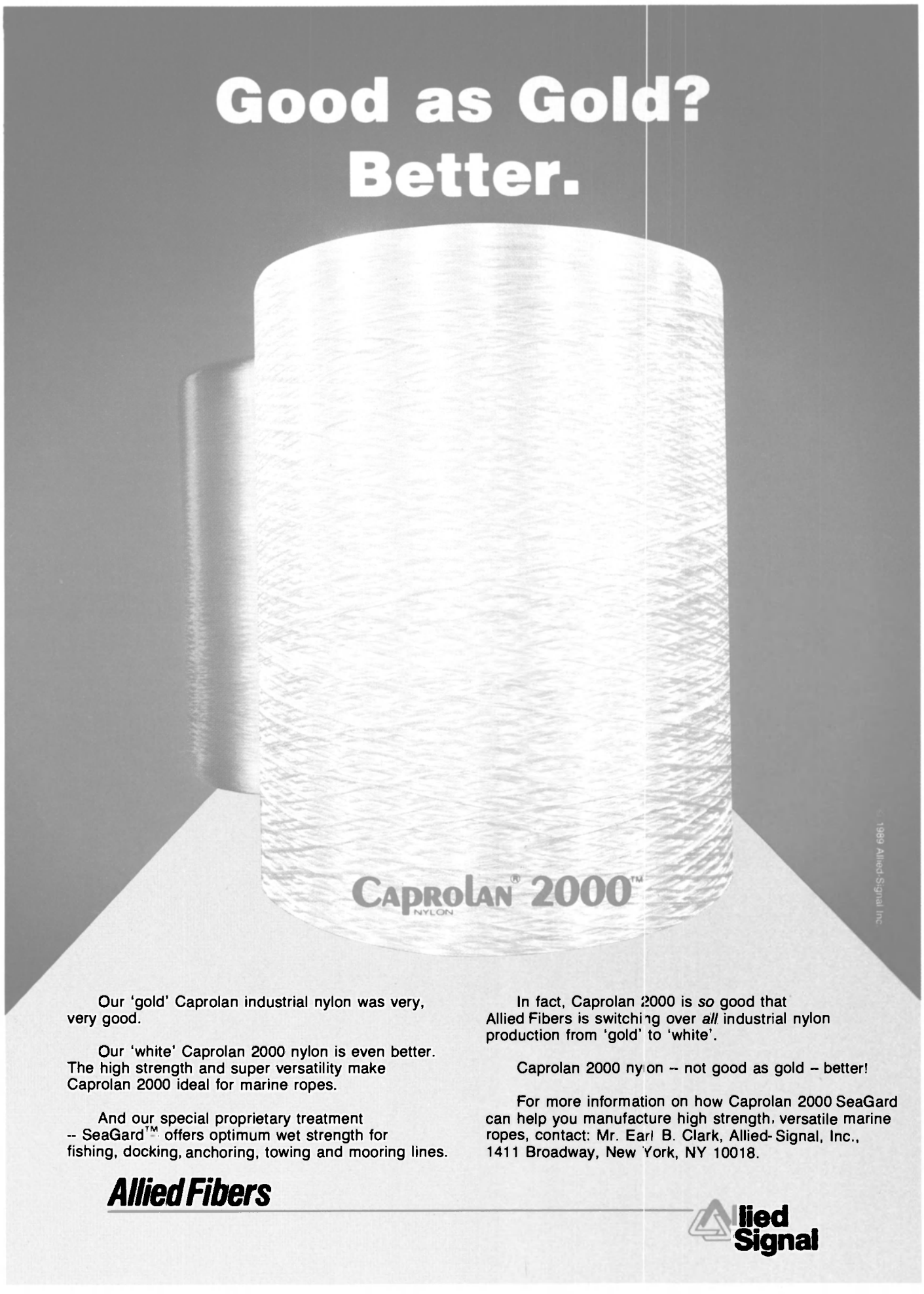

Our 'gold' Caprolan industrial nylon was very, very good.

Our 'white' Caprolan 2000 nylon is even better. The high strength and super versatility make Caprolan 2000 ideal for marine ropes.

And our special proprietary treatment -- SeaGard™ offers optimum wet strength for fishing, docking, anchoring, towing and mooring lines.

In fact, Caprolan 2000 is *so* good that Allied Fibers is switching over *all* industrial nylon production from 'gold' to 'white'.

Caprolan 2000 nylon -- not good as gold -- better!

For more information on how Caprolan 2000 SeaGard can help you manufacture high strength, versatile marine ropes, contact: Mr. Earl B. Clark, Allied-Signal, Inc., 1411 Broadway, New York, NY 10018.

Allied Fibers

Allied Signal

Circle 303 on Reader Service Card

Marine Lubricants

(continued)

to produce a moderate alkaline reserve (6 TBN) oil. This product offers unusually good rust and corrosion protection, wear protection and water separation characteristics. DORO AR 30 meets the Sulzer requirement for engines equipped with PTO units.

Texaco offers a complete line of trunk piston engine oils for medium and high-speed diesels. The specific lubricant required would be based on the sulfur content of the fuel being used in the engine. TARO XD oils, with a TBN of 15 minimum, are used in engines burning fuel with a sulfur content up to 1.8 percent. TARO DP oils, with a TBN of 30 minimum, are specifically designed for trunk type engines utilizing fuel with sulfur in excess of 1.8 percent. TARO XD and TARO DP are available in SAE 30 and SAE 40 viscosity grades. TARO XL 40 (SAE 40) is for use in medium-speed engines where the operating conditions or fuel sulfur content requires a 40 TBN product.

All of these oils are blended from carefully refined base oils fortified with specially developed additive packages to give excellent performance even under the most severe operating conditions. They have been extensively tested both in the laboratory and in the field. TARO XD, DP and XL 40 all offer excellent TBN retention and anti-corrosion properties. They are formulated with selected detergent and dispersant additives which minimize piston ring deposits, improve overall engine cleanliness and provide long in-service life.

Texaco supports its marine lubricants with prompt, efficient technical service and the Texlube used oil analysis program for monitoring the condition of the oils in use.

The Controllable Pitch Propeller that fulfills all requirements of today's and future shipbuilding technology:

Escher Wyss Propellers — advantageous for all ships — proven on the oceans of the world

Five-bladed nonmagnetic Escher Wyss propellers for a Mine Countermeasure Vessel

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Heavy Industries Ltd.
Tokyo, Japan

Earle M. Jorgensen Co.
Seattle, Washington, USA

VP 75

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Shell + L & L = Quality / Service

OIL CO., INC.

SHELL OIL and L & L OIL CO., INC.

Quality lubricants plus unmatched service. A total commitment to marine and offshore customers. Serving the entire Gulf Coast and lower Mississippi River on a 24 hour basis.

For more information on how you can be part of the winning formula, Call L & L OIL CO., INC. at 1-800-476-7449

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UNITOR

Circle 106 on Reader Service Card

The marketing of fuel treatments by Unitor Ships Service A/S has recently been dramatically strengthened by the acquisition of supplier Gamlen Chemical Company. Unitor marine chemicals are now drawn from the combined resources and expertise of both Perolin Marine, long know for its fuel treatments, and Gamlen Chemical Co. The result is a highly efficient and cost-effective range of fuel treatments, cleaners, and water treatments.

Unitor offers treatment products for such fuel handling system problems as sludge, water contamination, corrosion and bacteria/fungi.

A fuel conditioner such as Unitor's Fuelcare is effective against sludge formation in unstable fuels. The instability can have been caused by aging or long term heating, or by mixing incompatible fuels aboard.

Sludgy fuels often entrain water, thus by dispersing existing sludge and by preventing incompatibility, water contamination can be released for removal by settling/centrifuge.

Corrosion is prevented by the filming action of the fuel conditioner. The additive also chemically neutralizes acids in the fuel.

Where bacteria/fungi are present, it is first necessary to remove as much water as possible from the fuel and then to treat with a biocide. The biocide Bioclean is a "broad spectrum" biocide, meaning it is effective in killing a wide range of bacteria and fungi, an essential requirement for fuels since exact type of bio-activity is often not known.

Water contamination, especially saltwater contamination, in fuel can cause costly problems during combustion, such as high temperature corrosion of engine components by ash deposits. Fortunately, high temperature corrosion and ash deposition problems can be terated with additives such as Burnall or Cleanburn, which are effective in both these areas. With the use of a fuel conditioner these problems as well as storage tank and pipeline corrosion can be avoided.

Unitor also offers Gamabreak, a versatile and effective water demulsifying additive.

Allison General Manager Named GM Vice President

Dr. F. Blake Wallace

Allison Gas Turbine's general manager, Dr. **F. Blake Wallace,** has been named a vice president of the General Motors Corporation. The announcement was made in Detroit by **Roger B. Smith,** chairman, GM board of directors.

Indianapolis-based Allison Gas Turbine designs and manufacturers gas turbine engines for aircraft, marine and industrial uses. It is also a leader in the development of technology for use in gas turbine engines.

For more information and free literature,

Circle 12 on Reader Service Card

Free Color Brochure Details New Doucette High Tech Condenser

There continues to be a widespread growth of a new condenser design. This new condenser technology is presently being used in air conditioning and refrigeration in military ships, cargo ships, fishing fleets and offshore rigs, as well as smaller vessels.

According to **Roger Lynch,** sales manager for Doucette Industries, Inc., York, Pa., "This condenser is called a compact CounterFlow condenser. With this type of design, the condenser is smaller and costs 30-60 percent less than conventional shell and tube designs." The condenser is designed to be rugged and reliable, in addition to being mechanically cleanable for longer life.

Further, says Mr. **Lynch,** "The CounterFlow design replaces the conventional shell and tube designs, especially in the 1 to 40 horsepower applications. With 14 years of proven field experience, the use of this condenser is growing because of its compact size, reliability and lower cost.

The Doucette condenser is a high efficiency heat exchanger based on two principles—CounterFlow design and high performance tubes. Doucette claims the condenser uses 60 percent less material than a typical shell and tube type unit. The iunit uses TurboFlow tubes for high performance and reduced fouling. The condenser has a built-in "fail-safe" feature with no internal joints that protect the refrigeration circuit and compressor.

For a free color brochure from Doucette Industries,

Circle 9 on Reader Service Card

EC To Offer New Ship Registry

In an effort to halt the decline of its shipping fleet, the European Commission announced a proposal for an EC shipping register.

The new flag, to be called Euros, will offer cabotage rights and other advantages to European Community-based shipowners. The Euros flag will exist alongside established EC national flags.

According to **Karel van Miert,** EC transport commissioner, Euros-flagged ships would have certain operating cost advantages which would make them more competitive in the world market.

NKK Receives $132-Million Order For Two LPG Ships

Japanese shipbuilder NKK recently received a $132-million order from Bergesen dy of Norway. Both of the 78,000-m³-capacity ships are scheduled to be delivered in 1991.

Naval Testing.

Wyle delivers a full fleet of services.

Wyle delivers the unique environmental testing the Navy demands.

We provide 167 vibration and 901 shock testing, steam testing (NAVSEA QSL), natural environments, acoustic services (including underwater measurements), test tailoring, and dynamic analysis.

We have 40 years of independent test experience and test facilities throughout the United States. We can provide a naval test program that is reliable, on time, and within budget.

For more information on Wyle's full range of test services, call Program Development in Huntsville, AL at (205) 837-4411, Norco, CA at (714) 737-0871 or Hampton, VA at (804) 865-0000.

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Pictured above are some of the guests who attended a luncheon recently at Daphne's Restaurant, Sheraton Hotel near Port Newark, Elizabeth, N.J. Left to right: **Joseph Walsh,** Marine Transport Lines, Inc.; **Thomas Jones** and **Steve Makrinos** of Sea-Land Service, Inc., Edison, N.J.; **Charles Nealis,** Bay Tankers, Inc.; **Richard Mushet,** Mobil Oil Corp., Staten Island, N.Y.; and **Walter Thorsen,** marketing representative for Colonna's Shipyard. Other luncheons were held in Greenwich, Conn., and uptown New York City.

James Bolger Of Colonna's Shipyard Addresses Technical Staffs Of Leading Shipowners

James D. Bolger, assistant general manager, marketing-estimating of Colonna's Shipyard, Inc., Norfolk, Va., was recently in the New York area to address members of the technical staffs of leading shipowners at special luncheons sponsored by the yard's exclusive marketing representative-U.S. and Canada, **Walter Thorsen** of Walter Thorsen, Inc., Mahwah, N.J.

Mr. **Bolger** informed the guests of the present capacities of the yard including a floating drydock with a lifting capacity of 17,200 tons and three marine railways, largest of which can accommodate vessels up to 5,000 tons. He explained the firms 10-year improvement plant to update its facilities by adding more pier space and improving production capabilities. The shipyard has had a cooperative working relationship with its employees since 1985 and has been operating at near full capacity. The yard offers its employees a variety of incentive programs to promote a team spirit with high morale.

Colonna's has been very successful with tugs/barge trade, U.S. Navy, U.S. Coast Guard and MarAd, and is endeavoring to increase their commercial business with the tug/barge trade and American/foreign shipowners of all types of vessels.

For free literature detailing the facilities and capabilities of Colonna's Shipyard,

Circle 22 on Reader Service Card

360-Passenger 'Wave Piercer' Delivered By Nichols Brothers

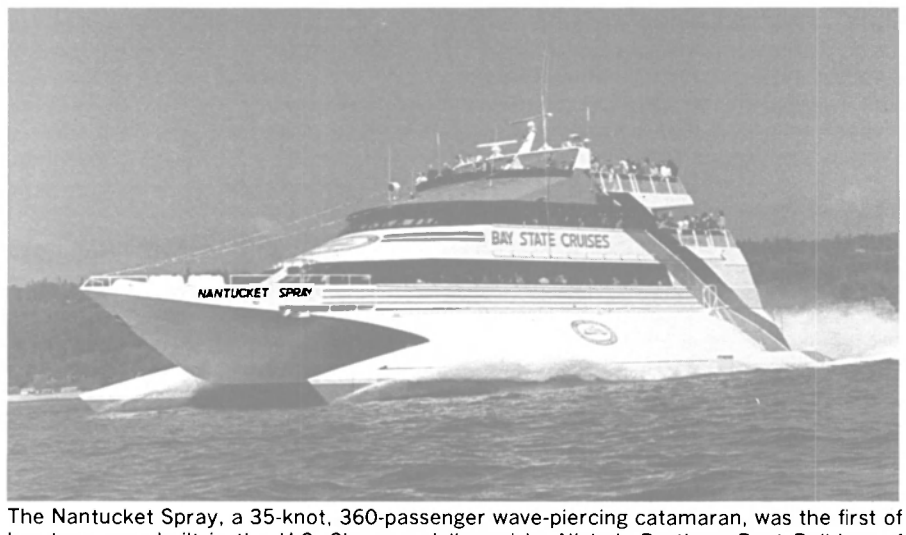
Looking somewhat like a cross between a catamaran and a hydrofoil, the 360-passenger wave piercer M/V Nantucket Spray was recently delivered by Nichols Brothers Boat Builders, Inc., Whidbey Island, Wash., to Bay State Cruises of Massachusetts.

The Nantucket Spray was designed by International Catamaran Designs, Pty., Ltd., of Australia. Four wave piercers have been built in Australia after nearly a decade of research by INCAT. Nichols Brothers , one of INCAT's licensees in the U.S., has built a number of high-speed passenger catamarans, but none as unique as the wave piercer.

The vessel derives its name from its two slender catamaran hulls which tend to pierce waves rather than ride up over them. Streamlined struts suspend the passenger cabins above the waves, although the superstructure bottom is a trihederal shape to dampen wave shock when in high sea states.

At present, the Nantucket Spray is being operated by Bay State Cruises between Boston and Nantucket Island. The vessel, which has a passenger capacity of 360 at 35 knots, makes one round trip daily from June to October.

The 121-foot vessel has a beam of 52 feet and draft of 4 feet 10 inches at full load. She is fitted with two fresh-water-cooled Deutz MWM V16 TBD604 main diesel engines. Coupled to ZF reduction gears, the engines produce 2,371 hp. The engines were supplied by KHD Canada, Inc. The gears drive KaMeWa 63-S62/6 waterjets. An engine room



The Nantucket Spray, a 35-knot, 360-passenger wave-piercing catamaran, was the first of her type ever built in the U.S. She was delivered by Nichols Brothers Boat Builders of Whidbey Island, Wash.

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NANTUCKET SPRAY
Equipment List

Main engines (2)	Deutz MWM
Reduction gears	ZF
Waterjets	KaMeWa
Propulsion & steering controls	KaMeWa
Fuel filters	Racor
Generators	Northern Lights
Generator engines	Deere
Pumps	Paco
Monitoring system	Pyrotronics
Coatings	Hempel Paint
Wiring & light fixtures	Hardware Specialties
Seating	Marine Interiors
Radar	Furuno
UHF	Motorola
Loud hailer	Raytheon
VHF radiotelephone	SEA
SSB radiotelephone	SEA
Speed & distance log	Datamarine
Autopilot	Robertson
Loran C	NorthStar
Phone system	Aiphone

in each hull is also fitted with Northern Lights generating plants, consisting of John Deere engines and 55-kw generators, from Alaska Diesel Electric of Seattle.

Layout on the main deck includes a snack bar and refreshment center; a food preparation space; perimeter dinettes; and airline-type seating. Open air seating is available on the top deck and on the fantail of the second deck. The cabin of the second deck also contains airline-type seating. Seating was supplied by Marine Interiors of Langley, Wash.

At 35 knots, said **Matt Nichols**, excluding hydrofoils, "we believe that the wave piercer provides the fastest high-speed marine passenger transportation in the country, and does it with outstanding rough water comfort."

The christening ceremony for the Nantucket Spray also marked the 25th anniversary of the Nichols Bros. Boat Builders' yard on Whidbey Island.

For free literature detailing the boatbuilding services of Nichols Brothers,

Circle 76 on Reader Service Card

Literature Offered By G.A. International On Marine Electronics

G.A. International Electronics Corporation, Staten Island, N.Y., is offering free literature on a new Magnavox GPS products, as well as Simrad/Anritsu color and monochrome radar.

The Magnavox MX-5400R is designed to be added to the proven MX-4102 and MX-5102 Transit Satellite Navigation receivers, providing a cost-effective method to add GPS navigation to vessels currently fitted with these transit navigators.

Simrad reports price reductions on its recently introduced RA-710 color and RA-720 monochrome radar product lines.

G.A. International Electronics Corporation is a full service sales and repair organization representing some of the most prominent marine electronics manufacturers in the industry.

For free literature detailing any of the products represented by G.A. International,

Circle 85 on Reader Service Card

Electromatic's New Gauge Measures Wall Thickness, Corrosion From One Side

The new pocket-size, battery-powered Check-Line® Model TI-10 Digital Ultrasonic Thickness Gauge from Electromatic Equipment Co., Inc., Cedarhurst, N.Y., measures wall thickness and extent of corrosion and erosion of metal plates, bulkheads, ships hulls, storage tanks, pressure vessels, boilers and pipe—from one side. The TI-10 measures steel wall thicknesses from 0.060 inches to 3.000 inches and 1.5 to 80.0 mm, switch selectable, with a measuring accuracy of 0.5 percent. Special-purpose models for small bore pipe, cast iron and high-temperature applications are also available.

For further information and free literature,

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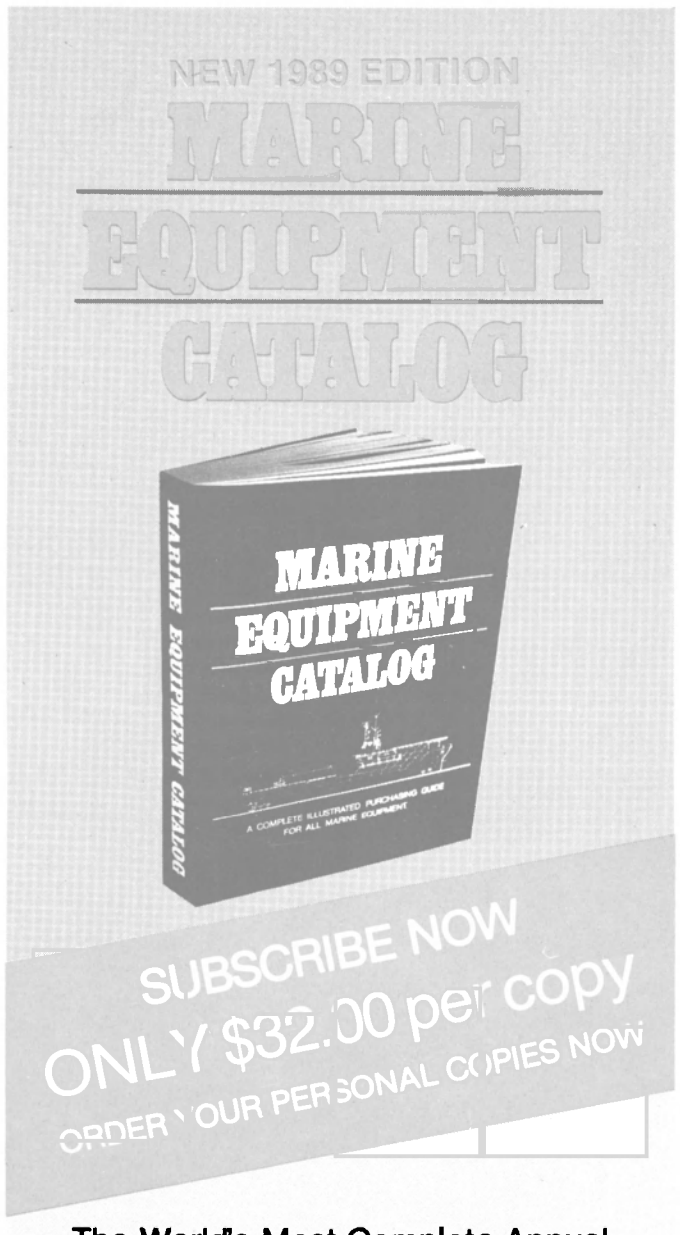

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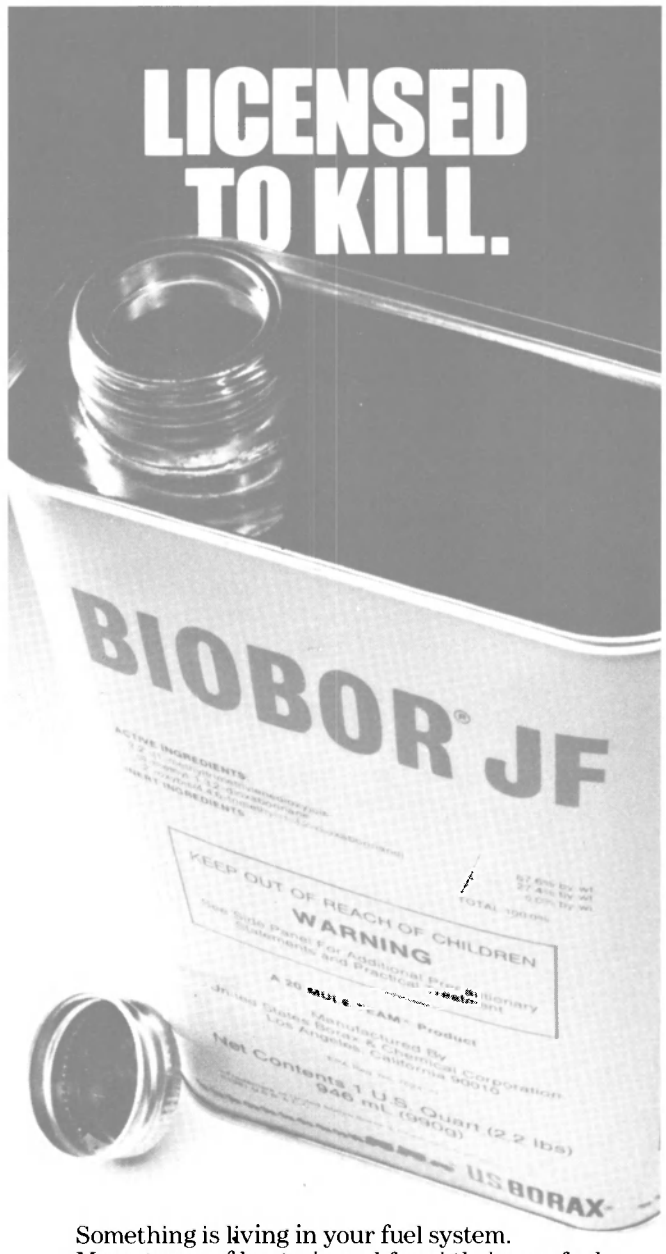

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ON
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Coast Guard To Reexamine Rules On Ship Repair

Because of a recent court decision, the U.S. Coast Guard will review its rules governing the extent to which U.S-flag ships can have work performed in foreign shipyards without jeopardizing the vessels' eligibility for U.S. domestic trading. Any changes in the rules would affect both U.S.-flag vessel owners and U.S. shipyards.

The decision was issued by U.S. District Court Judge **Joyce Hens Green** as part of a case involving the U.S.-flag cruise ship Monterrey, which underwent an extensive refurbishment at U.S. and Finnish shipyards.

According to the Jones Act, any ships that carry cargo from one U.S. port to another must be built in a U.S. shipyard. If these vessels undergo an "entire rebuilding," the work must also be performed at a U.S. shipyard.

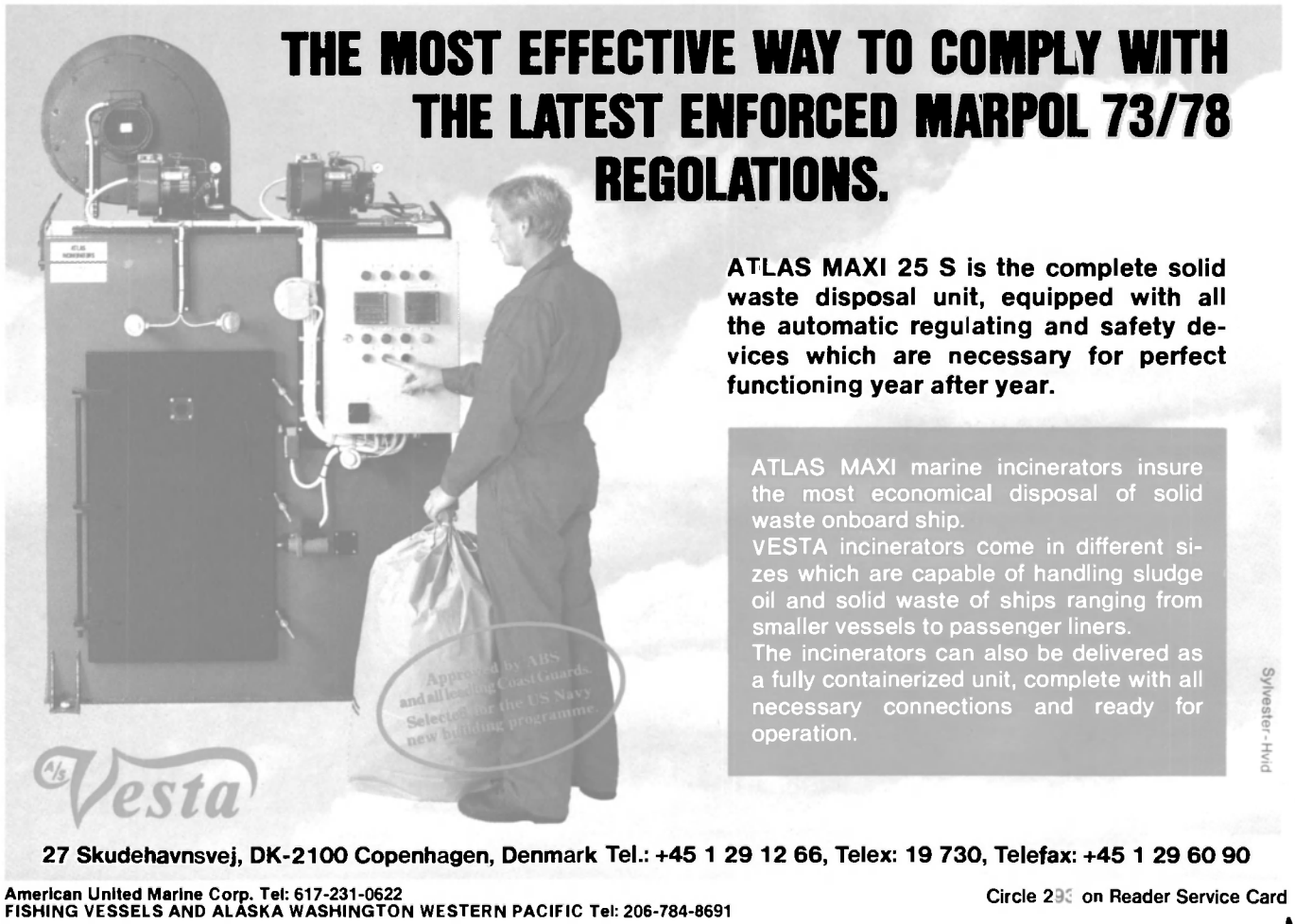
Judge **Green** ruled that the Coast Guard has been inconsistent in its decisions involving the work carried out on U.S.-flag vessels by foreign shipyards. In the past, the Coast Guard had generally required all structural work to be performed in U.S. yards, while permitting non-structural work to be carried out at foreign yards. Judge **Green** wants the agency to clearly define structural and non-structural work.

U.S. shipyards might benefit from the decision if new Coast Guard rules force owners to carry out certain ship repairs domestically rather than abroad as in the past.

Merger Of Two Lines Forms World's Largest Ocean Fleet Operator

Two Japanese shipping lines recently merged to form what is said to be the world's largest global ocean fleet operator.

The new line, Navix, was formed by the merger of Japan Line Ltd., Tokyo, a leading tanker operator, and Yamashita-Shinnihon Steamship Co., Tokyo, a major bulk carrier operator. Navix Line will operate a fleet of 246 oceangoing vessels.



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BUYERS DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER/Engineering News. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR/EN assumes no responsibility for errors. **If you are interested in having your company listed in this Buyers Directory Section, contact John C. O'Malley at (212) 477-6700.**

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Adrick Marine Corp., 320 Cantor Ave., Linden NJ 07036
Bailey Group, 2323 Randolph Ave., Avenel, NJ 07001
Cospolich Refrigerator Co., 949 Industry Rd., Kenner LA 70062
Stal Refrigeration AB, Butangsgatan 16, S-60187 Norrkoping SWEDEN

BALLAST
Genstar Stone Products, Executive Plaza IV, Hunt Valley, MD 21031
Mineral Research & Recovery Inc., 4565 S. Palo Verde, Ste 203, Tucson AZ 85714

BARGES—Leasing
McDonough Marine Service, P.O. Box 1825, Parkersburg WV 26101

BASKET STRAINERS
Beaird Industries, P.O. Box 31115, Shreveport, LA 71130
Cleveland Gear, 3249 E. 80 St., Cleveland OH 44104

BEARINGS—Rubber, Metallic, Non-Metallic
B.F. Goodrich (formerly L. Q. Moffitt, Inc.) P.O. Box 5550, Akron, OH 44313
Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Kingsbury Inc., 10385 Drummond Rd, Philadelphia PA 19154
Thomson Gordon Ltd., 3225 Mainway, Burlington, Ont., CANADA L7M 1A6

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

BROKERS
Captain Astad Company, Inc., P.O. Box 350486, Ft Lauderdale FL 33335; P.O. Box 1093, Houma, LA 70360
Jack Faulkner Inc., 2419 Caddy Lane, P.O. Box 371, Flossmoor IL 60422
Mowbray's Tug & Barge Sales Corp., 35 De Hart St., Morristown NJ 07960

BULKHEADS
The Waugh Co./Rockment (TNF), 5111-6 Baymeadows Rd., Suite 394, Jacksonville, FL 32217

CARGO ACCESS EQUIPMENT
Morgan Crane Co., Inc. (Hiab SeaCranes and QMC Trident, Ferrari, Fassi marine cranes), 1009 E. Chestnut Ave., Santa Ana CA 92701

CARGO HANDLING SYSTEM
Skarpenord A/S, US Agent: American United Marine Corp., 5 Broadway, Rte 1, Saugus MA 01906

CHAIN
Crandall Dry Dock Engineers Inc./Marit Chain, 21 Pottery Lane, Dedham MA 02026
Milligan Marine Supply Inc., 5832 Harvey Wilson, Houston TX 77020
Washington Chain & Supply, 2901 Utah Ave South, Seattle WA 98124

COMPACTORS
ICI Multi-Pak Inc., 14719 Carolcrest, Houston TX 77079
TFC Corp., 9819 Logan Ave., So., Minneapolis MN 55431. Sales Agents: American United Marine, 5 Broadway, Rte 1, Saugus MA 01906

COMPUTERIZED INFORMATION SYSTEMS
TIMSCO, P. O. Box 91360, Mobile AL 36691

CONDENSERS/SEPARATORS
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Doucette Industries, Inc., 701 Grantley Road, P.O. Box 2337, York, PA 17405
Wright Austin Co., 3250 Franklin St., Detroit MI 48207

CONTROL SYSTEMS—Monitoring
ASEA, Inc., 4 New King St., White Plains, NY 10604
The Clark-Reliance Corporation, 16633 Foltz Industrial Parkway, Strongsville OH 44136
IMO Industries, Gems Sensors Division, One Cowles Rd., Plainville CT 06062
Indikon Division, Metravib Instruments Inc., 26 New St., Cambridge, Ma 02138
MMC International (Marine Moisture Control), 60 Inip Dr, Inwood NY 11696
NAMCO Controls, 7567 Tyler Blvd, Mentor OH 44060
Schrader Bellows, P.O. Box 631, Akron OH 44309
TANO Marine Systems Inc., 4301 Poche Court West, New Orleans LA 70129
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Valmet Automation A.S., P.O. Box 130, N-3430, Spikkestad, Norway

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ASEA-Hagglund, Inc., 50 Chestnut Ridge Rd., Montvale NJ 07645
The Crosby Group, Inc., P.O. Box 3128, Tulsa OK 74101
Del Gavio Marine Hydraulics Inc., 207 W. Central Ave., Maywood NJ 07607 telex: 132610 DELMARINE
Liebherr-Werk Nenzing GES.mbh, P.O. Box 10, A-6710 Nenzing, AUSTRIA
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
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J.D. Neuhaus, Hebezeuge, D5810, Witten Heven, West Germany
Pettibone-Tiffin Corp., 235 Miami St., Tiffin, OH 44883
Westmont Industries, 10805 Painter Ave., Santa Fe Springs, CA 90670

DECK MACHINERY—Cargo Handling Equipment
Braden Carco Gearmatic, P.O. Box 547, Broken Arrow, OK 74013
Gearmatic—see 'Braden Carco Gearmatic' above.
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, WA 98134
McElroy Machine & Mfg. Co., Inc., P.O. Box 4455, Biloxi MS 39535
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Schoellhorn-Albrecht, P.O. Box 22110, St Louis MO 63116

DIESEL ACCESSORIES—CYLINDER LINERS
Acurex Corporation, Autodata Division, 555 Clyde Ave., P.O. Box 7042, Mountain View, CA 94039
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Diesel America Inc., 5217 River Rd., New Orleans LA 70123
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, MA 02360
Kiene Diesel Accessories, 325 S. Fairbanks St., P.O. Box 386, Addison IL 60101

DIESEL ENGINE—Spare Parts & Repair
Bergen Diesel A/S, P.O. Box 924, N-5001 Bergen NORWAY
Bergen Diesel Inc., 2701 Delaware Ave., Kenner LA 70062
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Cummins Engine Company, Mail Code 60011, Box 3005, Columbus, IN 47202-3005
MAN B&W Diesel GmbH, Stadtbachstrasse 1, D-8900 Augsburg 1, Federal Republic of Germany
MAN B&W Diesel, 50 Broadway, 18th Fl., New York, NY 10004
Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, Federal Republic of Germany
Sims Pump Valve Co., Inc., 1314 Park Ave., Hoboken NJ 07030
Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166

DIVING & SALVAGE
H.J. Merrihue, P.O. Box 23123, New Orleans LA 70183

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Marine Design Services, P.O. Box 928, Bonita CA 92002

ELECTRICAL EQUIPMENT
L. F. Gaubert & Co., Inc., P. O. Box 50500, New Orleans LA 70150
MMC International (Marine Moisture Control), 60 Inip Dr, Inwood NY 11696
SPD Technologies, 13500 Roosevelt Blvd., Philadelphia PA 19116
Ward Leonard Electric, 31 South St., Mt. Vernon, NY 10550
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

ELECTROMAGNETICS
Sentel Corp., 6713 Robinia Rd., Camp Springs MD 20748

ELECTRONIC ENCLOSURES
A&J Manufacturing, 14131 Franklin Ave., Tustin CA 92680

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

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

EQUIPMENT—Marine
Thomas Coudon Associates, 6655 Amberton Dr., Baltimore, MD 21227
Dynabrade, 72 E Niagara St., Tonowanda NY 14150
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302
Space Machine & Engineering Corp., 2346 16th Ave North, St Petersburg FL 33713

EVAPORATORS
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Equipment Engineering, 666 Baker St., #265, Costa Mesa CA 92626
MECO (Mechanical Equipment), 861 Carondelet St., New Orleans LA 70130
Water Technologies, Div. of Aqua Chem, P.O. Box 421, Milwaukee WI 53201

FANS—VENTILATORS—BLOWERS
Carling Turbine Blower Company, 10 Nebraska St., P.O. Box 88, Worcester MA 01613
Flebu A/S, US Agent: American United Marine Corp., 5 Broadway, Rte 1, Saugus MA 01906
Jon M. Liss Associates, Inc., 411 Borel Ave., San Mateo, CA 94402

FASTENERS
Action Threaded Products Inc., 6955 S. Harlem, Bedford Park, IL 60638
Hardware Specialties Co., Ships Division, 48-75 36th St, Long Island City NY 11101
Lee Brass Company, P. O. Box 1229, Anniston AL 36202
Non-Ferrous Bolt & Mfg Co., 4085 Nevso Dr., Suite C, Las Vegas NV 89103
Okabe Co., Inc., 175 Lively Blvd., Elk Grove Village, IL 60007

FENDERING SYSTEMS/BUOYS—Dock & Vessel
Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Milligan Marine Supply Inc., 5832 Harvey Wilson, Houston TX 77020
Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook VA 22624

FUEL ADDITIVE
U.S. Borax, Industrial Chemicals, 3075 Wilshire Blvd., Los Angeles CA 90010

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Gaylord Industries, 10900 S W Avery St, P.O. Box 1149, Tualatin, OR 97062
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454

GANGWAYS, LADDERS
Coast Marine & Industrial Supply Inc., 398 Jefferson St., San Francisco, CA 94133
A.L. Don, 1 Don Plaza, Dock St., Matawan NJ 07747
National Specialty Products, 5727 Heffernan St., Houston TX 77087
Rampmaster Inc., 9825 Osceola Blvd., Vero Beach, FL 32960
Westmont Industries, 10805 Painter Ave., Santa Fe Springs, Los Angeles, CA 90670
Wooster Products Inc., 1000 Spruce St., P.O. Box 896, Wooster, OH 44691

HEAT EXCHANGERS
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Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130
Doucette Industries, Inc., 701 Grantley Road, P.O. Box 2337, York, PA 17405
MECO (Mechanical Equipment), 861 Carondelet St., New Orleans LA 70130

HORNS/WHISTLES
Kahlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241

HYDRAULICS
Aeroquip Corporation, 300 South East Ave., Jackson, MI 49203
Cunningham Marine Hydraulics Co., 201 Harrison St., Hoboken NJ 07030
Del Gavio Marine Hydraulics Inc., 207 W Central Ave., Maywood NJ 07607; telex: 132610 DELMARINE
Parker Hannifin Corporation, 17325 Euclid Avenue, Cleveland, OH 44112

INCINERATORS
Teamtec A/S, P.O. Box 100, N-4912 Gjeving, NORWAY
A/S Vesta, 27 Skudehavnsvej, DK-2100 Copenhagen DENMARK. US Agent: American United Marine, 5 Broadway, Rte 1, Saugus MA 01906

INSTRUMENTATION
Technical Services Group, 2900 Main St., Alameda CA 94501

INSULATION—Cloth, Fiberglass
Soundcoat, One Burt Drive, Deer Park NY 11729

JOINER—Watertight Doors—Paneling—Ceiling Systems—Decking
Astech, 3030 S. Red Hill Ave., Santa Ana, CA 92711
Feathers Corporation, P.O. Box 934, 5240 E. 5200th So., Langley, WA 98260
IMAC AB, Berga Alle 1, S-252 55 Helsingborg, SWEDEN
Johnson Construction Specialties, Inc., 3420 Rusk, P.O. Box 1360, Houston, TX 77251
E.H. O'Neill Company, 5515 Belair Rd., Baltimore MD 21206
Walz & Krenzer Inc., 1390 Mt. Read Blvd., Rochester NY 14606
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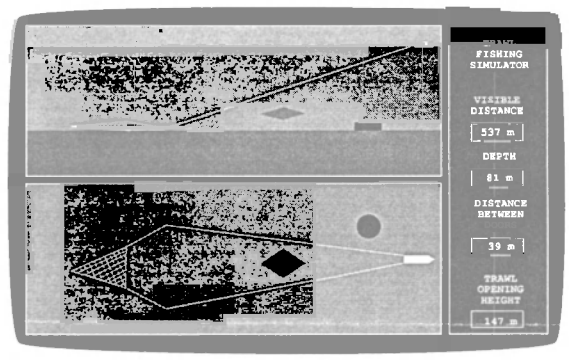

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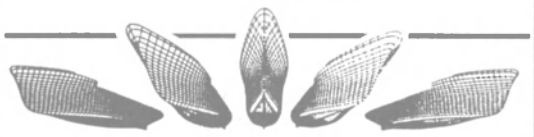

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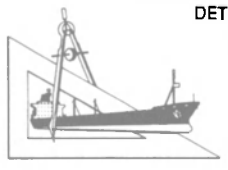

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ELECTRONICS UPDATE

Si-Tex Introduces Next Generation Electronic Charting System

—Literature Available—

The NAV-ADD 3000 is the next generation of electronic charting systems from Si-Tex. It is a substantially upgraded version of the popular NAV-ADD 2000 introduced last year.

You just add the NAV-ADD 3000 to your Loran, Satnav, GPS, Decca or Omega, insert a Digimap cartridge and you have a bright visual display of your position on an electronic video chart.

Show the NAV-ADD 3000 where you want to go with a cursor on the screen and at the touch of a button, it will plot the most direct course to any point on the chart from your present position. A Dynamic Status Window digitally displays your present position Lat/Lon coordinates, speed and course over ground, range bearing and time-to-go to your selected waypoint. Navigation page displays your selected waypoint coordinates, leg distances, total distance from starting point, true headings, compass headings and total time to go.

As you travel to your waypoints, the NAV-ADD 3000 will automatically update your position on the chart, pan and scroll the chart to keep your vessel within the display, indicate any cross-track error and your position relative to land. It can even drive your autopilot to your destination via NMEA 0180 interface.

Si-Tex NAV-ADD 3000 Electronic Charting System.

Utilizing a full 16-bit central processing unit, the NAV-ADD 3000 offers a plotting capacity of up to 2,800 nautical miles of track, 10 independent tracks, 280 waypoints and 50 event markers.

As a word of caution, the Si-Tex NAV-ADD 3000 Electronic Charting System and Digimap charts are not designed to replace your standard NOAA navigation charts. Any electronic navigation device should be operated along with the prudent use of reliable manual backup material.

For more information on the new NAV-ADD 3000 from Si-Tex,

Circle 24 on Reader Service Card

MSI Opens Fourth Diesel Engine Repair Facility In St. Louis

Marine Systems Inc. (MSI), an international diesel engine repair and parts company, has established a 24-hour operation serving the St. Louis area.

Headquartered in Shriever, La., with centers also located in Harvey, La., and Chesapeake, Va., MSI now has a 14,000-square-foot shop and warehouse at 140 West Circle Drive in East Alton, Ill.

The new location will be guided by **Mike Hawkins,** general manager, and **Gene Sivia,** service manager, who have over 35 years' experience in the marine repair business. They are backed by MSI's skilled technicians and a warehouse stocked with engine components and accessories, including genuine EMD engine parts and Flak reduction gear parts.

MSI's technicians are factory-trained to perform all types of engine and reduction gear repairs, from routine maintenance and emergency repairs to complete overhauls, including block and gearcase welding and machining.

At present, MSI specializes in diesel engine repairs to towboats, tugboats, supply boats, dredges and military applications.

For more information and free literature from Marine Systems,

Circle 6 on Reader Service Card

Martin Named Ship Operations Manager Of AWSC

Cornel Martin has been named the new manager of shipyard operations for the American Waterways Shipyard Conference (AWSC).

Mr. **Martin** served as senior professional staff member on the House Subcommittee on Coast Guard and Navigation, where he represented the chairman before various groups and associations, drafted amendments, legislation, correspondence and speeches, and worked closely with the Coast Guard, industry, the Maritime Administration, the Crops of Engineers, and other maritime-oriented agencies and organizations.

Sulzer Wins Order For S20 Diesels

Diesel engine manufacturer Sulzer won its first propulsion order for the recently introduced medium-speed, four-stroke S20 engine.

The seven-engine order was awarded by Pesquera Loa Norte of Santiago, Chile. The diesels will be used to re-engine seven 121-foot fishing vessels. Each vessel will feature a six-cylinder S20, which will develop 1,185 bhp at 1,000 rpm.

For free literature on the model S20 diesel engine from Sulzer,

Circle 75 on Reader Service Card

Norwegian Yard Wins Order To Build Chemical Carrier

Fosen Mek Verksteder of Norway recently was awarded a contract to build a 7,500-ton chemical products carrier for Norwegian owners. The carrier is expected to be delivered by Fosen's Fevag yard bv February 1990.

Sale Of H&W Shipyard To Be Completed By Fall

According to an announcement by the U.K. Government, the deal to sell the Belfast shipyard of Harland & Wolff is expected to be completed by September of this year.

The yard will be sold to a consortium led by **John Parker**, present chairman of H&W, and **Fred Olsen**, a Norwegian shipowner.

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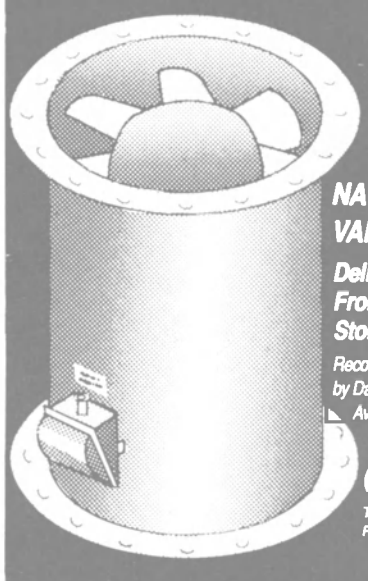

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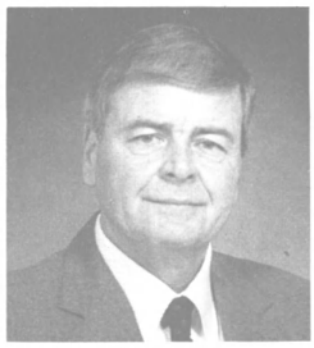
Colonna's Appoints Sherman And Blenkhorn

Lewis E. Sherman



James M. Blenkhorn

Lewis E. Sherman has joined Colonna's Shipyard, Inc. of Norfolk, Va., as the assistant general manager-operations. In this position, Mr. **Sherman** will be responsible for the direction of all activities in production, maintenance/facilities and human resources.

Mr. **Sherman** comes to Colonna's Shipyard, Inc. from Metro Machine, where he worked for 11 years as vice president and general superintendent. Mr. **Sherman** has over 25 years' marine experience.

James M. Blenkhorn has joined Colonna's Shipyard as the assistant general manager-programs and support. In this position, Mr. **Blenkhorn** will be responsible for direction of all activities in engineering, planning/scheduling, purchasing, subcontracts, material control and expediting, warehousing, quality assurance and program management/contract administration.

Mr. **Blenkhorn** comes to Colonna's Shipyard, Inc. from Bath Iron Works as senior vice president for business and technical development. Mr. **Blenkhorn** has over 30 years of new construction and marine experience.

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- Major Manufacturers of Ship Systems and Components
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- Amended FY 1990-1994 Defense Spending Projection
- Breakdown of DOD Budget by Service and Type Expenditures: 1990-1991
- Impact of Fiscal Constraints on FY 1990 and FY 1991 Budget Request
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- Issues Raised Concerning the Quality and Realism of SPY-ID Aegis System Testing
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- Combat Logistic Ship Force Objective
- CBO Estimate of Combat Logistics Force Requirements
- Long Term Combat Logistics Ship Building Projection: 1989-1998

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- Sealift Capability and Requirements: 1987 and 2000
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- Selected Submarine Weapon Procurement Plans: 1989-1991
- Proposed Submarine and ASW RDT&E Funding: 1989-1991
- Issues Raised in Blue Ribbon Panel Report on U.S. Submarine Technology

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- Changes in Surface Combatant Force Level Objectives as a Result of Navy's Recent Requirements Study
- Long Term Combatant Force Building Projection: 1989-1998
- Composition of Future Surface Combatant Force: 1980-1998
- Selected Surface Combatant Weapon Procurement Plans: 1989-1991
- Proposed Surface Combatant RDT&E Funding: 1989-1991
- Options Proposed Which Would Slow DDG 51 Funding

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- Carrier Force Level Objective
- Issues Raised Concerning Navy's Carrier Force Level Objective

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- Amphibious Landing Craft Assault Capability: 1980 and 1990
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- Amphibious Ship Force Level Objective
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- Characteristics of Proposed TAGOS 23 SWATH Design Ocean Surveillance Ship
- Characteristics of Planned TAGS Oceanographic Survey vessels

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- Will (Can) Navy Maintain the Pace of Ship Contruction?
- What Will Happen to the Industrial Base?

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- Technology Development Will Be Given Added Emphasis

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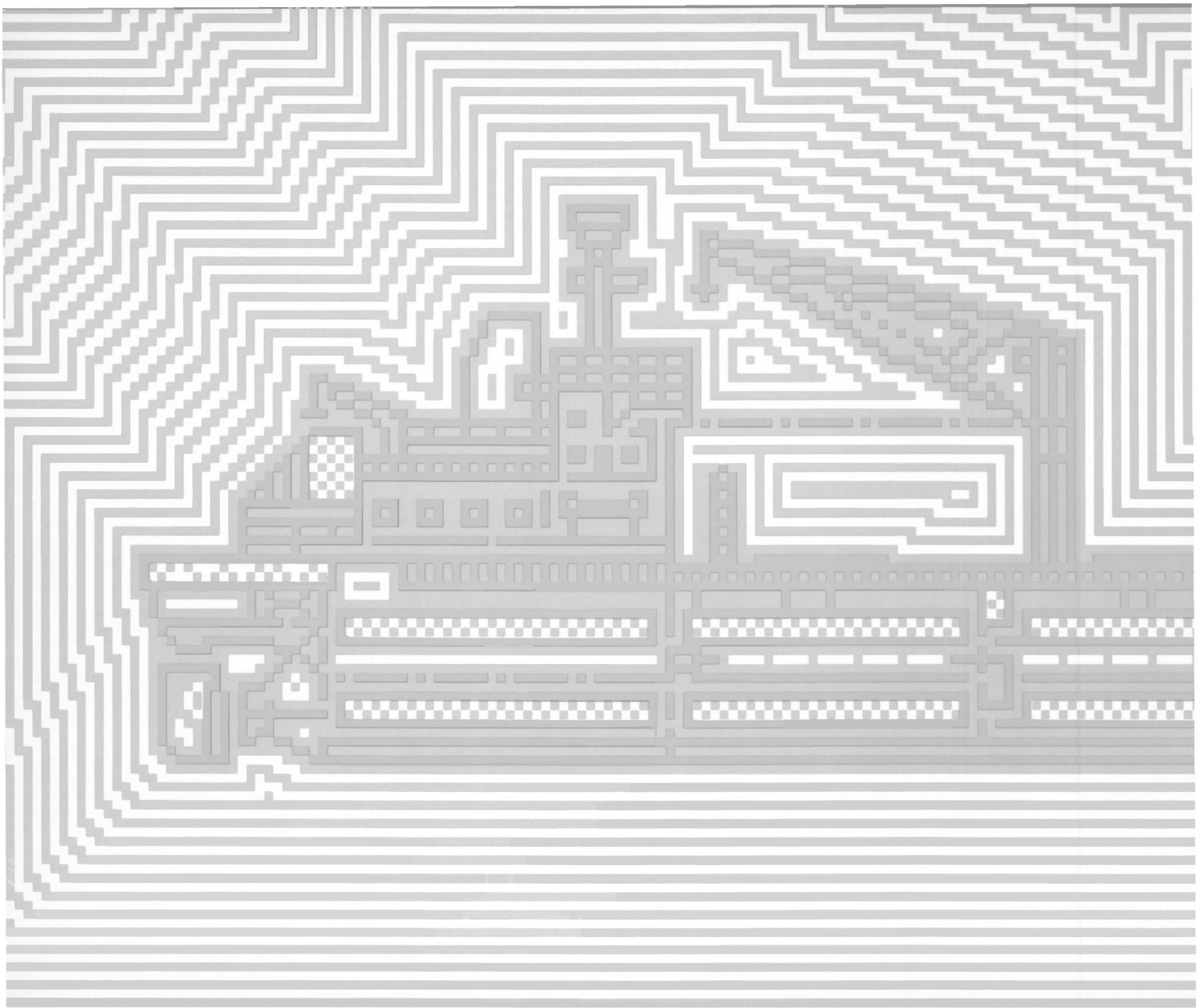

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