

**MARITIME  
REPORTER**  
AND  
ENGINEERING NEWS

# CRUISE INDUSTRY ANNUAL

*Special Focus:*  
**Satellite Communications  
Service Providers**

## **The Virtual Ship**

**3D/CAM: "Desktop shipbuilding"  
Flexibility helps yards squeeze costs**

## **Diesel Power Annual**

**Efficiency, performance  
demands drive engine  
development**

## **Profit By Compliance**

**Case study example proves waste reduction can  
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**World Shipbuilding Contracts • American Queen Sets Sail • Recent Ship Sales**

**JULY 1995**



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## ON THE COVER

The communications net satellite service providers have spun around the planet also serves a net, allowing ships to communicate from — and be contacted in — nearly any place on promoting safety and offering an unprecedented convenience at sea. A special Satellite Communications Service section starts on p. 38 (cover photo, and photo on p. 38, courtesy of St

### 28 CRUISE SHIP INDUSTRY ANNUAL:

Legislative matters on the national and international level in regards to subsidies, safety, and equipment top the agenda for cruise ship owners.



### 48 DIESEL POWER ANNUAL:

Diesel engine manufacturers are continually pressed to comply to ever-tightening environmental regulations, while increasing performance and maintaining price. In the Diesel Annual, companies report on recent progress.



### 56 CAD/CAM SYSTEMS & COMPUTER TECHNOLOGY:

CAD/CAM ship models empower shipbuilders to anticipate hurdles and streamline production, and allow shipyards a flexibility in design and production never before realized.



### ALSO IN THIS ISSUE:

- 22 EUROPEAN UPDATE:** Scottish yard RRD performs a technically demanding ship lengthening — by Carol Fulford & Andy Smith, contributing editors
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**MARITIME  
REPORTER**  
AND  
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## EDITOR'S NOTE

In a recent walk through the streets of a town near my home, I ran across this sign.

The sign, situated on a residential corner in the town of Babylon, N.Y., is a landmark I have surely passed without notice at least a dozen times before. By luck or fate, I noticed it on this day, and was

prompted to run home to get my camera, for this sign — in a way — embodies much of what the editors of Maritime Reporter & Engineering News have prepared for the July issue.

Technological advances — affecting both owners and builders — in many areas of the maritime industry over just the past decade have been astounding, to say the least. And it is the companies which embrace the cost-saving, efficiency enhancing technologies today that will be around to compete tomorrow.

Ship's communication is perhaps one of the most visible categories to identify these advances. As the sign states: "A pioneer station here in 1901 first talked with ships at sea." In a span of 94 years, ship communication technology has made quantum leaps, and today ships can communicate via voice, fax or data transmission from virtually anywhere on the earth.



What's ahead? Read our first-ever guide of satellite service providers, which starts on page 38, to find out.

On another technological front, the advent of computer aided design and computer aided manufacturing (CAD/CAM) is emerging as a primary means to enhance shipyard efficiency and advance safe ship designs. An article by Jonathan M. Ross, director of engineering, Proteus Engineering, discusses how medium and small-sized U.S. yards are following successful European examples to achieve this end. Many CAD/CAM system suppliers are rushing to fill this growing need, and the main story is followed by updates on new and improved programs.

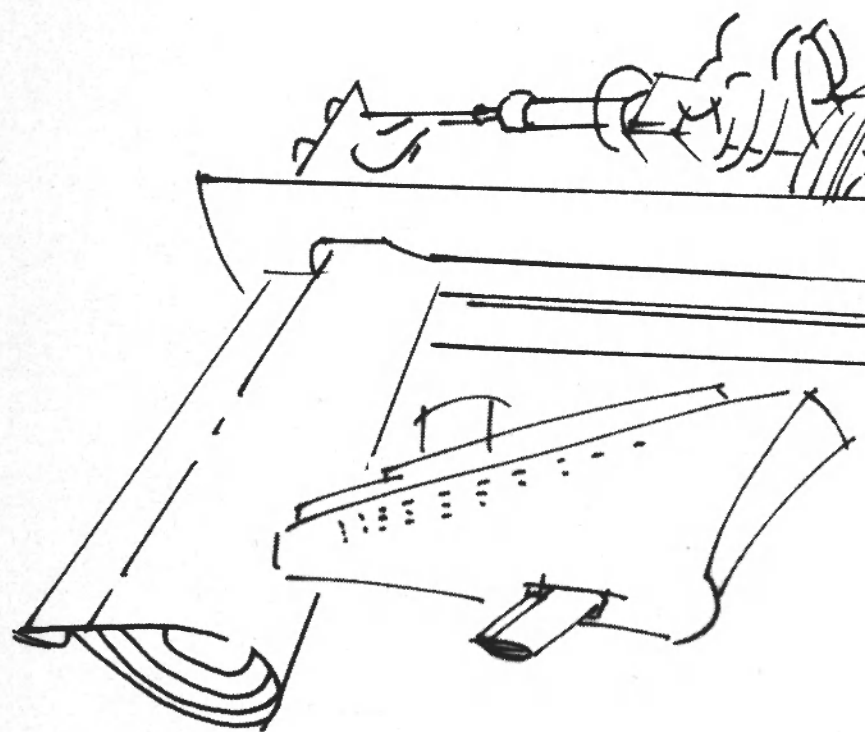
Maritime Reporter & Engineering News has a long and distinguished reputation as the primary information source to the maritime industry — an impossible feat without constant feedback from our readers. I welcome any and all comments or suggestions for future editorial coverage, and can be reached via phone, fax or mail (see page 7); or via e-mail at: SHIPWRITER@aol.com.

I look forward to hearing from you.



Greg Trauthwein, editor

## SIMPLEX-COMPACT FIN STABILIZERS



Comfort and safety demands on cruise vessels and ferries are increasing.

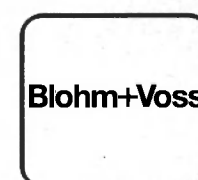
Blohm+Voss plays an important role in contributing to safety and therefore, comfort on such ships.

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118 E. 25th St.  
New York, N.Y. 10010  
tel: (212) 477-6700  
fax: (212) 254-6271

**Publishers:** Charles P. O'Malley  
John E. O'Malley  
John C. O'Malley

#### EDITORIAL

**Editorial Director:** Charles P. O'Malley  
**Editor:** Gregory R. Trauthwein  
**Senior Editor:** Don Manolis  
**Assistant Editor:** Bridget A. Murphy  
**Editorial Consultant:** James R. McCaul  
**Technical Editors:** Graeme MacLennan  
Alan Thorpe  
**Contributing Editors:** Carol Falford  
Andy Smith

#### PRODUCTION

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## Representatives

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206 South Tyler Street  
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**Scandinavia** **MR. STEPHAN R. G. ORN**  
AB Stephan R.G. Orn  
Box 184, S-27124 Ystad, Sweden  
Telephone: +46 411-18400  
Telefax: +46 411 10531

**United Kingdom** **MR. MICHAEL J. DAMSELL**  
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West Sussex RH16 1YF, ENGLAND  
Telephone: 0444 417360  
Telefax: 0444 417360

**Italy** Ediconsult Internazionale  
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**France** **MR. DANIEL SOLNICA**  
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**Korea** **MR. C.H. PARK**  
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fax: (212) 254-6271.

## Freeport Shipbuilding To Build Corps Motortender

Freeport Shipbuilding has been awarded a contract to build a 50-ft. (15.2-m) motortender for the U.S. Army Corps of Engineers. The new workboat will support various tasks associated with the Old Hickory Lock and Dam on Tennessee's Cumberland

River, located within the Corps' Nashville District. The vessel will be outfitted with twin 380-hp Caterpillar 3406-B engines and Twin Disc reverse reduction gears. Delivery is scheduled for the summer of 1996. Freeport Shipbuilding and Marine Repair builds workboats and passenger vessels.

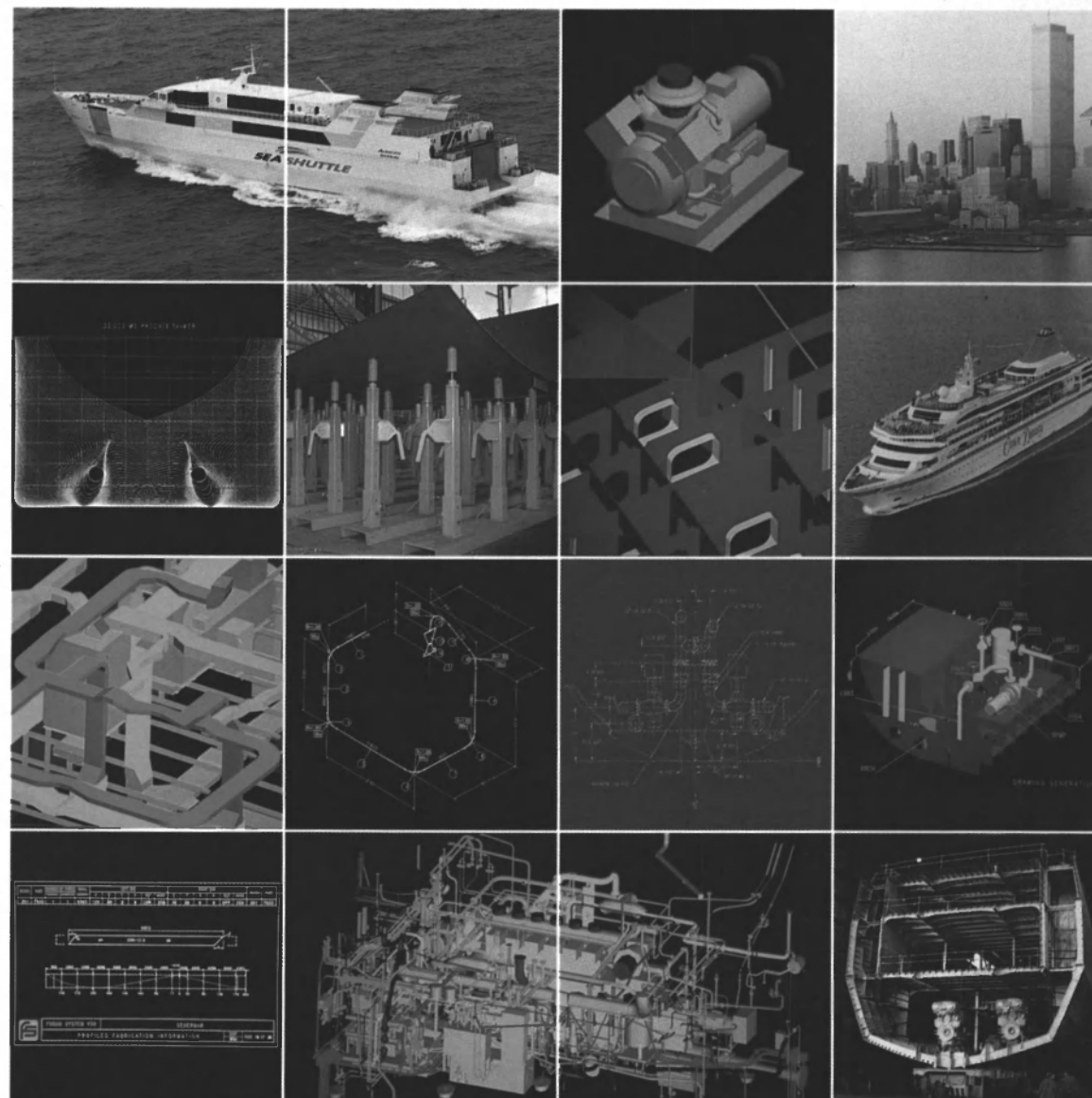
For more information on Freeport Circle 87 on Reader Service Card

## Bergan Awarded Sealift Contract

Ian-Conrad Bergan, Inc. of Gulf Breeze, Fla., has been awarded a Navy contract to supply tank level gauging equipment for the new T-AKR 300 Strategic Sealift ships currently under construction at Avondale Shipyards. The ships will

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be equipped with Bergan hydrostatic pressure transducer systems, including DMUs (Distributed Monitoring Units). Ian-Conrad Bergan, Inc. manufactures tank gauging and overflow protection equipment, as well as hydrostatic and microwave tank level gauging products. The company has reportedly sold more than 16,000 alarm units since 1980.

For more information  
Circle 88 on Reader Service Card

#### Alfa Laval To Equip Tanker Newbuildings

Alfa Laval S.A., Spain, working with Alfa Laval Venezolana S.A., Venezuela, won a major order for oil treatment, central cooling and freshwater generation systems for four tankers to be built by Astilleros Espanoles at its Sesato Shipyard in Spain for PDV Marine S.A., Venezuela. The four 47,000-dwt prod-

uct tankers, powered by AESAMAN B&W 5560 MC engines rated at 13,900 bhp, are slated for delivery in 1996 - 1997.

For more information on Alfa Laval  
Circle 90 on Reader Service Card

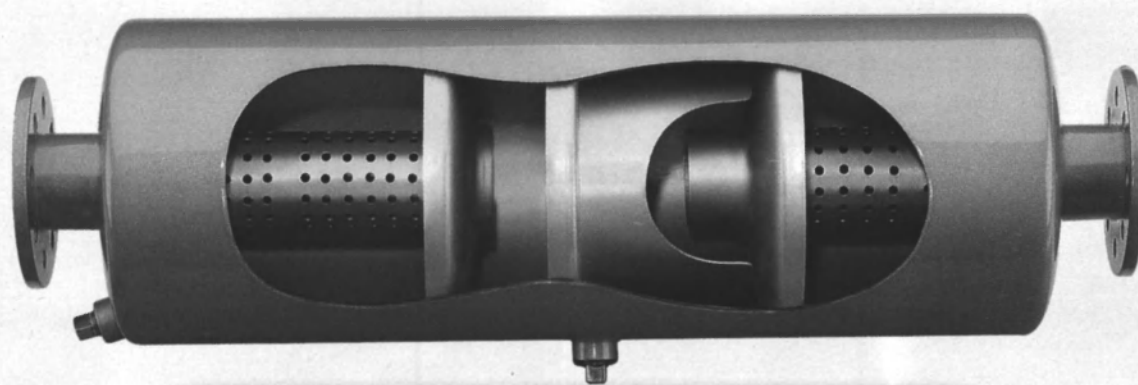
#### German Machinery Co. Adds Singapore Office

In mid-June, Hatlapa Uetersener Maschinenfabrik GmbH & Co.

opened a sales office in the German Center in Singapore. Headed by Uwe Weiland, the company's task will coordinate activities in the Asia-Pacific region. Hatlapa manufactures machinery parts for the international shipping industry, including compressors, winches and steering gears. Closer contact with customers in the Asian market will enable the company in responding more quickly to changing user requirements and market demands.

For more information on Hatlapa  
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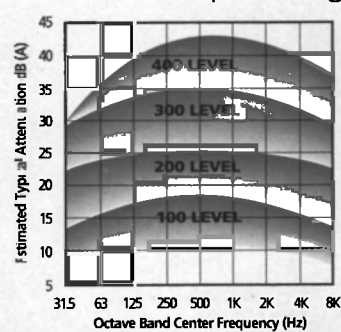
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#### VT To Provide Alarm System For Red Funnel

Vosper Thornycroft Controls Division of Vosper Thornycroft Ltd. has secured two more orders for Vicam alarm and monitoring system from Southampton, U.K.-based Red Funnel. The contracts will be for the latest Raptor class cross Solent ferry and a new tug which will join Red Funnel's towage fleet in Southampton Docks. On the tug, the Vicam system will monitor propulsion and auxiliary machine possibly including the monitoring of the towage gear for stresses. Vosper Thornycroft has reported that the Vicam system can be tailored to vessels ranging from yachts, to ULC to naval and paramilitary craft. Vicam is designed to meet the requirements of all the major classification societies and can monitor systems from 50 to 1,000 channels, with the capacity for further expansion.

For more information on  
Vosper Thornycroft, Ltd.  
Circle 93 on Reader Service Card

#### Steamers Acquires Containership For \$20 M

Steamers Maritime Holdings Ltd., a member of the Keppel Group, has acquired a containership for \$20 million. The vessel, *ACX Aster*, currently chartered by Japan shipping group Nippon Yusen Kaisha (NYK), and will continue to charter until October, with options for further extensions, trading between ports in Japan, Vietnam and Thailand. The vessel has a capacity of 923 TEUs, is equipped with 40-ton cranes and 204 reefer sets, and has a service speed of 20 knots. *ACX Aster* was sold by Columbia Shipmanagement, a German company operating from Cyprus. This is the third vessel Steamers has acquired as part of an initiative to invest in container feeder ships to trade in the charter market. Additionally, an advanced design of TEU containership is under construction at Singmarine.

#### IMO's 1992 Civil Liability Convention Protocols

The amount of compensation available to victims of oil pollution from tankers will be more than doubled following the entry into force of the 1992 Protocol to the Civil Liability Convention (CLC) and

Maritime Reporter/Engineering



1992 Protocol to the Fund Convention, scheduled to occur on May 30, 1996. Nine countries have ratified the protocols: Denmark, France, Germany, Japan, Mexico, Norway, Sweden, and the U.K. The geographic scope of the 1992 Protocols includes the exclusive economic zone (EEZ) established under the United Nations Convention on the Law of the Sea. The Protocols include a new definition of pollution damage which states that, for environmental damage, only costs incurred for reasonable measures to instate the contaminated environment are included in the concept of pollution damage. The 1992 Fund Protocol also introduces provisions setting a cap on contributions to the IOPC Fund payable by receivers in any given country.

**Lawrence Seaway Traffic Rises**

Commercial vessel transits through the two U.S. St. Lawrence Seaway locks in Massena, N.Y., surpassed last year's level through May by 29 percent, according to statistics released by the St. Lawrence Seaway Development Corporation. A total of 571 vessel transits took place at the U.S. Seneca and Snell locks between March 24 and May 31. Of those vessels, nine percent were ocean vessels, 42 percent were laker vessels, and eight were tour transits. Corporation Acting Administrator **David G. Sanders** said that the increase in vessel transits was due largely to heavy export and import steel demand.

**N Atlas Elektronik Offers Multibeam Sounder**

Fansweep 20, a portable, reporty lightweight multibeam echosounder, has been introduced by N Atlas Elektronik. The unit combines bathymetric and sidescan imaging for shallow water applications. By incorporating advanced hydroacoustic and electronic signal processing facilities, the system provides increased high-accuracy coverage of up to 12 times vertical swath, or a corresponding swath width of 190 degrees in a sidescan mode. Real-time output and display of bathymetric and sidescan data is simultaneous, with up to 40 depth and 4,096 sidescan measurements available per sweep rate of eight sweeps per second. Using either 100 or 200 kHz V-type transducers, Fansweep 20 provides a depth range of up to 1,968.4 ft. (600 m) or 984.2 ft. (300 m), respectively.

For more information on STN Atlas Circle 98 on Reader Service Card

**Simrad Secures \$17 M Contract For FPV Equipment**

Simrad has contracted to provide \$17 million worth of maritime instrumentation, process control, safety systems equipment for floating production vessel (FPV)

1995

to be used by Statoil at the Norne field in the North Sea.

The contract includes the engineering, manufacturing and commissioning of equipment for positioning, power management, cargo control, safety systems, and process control for the oil and gas production. Deliveries are scheduled to start in the fall.

For more information on Simrad Circle 92 on Reader Service Card

**Drew Offers Non-Hazardous Cargo Tank Cleaner**

Ashland Chemical's Drew Ameroid Marine Division offers a cargo tank cleaner that is reported to be non-hazardous and cost-effective. Envirocare 318 and 360 are designed to remove residues remaining in cargo tanks in order that tanks are clean enough to transport

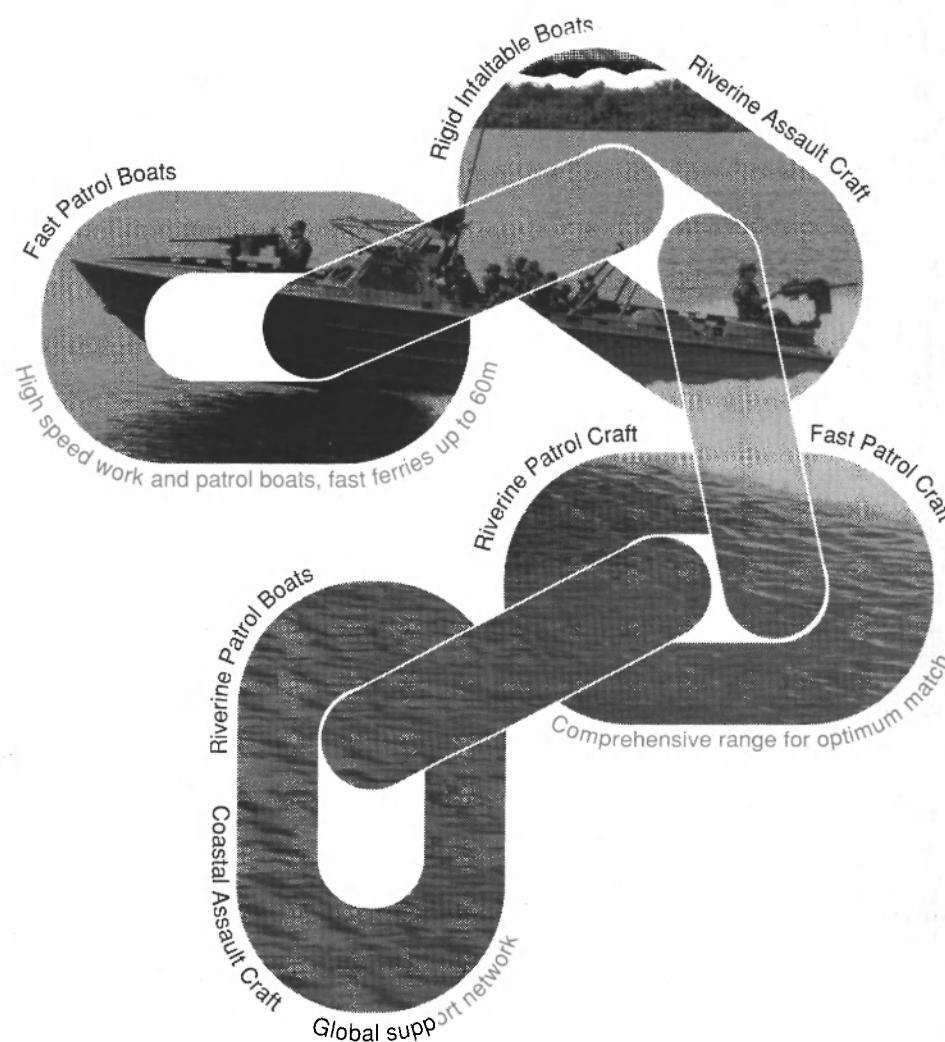
high-value cargo. Both cleaners work on complex hydrocarbon contaminants without the use of chlorinated or hydrocarbon-based solvents, and can be recycled to allow for multiple applications. The new cleaners are compatible with Butterworth or comparable mechanical spraying machines.

For more information on Drew Ameroid Marine Circle 100 on Reader Service Card

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CWF 0943

## American Queen Sets Sail



View of entrance from American Queen's bow.



Delta Queen Steamboat Co.'s new sternwheeler, American Queen, was constructed by McDermott Shipyard to the design specs of Rodney E. Lay & Associates.

The Delta Queen Steamboat Co. has christened its latest riverboat *American Queen*, an overnight passenger vessel designed by Rodney E. Lay & Associates, of Jacksonville, Fla., and constructed by McDermott Shipyard of Amelia, La.

The 418.5-ft. (127.5-m) steamboat is reportedly the largest overnight passenger vessel built in a U.S. shipyard since the 1950s, and was built at a cost of \$65 million. Unique

machinery aboard the vessel includes antique steam engines salvaged from the steam dredge *Kennedy*.

*American Queen* will cruise the inland waterways of the Mississippi River and its tributaries, and was scheduled to begin its inaugural season on June 27, with a 16-night cruise from Pittsburgh, Pa., to New Orleans, La.

For more information on McDermott Circle 54 on Reader Service Card

### American Queen Specifications

Length	418.5 ft. (127.5 m)
Width	89.3 ft. (27.21 m)
Draft	8.5 ft. (2.5 m)
Gross tonnage	3,707
Speed	10 knots
Classification	ABS Maltese Cross
	A1 Passenger River Service

### Main propulsion

Z-drives	(2) Aquamaster-Rauma
----------	----------------------

	Model US911/2250, 1,000-hp eac
Diesel generators	(3) Caterpill
	Model 3516 DITA, 1,440 kW eac
Electric motor	General Electri
	CD6770 Frame, 1,000 h

### Other Equipment

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Radar	Racal Decca M-252
Antenna	Shakespeare 399
Depth sounder	Furu
Vertical capstan	McElr
	Model MSV 125-D14
Vertical windlass	McElr
	Model MC-D14
Wind speed indicator	Sea J
	Model M50
Electric hoist	Columbia H5600 A1-
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### Safety At Sea

Rescue boat	Avon AV4
Inflatable liferafts	SMR Technolog
Marine airhorn	Kohlenberg G

### Pumps

Bilge pump	Durco 4X3US-1
Ballast pump	Durco 4X3US-1
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Reefer cooling pump	Aurora 34
Diesel oil transfer pump	Viki
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Portable pump sump	Jabsco 12210-00
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## OECD Accord On Subsidies Faces D.C. Vote

by Bridget A. Murphy, assistant editor

The future of shipbuilding in the U.S. will be influenced by an upcoming Congressional vote on a measure that, if passed, will eliminate government subsidies to shipyards, and necessitate modifications to the Title XI loan guarantee program that has been cited by many as the fuel for a rebirth of commercial shipbuilding in the U.S. The Organization for Economic Cooperation and Development (OECD) organized a world forum of shipbuilding giants last year and ratified an accord that called for worldwide elimination of government subsidies to the shipbuilding industry in order to create level ground that would foster fair competition among international yards. The U.S., Japan, the European Union and Korea were all parties to the OECD accord, and the subsidy regulation policy is scheduled to commence in 1996, pending the passage of cooperative government policy in each nation. As the U.S. government prepares to address the OECD accord, debate over subsidy elimination has come into the forefront of the nation's maritime policy.

As the debate begins to heat up in Washington, the underlying issue has become apparent, namely: Is the domestic shipbuilding industry ready to convert to commercial shipbuilding without the support of government loan guarantees, as provided by the existing provisions of Title XI? Those opposed to the OECD accord say that U.S. yards need more time, a longer "transitional phase" to convert yard production techniques from those required to build military vessels to those suited to building ships for the commercial market.

It has been estimated that close to ninety percent of the shipbuilding jobs in the U.S. are represented by six major yards, whose interests are jointly represented by the American Shipbuilding Association (ASA), the organization that broke away from the Shipbuilders Council of America (SCA) after judging that its interests were not being represented by the U.S. Trade Representative to the OECD convention. The ASA member yards are: National Steel and Shipbuilding Co., San Diego, Calif.; Newport News Shipbuilding, Newport News, Va.; Avondale Shipyards, New Orleans, La.; Ingalls Shipbuilding, Pascagoula, Miss.; Bath Iron Works, Bath, Maine; and General Dynamics' Electric Boat Division, Groton, Conn. In an interview with *MR/N*, Tom Bowler, a former Navy captain, and recently appointed head of the ASA, said, "If this agreement is signed it will be the death knell for the commercial opportunities for these six yards. This agreement would lock these shipbuilders out of the international market. Foreign shipbuilders have been

subsidized on a massive scale where we've been focusing on naval building... You can't turn off U.S. subsidies when other countries turn on the subsidy faucet at full throttle." Mr. Bowler went on to say that: "OECD will slam the door shut on

Title XI, and revert the U.S. back to old terms, erasing the first glimmer of hope for the commercial shipbuilding industry."

Some decision makers on Capitol Hill have echoed similar sentiments, including Congressman Billy

Tauzin (D-La.), who said the OECD accord will damage the U.S. industry dramatically unless there are comparable reductions of subsidies across the world. "If we make the unilateral step, the question is, will they follow?" asked Congressman



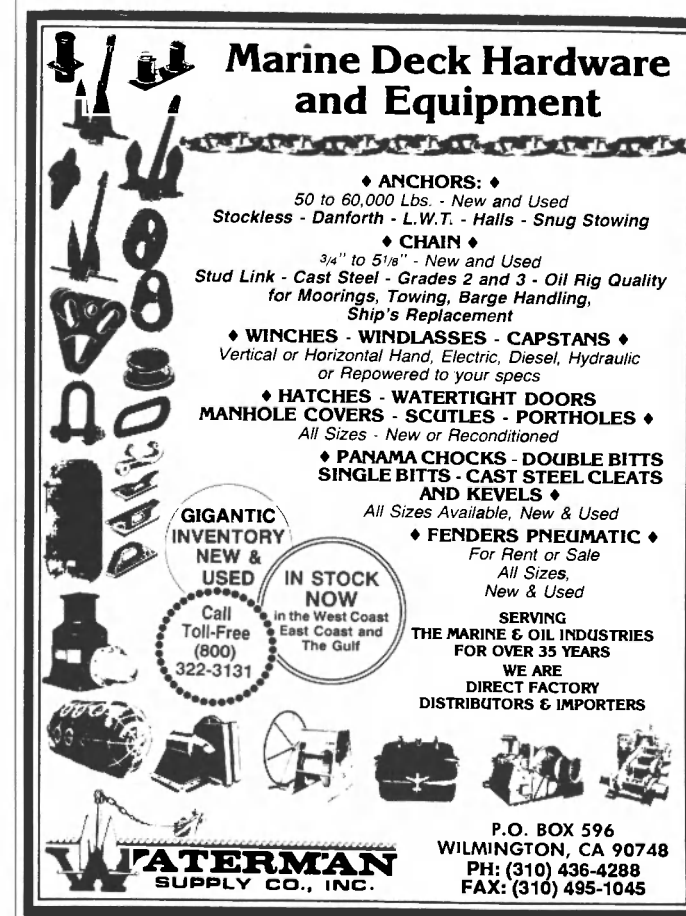
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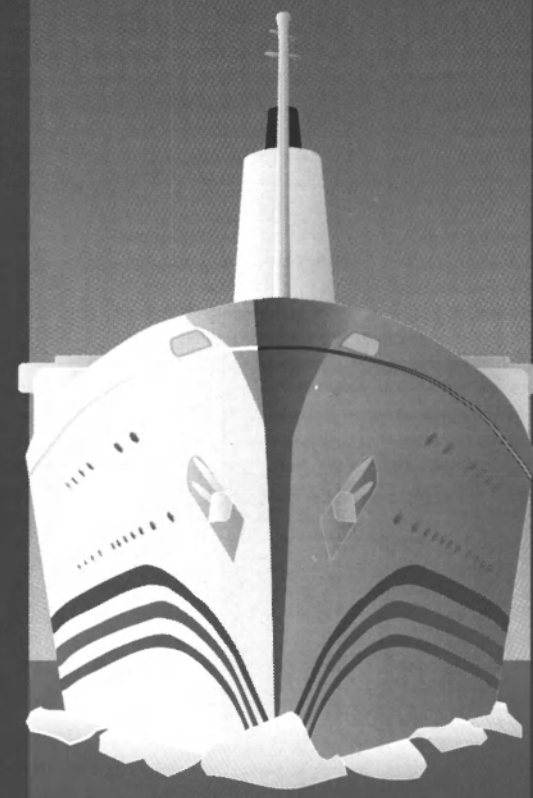
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**Tauzin.** According to him, the U.S. cannot compete in every market, and while the U.S. must continue to strive for a level playing field over the long haul, for the time being the nation should figure out the markets in which it has an advantage, and compete there. Congressman **Tauzin** compared the OECD agreement with the Cold War arms race, saying that foreign countries will not abide by a unilateral agreement

until they see that it is to their advantage to do so.

According to reports at press time, legislation concerning the OECD subsidy elimination agreement was scheduled to be introduced to Washington in the last week of June. While some politicians have issued statements of support for or against OECD, some lawmakers such as Senator **John Breaux** (D-La.) have issued statements detailing their

general position on the issue, also saying that the proposed implementations of the legislation will impact their consideration. As reported by Senator **Breaux's** office, he is generally in support of OECD, and holds that while the scaling back of Title XI would be a loss, it would be an acceptable price to pay for the advantages associated with the elimination of international subsidy practices and dumping practices,

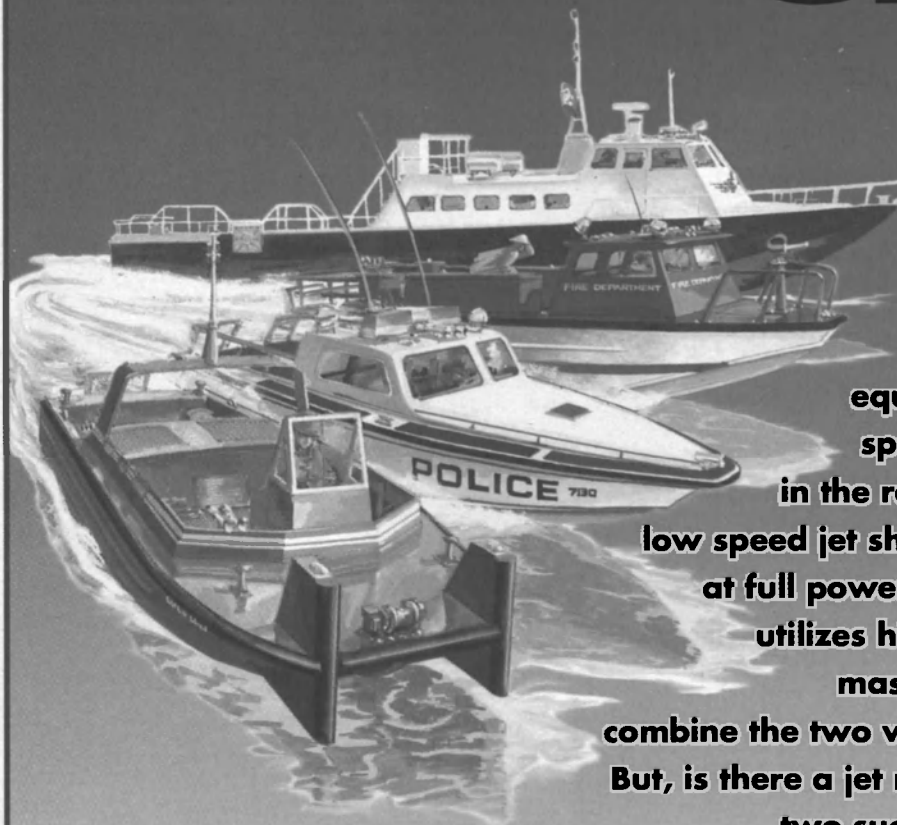
whereby countries sell vessels at a loss to sustain market shares.

Congressman **Owen Pickett** (Va.) discussed the terms of the OECD agreement, commenting, "Success (of OECD) will be determined on how well it is enforced and police. There has to be a way to make sure there are no violations of the spirit or intent." Congressman **Pickett** explained that the strength of the OECD agreement lies in the fact that it is designed to operate on a prospective basis, meaning that existing subsidy programs are phased out as they die naturally, with the introduction of no new subsidy programs.

According to **Tom Jones**, chairman of SCA, vice president of Atlantic Marine Holding Company, an proponent of OECD subsidy elimination, the modification of Title would not harm the U.S. shipbuilding industry, since the sacrifice of five to 11 percent financing would be matched by a reduction of nine to 3 percent in foreign yards. "We're giving up relatively little in the way of subsidies we get," said Mr. **Jones**. He pointed out that the U.S. has already captured orders with the aid of modest subsidies, and concluded that if foreign subsidies were diminished, the U.S. industry would have the opportunity to flourish, in the meantime "creating ten of thousands of jobs in the shipbuilding and allied industries."

Mr. **Jones** responded negatively to the idea of extending a transitional period for yard support, instead proposing, in Mr. **Jones's** words, "a significant transition program at no cost to the government, that would also not violate the OECD agreement." He contended that creating legislation to speed progress with which shippers are required to comply with OPA 9 standards, the U.S. government would create business for U.S. yards in the form of retrofit work for conversion of single-hulled ships. In return for replacing tonnage prior deadline, shippers would be given reduction in liability for spills.

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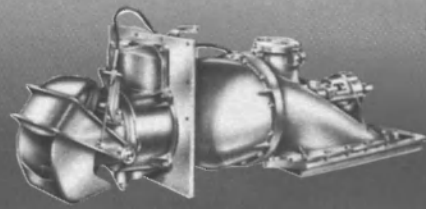
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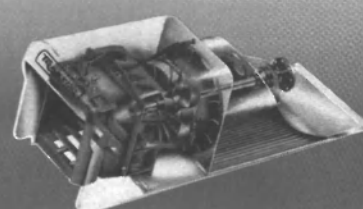
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## MarAd News

### APPLICATIONS RECEIVED

• Ilyon Investment, Ltd., Salem, Ore., has asked permission from MarAd to transfer to Russian registry the fishing vessels *Miss Michele* and the *Shady Lady*. The vessels were built 1985 and 1989 in Seattle. MarAd's permission is required under section 9 of the Shipping Act, 1916, as amended.

• Shano International Inc., Great Falls, Va., has asked permission to sell the 83,659-dwt tanker *Liberty Belle* Nicksens Exports Pvt., Ltd., an Indian corporation, for scrapping in India. The vessel was built in 1976 in Bombay, India.

• Fortune Maritime Inc., Oyster Bay, N.Y., has asked permission to sell and transfer to Bahamian registry the 39,827-d bulk carrier *Ultrasea*. The proposed purchaser is Octav Holdings S.A., Republic of Panama. The vessel was built 1974 in San Diego. If approved, the carrier would operate in the worldwide foreign market bulk trades.

• Sealift Bulkers Inc., Oyster Bay, N.Y., has asked permission

sell and transfer to Bahamian registry the 14,192-dwt bulk carrier *Inger* to Octavia Holdings S.A., Republic of Panama. The vessel was built in 1945 in Chester, Pa. The vessel is scheduled to be scrapped in July or August 1995.

MarAd has received an application from World City America Inc., New York, N.Y., for a Title XI guarantee to aid financing the construction of one 250,000-gt, 6,200-passenger ship. The proposed builder is American Flagship Construction Consortium, c/o Centex Rooney Construction Co., Ft. Lauderdale, Fla. The vessel is scheduled to be delivered in December 1998. The estimated guarantee amount is for \$1,067,000,000 of the total estimated actual cost of \$1,219,428,500, with a loan term of 25 years.

MarAd has received an application from Compagnie Industrielle de Navigation S.A.M., Monte Carlo, Monaco, for a Title XI guarantee to aid in financing the construction of two 500-dwt RoRo vessels. The shipbuilder is Dakota Creek Industries, Inc., Anacortes, Wash. The vessels are scheduled to be delivered in September 1997 and March 1998. The estimated guarantee amount is for \$72,275,000 (36,137,500 per vessel) of the total estimated actual cost of \$82,600,000 (\$41,300,000 per vessel), with a loan term of 25 years.

#### APPLICATIONS APPROVED

MarAd has given approval to Alan L. Moore & Associates New Orleans to sell the 1,174-gt barge *Sea Piper* to Scler, C.A., a Venezuelan corporation. The barge will be transferred to Venezuelan registry. The barge was built in 1977 in Belle River, La.

MarAd and the Maritime Subsidy Board have approved a request from Lykes Bros. Steamship Co., Inc., to terminate its final subsidized voyages of the *Margaret Lykes* and *Arlette Lykes* in Karachi, Pakistan. The vessels are scheduled to be sold on an as-is/where-is basis due to market conditions.

Western Overseas, Inc., Sylvania, Ohio, has received permission to sell the 11,891-gt cargo vessel *John Lykes*, 10,954-gt *Louise Lykes*, and the 11,891-gt *Ashley Lykes* to Ruby Enterprises, Inc., a British corporation. The vessels will be resold to Sanjay Steel Corporation, Kamdar Associates, and to Gupta Steel, all Indian partnerships. All the vessels will be transferred to St. Vincent and the Grenadines registry, for scrapping in India. The vessels were built in 1960, 1965 and 1963, respectively.

Neptune International, Inc., Elk Grove Village, Ill., has received approval to sell the 10,723-gt cargo vessel *Genevieve Lykes* to Neter Navigation, S.A., for resale to a Steel, an Indian partnership, for scrapping in India. The vessel was built in 1968.

Global Mobile Offshore, Inc., Lafayette, La., has been given permission to sell and transfer to Vanuatu registry the 87-gt derrick barge *Movable DB 2*. The purchaser is Global International Vessels, Ltd., a Cayman Islands corporation. The vessel was built in 1969.

Western Overseas, Inc., Sylvania, Ohio, has been given approval to sell the 11,891-gt cargo vessel *James Lykes* to Ruby Enterprises, Inc., a British Virgin Islands corporation. The vessel will be resold to Krishna Steel Rolling Mills Unit 2 (Ship Breaking), an Indian corporation, for scrapping in India. The vessel was built in 1960.

Global Marine Australia Inc., Houston, has received approval to sell and transfer to Liberian registry the mobile offshore drilling unit *Glamor Main Pass III*. The purchaser is Redrill 88, Inc., a Delaware corporation, which will be owned by Dual Holding, Inc., also a Delaware corporation, but not a citizen of the United States within the meaning of section 2 of the Shipping Act, 1916, as amended. The 4,580-gt unit was built in 1982.

Treasure Prospect AS, a Norwegian corporation, has been

given approval to transfer ownership of the Bahamian drilling rig *Treasure Prospect* (ex-*Penrod 76*) to Wilrig International AS, also a Norwegian corporation, without change in the Bahamian registry.

Dual 92, Inc., a Delaware corporation, has received approval to transfer 51 percent interest in the ownership of the Liberian drilling rig *Dual Rig 92* (ex-*Vanguard II*) to Sime Darby Drilling SMD. BHD., a Malaysian corporation, without change in the Liberian registry.

Barge Lakewood, Inc., Grosse Ile, Mich., has been given

approval to sell the 4,402-gt cargo barge *Lakewood* to International Marine Salvage Inc., a Canadian corporation, for scrapping in Canada. The vessel was built in 1903 in Chicago.

#### MarAd Opens Florida Office

MarAd opened a marketing office in Miami, Fla., to enhance its communications with U.S. ocean carriers,

exporters and importers. The new office is intended to improve MarAd's service to importers and exporters throughout Florida and to encourage the use of U.S. vessels. Patricia Burke has been named MarAd's trade specialist for Florida. Prior to joining MarAd, she was the Port of Tampa's deputy port director for marketing services and also is experienced in sales and marketing with American carriers. The office is located in the U.S. Coast Guard Build-

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### MarAd Offers Vessel Data

The complete card file of the U.S. Vessel Status Cards maintained by the MarAd is now available via CD ROM. The file, which includes over 9,600 vessels, dates prior to 1920.

The cards include the vessel name, official number, type, deadweight tonnage, gross tons, hull no., net tons, as well as the dates and names of operators, renaming, and other information. CDs are available for \$100 each.

For information, contact: **Robert L. Brown**, Division of Statistical Analysis, Room 8107, 400 7th Street, S.W., Washington, D.C. 20590, tel: (202) 366-2267.

### Libra To Spend \$330M On Ships

The Libra Group, a Brazilian transportation corporation, announced plans to spend \$330 million on a six-ship newbuilding project. Three 2,300-TEU containerships will be put in the service of Nacional Line, a unit of Libra operating in the U.S. Atlantic and Gulf, Mexico, Argentina and

Brazil trades. The other three will be 1,600-TEU capacity ships and will be put into separate service, two dedicated to Libra's operation between Brazil and the west coast of South America, and the third assigned to another Libra unit, Paulista, a carrier offering full container service between Brazil and Mediterranean ports. The vessels will be built in Brazil by Industria Verolme-Ishibras (IVI) and will fly the Brazilian flag. Construction is to begin shortly, with delivery to be effected before the end of 1997, with the remaining five to be completed in tandem thereafter.

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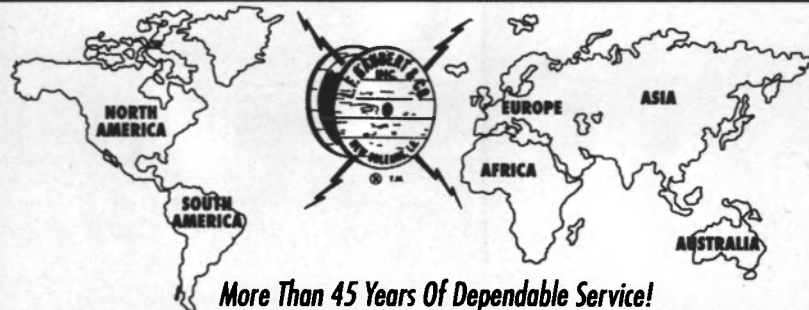


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### NNS In Computerized Ship Design Project Deal

A six-company team — including Newport News Shipbuilding (NNS), Intergraph, Bath Iron Works, General Dynamics Electric Boat Div., Ingalls Shipbuilding, and Advanced Management Catalyst, a business consulting agency at the University of Michigan — has been chosen to receive a U.S. government grant that is geared to revolutionize the design and construction of ships through the use of shared computer information. The project was awarded under a shared cost arrangement with the Advanced Research Project Agency (ARPA).

The team will use the grant to implement what is known as Standards for the Exchange of Product Model Data (STEP). Once implemented, STEP that will enable complete exchanges of digital ship computer models between companies using different computer modeling systems, helping to reduce costs and increase efficiencies.

"When the shipyard needed equipment to meet design requirements STEP would allow it to transfer data directly to the suppliers. The resulting equipment design, cost and delivery schedule would be transferred back to the shipyard and loaded into the ship design. This process would be accomplished in less time and with less human error than the current paper-based process," said **David Wooley**, engineering supervisor at NNS. NNS also received funds under the ARPA program for the design of a new, market-driven, cost-competitive LNG ship. The proposed funding, subject to negotiation, is \$7.85 million for that project. **Ed Waryas**, director, commercial marketing, cites this award as a key element of NNS's strategy to expand into the international shipbuilding market.

For more information from NNS  
Circle 153 on Reader Service Card

### Bowler Named President Of ASA

**R.T.E. "Tom" Bowler III** has been named president of the American Shipbuilding Association (ASA). The ASA, comprised of six of the nation's largest shipbuilders, was recently formed to promote the U.S. shipbuilding industry. **Mr. Bowler** is a former Navy captain who, prior to

Maritime Reporter/Engineering News

retirement June 1, served as the director of AEGIS destroyer and cruiser shipbuilding, the Navy's largest shipbuilding program.

Mr. Bowler stated, "Naval shipbuilding confronts a 'grapes of wrath' drought that will continue for the next six years, with the administration's six-year shipbuilding and conversion budget at its lowest level since 1947. The three Navy warships in the FY 96 budget represent the lowest number since 1932. This situation is the catalyst for the six largest U.S. shipyards to form the American Shipbuilding Association." The ASA was formed by Avondale Industries; Bath Iron Works; General Dynamics' Electric Boat Division; Ingalls Shipbuilding; National Steel and Shipbuilding Company; and Newport News Shipbuilding and Drydock Co.

For more information on the ASA  
Circle 149 on Reader Service Card

#### Swedish Computer Co. Forms American Subsidiary

Kockums Computer Systems AB of Sweden (KCS), manufacturer of CAD/CAM/CIM systems for the shipbuilding industry, has formed a subsidiary in Annapolis, Md. The new subsidiary will be responsible for KCS activities in North America. Bryan J. Miller, former director of governments programs, will head the Maryland operation. Holger Lund, executive vice president of KCS, explained the company's strategy, stating: "This move demonstrates that KCS is committed to the U.S. shipbuilding market, and we believe that several U.S. shipyards will become successful in commercial shipbuilding. Our customer base in North America is growing, and we are also active in the ARPA Aritech program. We formed the U.S. company to provide local support for our growing business in the American market."

For more information on KCS  
Circle 131 on Reader Service Card

#### ABB Gas Turbines To Provide Main Propulsion for Stena Ferries

ABB Stal of Sweden has received an order for the supply of four GT35 gas turbines to be used as the main propulsion machinery in two of Stena Line's new high-speed ferries, the HSS 900. The ferries will be equipped with two gas turbines, each unit developing 17 MW power or 22,000 hp. The order includes gears and ancillary equipment. According to the company, ABB's gas turbines have halved the emission levels of conventional marine diesels. In cooperation with Stena Line, ABB Stal has plans to develop gas turbines with reduction in NOx emissions of an additional 80 percent within the next few years.

For more information on ABB STAL  
Circle 134 on Reader Service Card

July, 1995

#### CAD/CAM Solutions For Newbuilding Design

Nupas Cadmatic designs shipbuilding software that integrates Computer Aided Engineering (CAE) and Computer Aided Manufacturing (CAM). The software supplies engineers with automatic drawings and detailed product information with which to structure vessels. Nupas Cadmatic combines the engineering of ship construction and generation of production information using a 3D product model of the ship. Required information such as data and weight of sections or blocks, center of gravity, parts lists, profile lists, material take off, geometry for NC cutting and bending techniques, welding shrinkage and numerical data for robots is up-to-date and online at all times.

For more information  
Circle 136 on Reader Service Card

#### Kvaerner And DuPont Join Forces On New Materials

A collaboration aimed at developing new shipbuilding and offshore applications for composite materials has been agreed to between DuPont of America and Norway's Kvaerner Group.

The first specific outcome of the agreement is likely to be subsea protective structures for the oil in-

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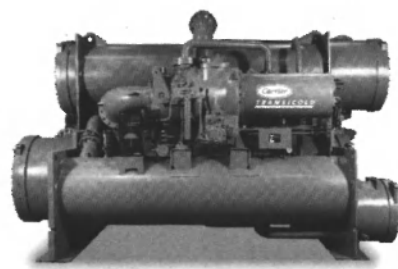
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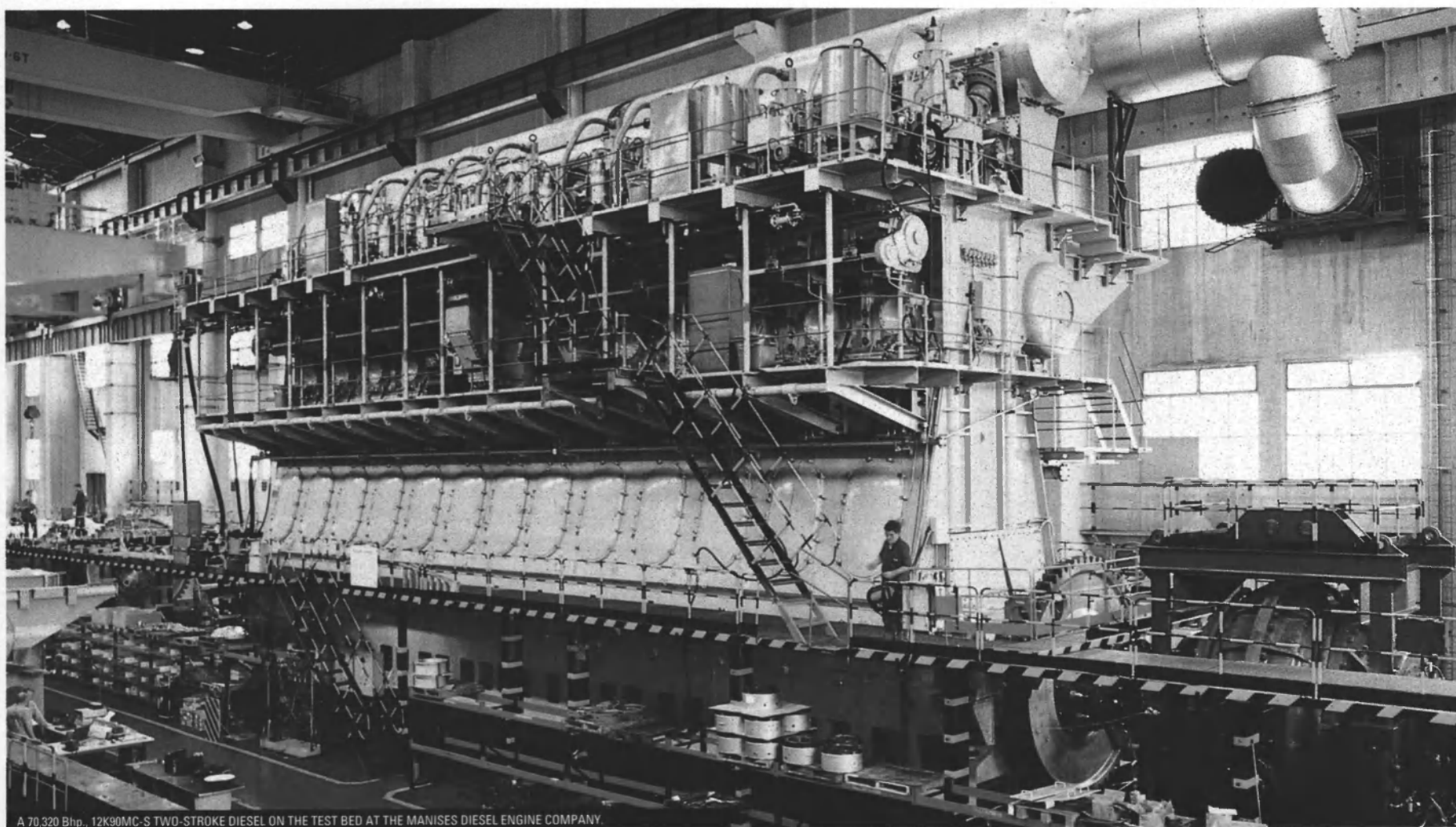
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lustry, with protection planned at the Kvaerner Mandal yard in southern Norway.

Other projects expected to get quickly underway include the development of products for oil and gas production at Kvaerner Energy — such as carbon tethers for deep water — and a study of deepwater technology by Kvaerner Engineering. In the shipbuilding sector, Kvaerner could build such units as hulls, superstructures and prefabricated cabin modules for composites.

"One of our goals is to stay among the technological leaders for key products," says Executive Vice President **Diderik Schmitler**, who heads Kvaerner Shipbuilding. "Access to the most suitable materials is a basic requirement for success in this ambition." Kvaerner's experience with composites comes primarily from the Mandal yard, which is building a series of mine countermeasure vessels for the Norwegian Navy.

DuPont has the rights to a production method that makes structures in composites both cheaper and more environment-friendly to produce, while also boosting their strength.

For more information on Kvaerner  
Circle 142 on Reader Service Card

For more information on DuPont  
Circle 143 on Reader Service Card

### Giannotti Corp. Opens New Yard In Grays Harbor

Dr. **Julio Giannotti**, CEO of the Giannotti Corp., announced the opening of the Giannotti Corporation Grays Harbor Shipyard division located in Hoquiam, Wash.

The newly-formed division will be involved in barge construction, ship repair, marine field service work, and steel fabrication. **Douglas Johnson**, most recently vice president for Giannotti's AK-WA shipyard division in Tacoma, will head the Grays Harbor operation.

The new shipyard will have full service engineering assistance from the Giannotti Engineering division, also located in Tacoma; as well as the assistance of the supervisory and administrative personnel from the AK-WA Shipyard division.

For more information on Giannotti  
Circle 147 on Reader Service Card

### Army Corps Seeks Bids To Build 45-ft. Tender

The director of the U.S. Army Corps of Engineers' Marine Design Center announced an issue of Invitation for Bids number DACW61-5-B-0063 for the design, construction, testing and delivery of a tender for use in the Chesapeake and Delaware Canal by the Philadelphia District, USACE. The vessel will be assessed by the ABS. The bid package is a "design and build" type based on a Preliminary Design prepared by the Marine Design Center.

Liquidated Damages are included in the contract and Bonding is required. The vessel will be delivered to Chesapeake City, Md. The bid package is available now for \$35 per set, and bid opening is anticipated in July-August 1995. Contact: U.S. Army Corps of Engineers, Philadelphia District, Wanamaker Building, 100 Penn Square East, Philadelphia, Pa. 19107-3391; ATTN: CENAP-CT.

### Stolt Parcel Tankers Orders 42 Sailor GMDSS Units

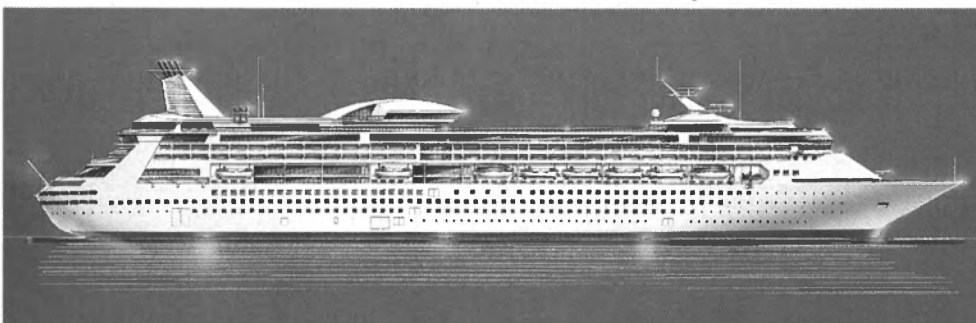
Stolt Parcel Tankers has entered into an agreement with S.P. Radio AS of Denmark, under which Stolt Parcel tankers will convert 35 ships in operation and install the Sailor GMDSS station. In addition to that, Stolt Parcel has chosen Sailor GMDSS units for seven newbuilding 37,000-dwt parcel

tankers under construction at Danyard. Stolt Parcel will also get the Sailor GMDSS PC Simulator for all 42 vessels. With this newly developed software, training can be carried out on an ordinary PC in the same environment as the ordered Sailor GMDSS stations. The program fully imitates the operation of all components of the Sailor compact GMDSS station.

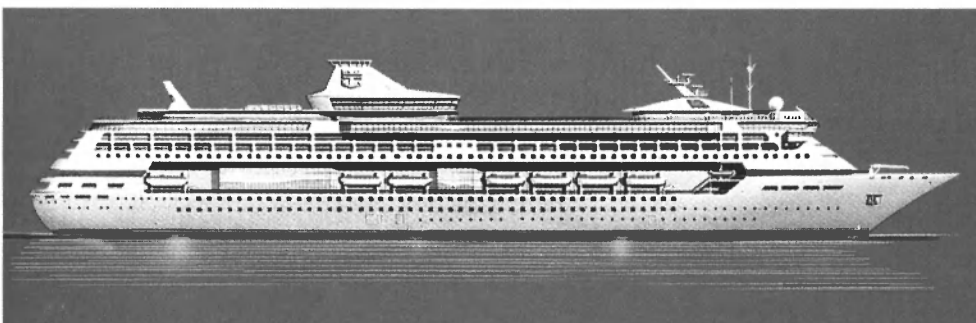
For more information on Sailor  
Circle 144 on Reader Service Card

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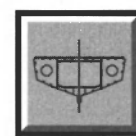


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**NC-Pyros** is a NC-code generator for burning featuring automatic path connection, leads and interference check.



### General HydroStatics (GHS)

from Creative Systems, Inc.

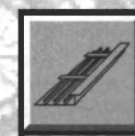
Widely recognized as the most advanced and productive trim/stability/strength software. Specialized versions are available for ship operators, for salvage engineers and for small craft designers. Includes efficient modeling for all types of complex vessels, and the ability to analyze them both afloat and aground.



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Circle 283 on Reader Service Card

**ES Delivers Vessels,  
Receives Order**



The 135,000-cu.-m. LNG carrier *Ghansha*.

Mitsui Engineering & Shipbuilding Co., Ltd. (MES) has recently delivered an oil tanker, *London Glory*, to London and Overseas Freighters Limited, and an LNG carrier, *Ghansha*, to Ghashi Inc. The oil tanker is the fifth double hull Suezmax type tanker built by MES, a sister to the *London Pride*, delivered in July 1993. *Ghansha* is the third LNG of a four-vessel series being built by MES for the transport of liquefied natural gas from Abu Dhabi to Japan.

MES was also recently awarded an order for a set of educational/training equipment for the Surabaya Rating School in Indonesia. The order was placed by the Directorate General of Sea Communication of the Indonesian Ministry of Communications through the Tomen Corporation. The project is financed under the Japanese government's official development assistance scheme, and served by the Overseas Shipbuilding Cooperation Center of Japan as consultant. The Surabaya Rating School is one of Indonesia's core schools for training ratings and coasting officers. MES will provide the following equipment: navigation aids; survival training equipment; firefighting equipment; deck department equipment; engine department equipment; as well as other teaching aids.

For more information on MES  
Circle 138 on Reader Service Card

**DMI Norshipco USA Offers  
Complete Diesel Services**

Norshipco has joined forces with Diesel Marine International Ltd. (DMI) in order to create a full-service diesel facility in Norfolk, Va., known as DMI Norshipco USA. Norshipco's investment in an autonomous machine shop/diesel reconditioning facility has been combined with DMI's technological experience and fully trained diesel service mechanics. The facility is equipped with a complete rotary yard chromium plating system and computerized Numerical Control (CNC) machinery. High speed reurfacing is achieved by plasma transfer arc welding and submerged arc welding systems. The joint venture aims to provide quality service at competitive prices for U.S. customers.

For more information on  
DMI Norshipco USA  
Circle 137 on Reader Service Card

**PBI Delivers Boom-Handling  
Boats; Offers Sturgeon Bay  
Yard For Sale**

Peterson Builders, Inc. (PBI) recently delivered four 24-ft. (7.3-m), aluminum-hulled boom handling boats (BHBs) to the Naval Sea Systems Command of the U.S. Navy. These pollution control craft represent a new market segment for PBI.

PBI is presently completing the construction of the 42-ft. (12.8 m) aluminum PCC patrol craft and recently delivered 11 glass-reinforced plastic (GRP) LCPLs. Both of these projects were also contracted for by the Naval Sea Systems Command.

PBI has been actively engaged in the construction of patrol craft for the U.S. Navy and international customers for many years. PBI has designs for patrol craft ranging from 26 ft. (8 m) to 187 ft. (57 m) in length,

having hulls constructed of aluminum, steel or GRP, with speeds in excess of 50 knots.

PBI recently announced that the shipyard in Sturgeon Bay, Wis., is being offered for sale, and that the owners are willing to consider joint ventures, partnerships and other business opportunities to utilize the facilities and workforce.

PBI will complete all work presently in process or under contract at the Sturgeon Bay facility.



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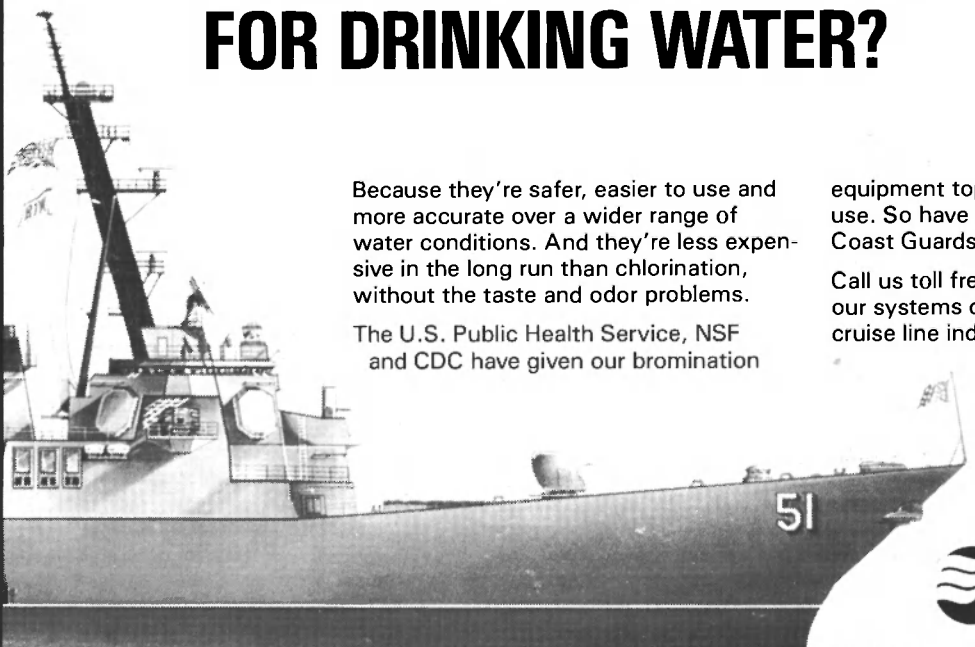
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July, 1995

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PBI also announced that a shipbuilding backlog will not be pursued, but that other opportunities will be pursued and considered. PBI will maintain its other lines of business, including its ship repair facility in Ingleside, Texas, its procurement and logistics operation in Virginia Beach, Va., and Sturgeon Bay, as well as the Quarterdeck Marina in Sturgeon Bay. Its calibration facility in Sturgeon Bay will also be retained.

For more information on PBI  
Circle 140 on Reader Service Card

### Recent Ship Sales

This report, compiled by Shipping Intelligence, Inc., a New York consulting firm, tracks sale prices of secondhand bulk carriers and tankers. (Prices are in millions \$).

Date	Vessel Name	Type	DWT	Year Built	Price
6/12	Paragon	Bulkcar	17,622	73	2.5
5/22	Felicity	Bulkcar	18,157	72	2.1
6/5	Jin An	Bulkcar	19,920	76	3.7
6/12	Areni	Bulkcar	22,626	73	2.7
6/12	Annapol Glory	Bulkcar	22,670	74	2.9
5/22	Rete Fortune	Bulkcar	23,750	76	5
6/12	Fernando Pessoa	Bulkcar	26,463	76	4.7
5/30	Ranger	Bulkcar	26,600	76	4.2
6/12	Cedar Forest	Bulkcar	27,939	89	15.5
6/5	Hulktra	Bulkcar	28,317	76	5.5
5/16	Ocean Bridge	Bulkcar	28,489	80	7.6
5/22	Nicola D	Bulkcar	32,280	71	1.8
4/5	Tamara	Bulkcar	32,505	76	4.1
5/22	Panormos	Bulkcar	34,478	78	7
5/22	World Marine	Bulkcar	37,402	73	3.5
5/30	Great Pearl	Bulkcar	37,415	82	13
6/5	Roc Sao	Bulkcar	38,173	80	8.8
6/5	Western Sun	Bulkcar	38,340	86	15.4
5/22	Fernando	Bulkcar	38,923	77	7.7
4/5	Texas City	Bulkcar	43,579	81	12.5
6/5	Skaustrand	Bulkcar	43,815	94	26.5
5/30	Ludiano Della Gatta	Bulkcar	54,019	74	4.5
5/22	Allegro F	Bulkcar	54,455	74	5
5/22	Frenzy	Bulkcar	68,499	72	2.2
5/22	Po Tok	Bulkcar	68,676	89	20
6/5	Eston Breeze	Bulkcar	69,203	83	14
6/12	Jalovihar	Bulkcar	78,538	76	4.3
5/18	Damodar Krishna	Bulkcar	78,917	75	4.5
5/22	Depe Giulia	Bulkcar	80,205	73	2.6
5/30	Strigilla	Bulkcar	81,881	74	2.8
5/22	Accord Express	Tanker	19,991	85	8.3
5/30	Leticia	Tanker	24,155	83	8.7
5/18	Lisbet	Tanker	28,610	90	16
6/12	Hawk	Tanker	29,775	92	19.2
5/30	Wewason Hawk	Tanker	29,775	92	18.5
5/30	Agio Ravenna	Tanker	29,892	75	3.5
5/30	Rossi	Tanker	29,900	78	12
5/30	Sierwepel	Tanker	29,900	82	12
5/30	Parieta	Tanker	32,389	78	3.3
5/22	Novo Europa	Tanker	54,999	75	5.25
5/22	Tomis Liberty	Tanker	86,810	81	11.8
6/5	Nila	Tanker	88,565	81	13
5/30	Lark Loka	Tanker	90,916	91	27
5/22	Boymen	Tanker	136,960	76	8.5

For more information, contact: Shipping Intelligence, Inc., 25 West 43rd St., New York, N.Y. 10036, tel: (212) 991-0966

### O'Boyle Joins Keppel Marine Agencies

Richard F. O'Boyle has joined Keppel Marine Agencies, Inc. as vice president - New Jersey Operations. Keppel Marine Agencies represent various shipyards worldwide. Mr. O'Boyle has over 30 years of experience in the marine industry, most of which was in technical sales, marketing and management. His most recent focus has been the rep

Maritime Reporter/Engineering News

resentation of shipyards. Mr. O'Boyle will continue to represent North Florida shipyards, which his firm has represented since 1979.

For more information on Keppel  
Circle 145 on Reader Service Card

#### French Yard Adopts FORAN CAD/CAM Program

French shipbuilder Societe Nouvelle des Ateliers et Chantiers de l'Atlantique du Havre (ACH) has chosen FORAN, the integrated CAD/CAM system developed by Sener Ingenieria y Sistemas of Spain, as its system for ship design and production. The new version of FORAN, FORAN 30, was launched on the market at the beginning of 1993 and has so far been adopted by 31 shipyards. At ACH, the system will be applied for the first time to the production of three double-hulled 37,000-dwt chemical carriers for Stolt Parcel Tankers of Norway. ACH started its evaluations of CAD/CAM software in 1994. The contract between ACH and Sener for FORAN covers the complete scope of FORAN and includes training and technical assistance both in Spain and France.

For more information on Sener  
Circle 141 on Reader Service Card

#### Wheeler Appointed Agent for 15 Chinese Yards

Wesley D. Wheeler, president of Wheeler Associates, announced the signing of an exclusive agreement with SMIEC — Shanghai Machinery Import & Export Corporation — to represent the company in the U.S. for repairs and conversions and other areas where there is no agent. The yards involved are Cheng Xi, Donghai, Haihua, Hudong, Jiangnan, Lifeng, Lixin, Minnan, Nantong, Quixin, Shanghai Fishing, Shanghai Ocean, Shanghai, Shenjia and Zonghua.

The largest drydock is 885.8 x 157.5 x 54.8 ft. (270 x 48 x 16.7 m), at Nantong on the Yangtze River, with a lifting capacity of 36,000 tons or about 150,000 dwt. The smallest drydock is 262.5 x 40 x 16.4 ft. (80 x 12.2 x 5 m) at Donghai on the Huangpu River with a lifting capacity of about 1,000 dwt. Some of the yards are engaged in newbuilding. The Yangtze and Huangpu Rivers are entered directly from the East China Sea. The major service agencies are within the adjacent Shanghai and Jiangsu provinces, including Sulzer, Sabroe, Hagglunds, ABB, Krupp Atlas, Nakashima Propeller, Vorcontrol, ECO, etc. Among others Wheeler Associates represents Blohm + Voss, Germany; Astander, Spain; and Dakar Marine, Senegal.

For more information  
Circle 146 on Reader Service Card

#### Midland Systems Given FM, CSA Intrinsically Safe Stamp

Midland Manufacturing Company, manufacturers of vapor recovery and alarm systems for the marine industry, announced that its full line of alarm systems has been certified as intrinsically safe in both the U.S. and Canada by Factory Mutual (FM) and the Canadian Standards Association (CSA). According to Gaston Barmore, director of technical service, Midland systems have been approved as intrinsically safe in several Canadian installations through either on-site

inspections or through acceptance of U.S.-based FM certification, without retesting, by the CSA.

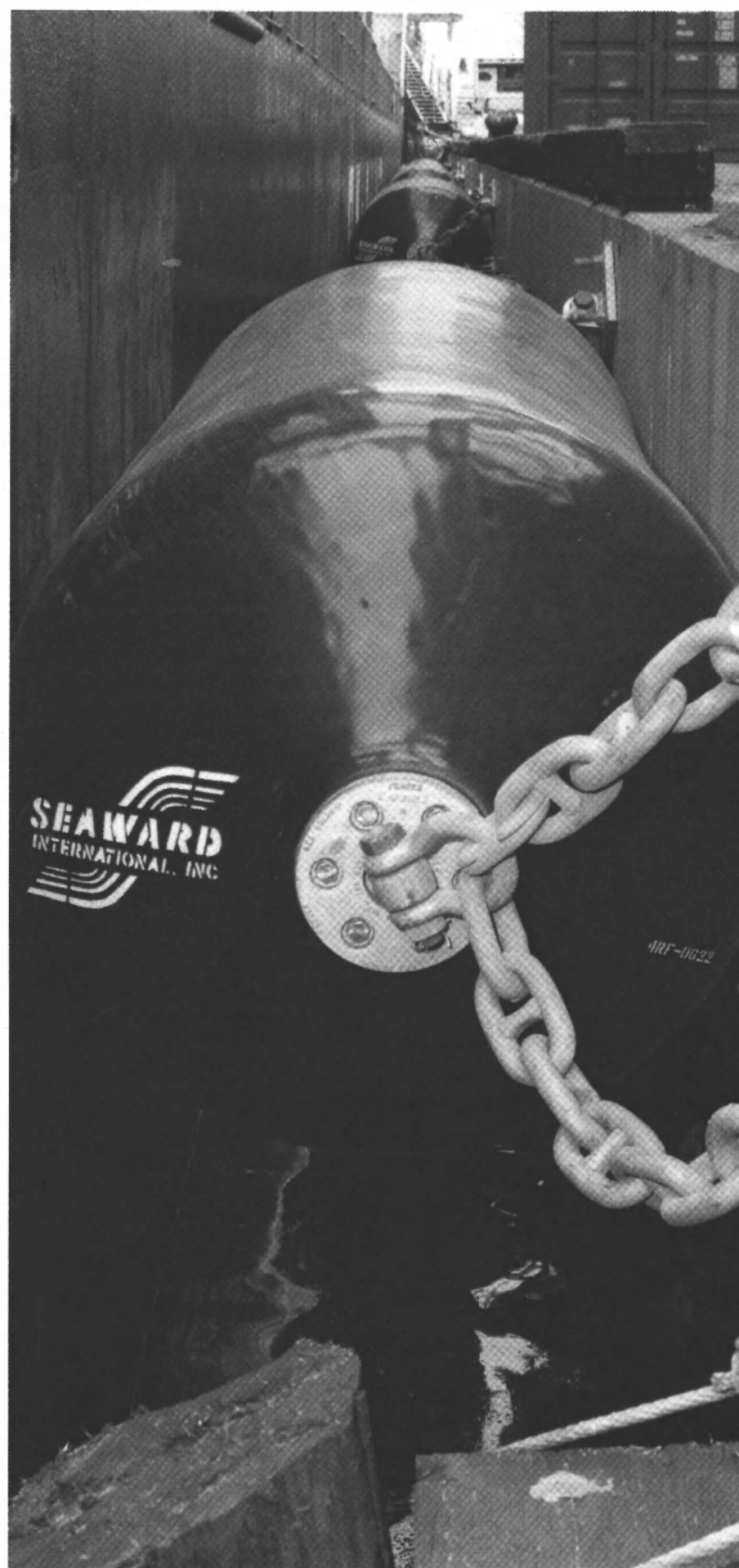
For more information on Midland Mfg.  
Circle 148 on Reader Service Card

#### PPI Releases Two New Separators

PPI has released two new machines in its Solid Bowl range of

separators. The SB-1200 and SB-1300 represent further improvements in separation technology with increased capacity and greater efficiency. These machines represent the culmination of 10 years of research and development, and were displayed at the recent Nor-Shipping. PPI offers a brochure with full technical details.

For more information on PPI  
Circle 150 on Reader Service Card



Circle 219 on Reader Service Card

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## EUROPEAN UPDATE

# Scotland's RRD Performs Technically Demanding Ship Stretch

by Carol Fulford and Andy Smith, contributing editors

The U.K. Navy's Royal Fleet Auxiliary landing ship (LSL), *Sir Bedivere*, is now fully afloat after having its hull stretched in a technically demanding procedure at Scotland's Rosyth Royal Dockyard (RRD). As a result, the ship—featuring two new midship sections—is 43-ft. (13-m) longer. Work has begun on her new superstructure, main engines and power generators, electrical systems and accommodation spaces.

Described as one of the most complete reconstructions of a naval vessel ever carried out in Britain, the contract is a first for the yard in terms of the sheer scale of work.

The 21-month contract has a value of \$68 million. An option for similar work on two sister ships—*Sir Geraint* and *Sir Percivale*—brings the total potential value to more than \$208 million.

Allan Smith, chairman of Babcock Rosyth Defence Ltd., (BRDL) operators of RRD, said "This award clearly demonstrates the progress we have made at Rosyth towards achieving our objective of being the U.K.'s premier ship refit facility for defense vessels."

*Sir Bedivere* arrived at RRD last fall. The conversion is intended to extend her service life

by 15 years.

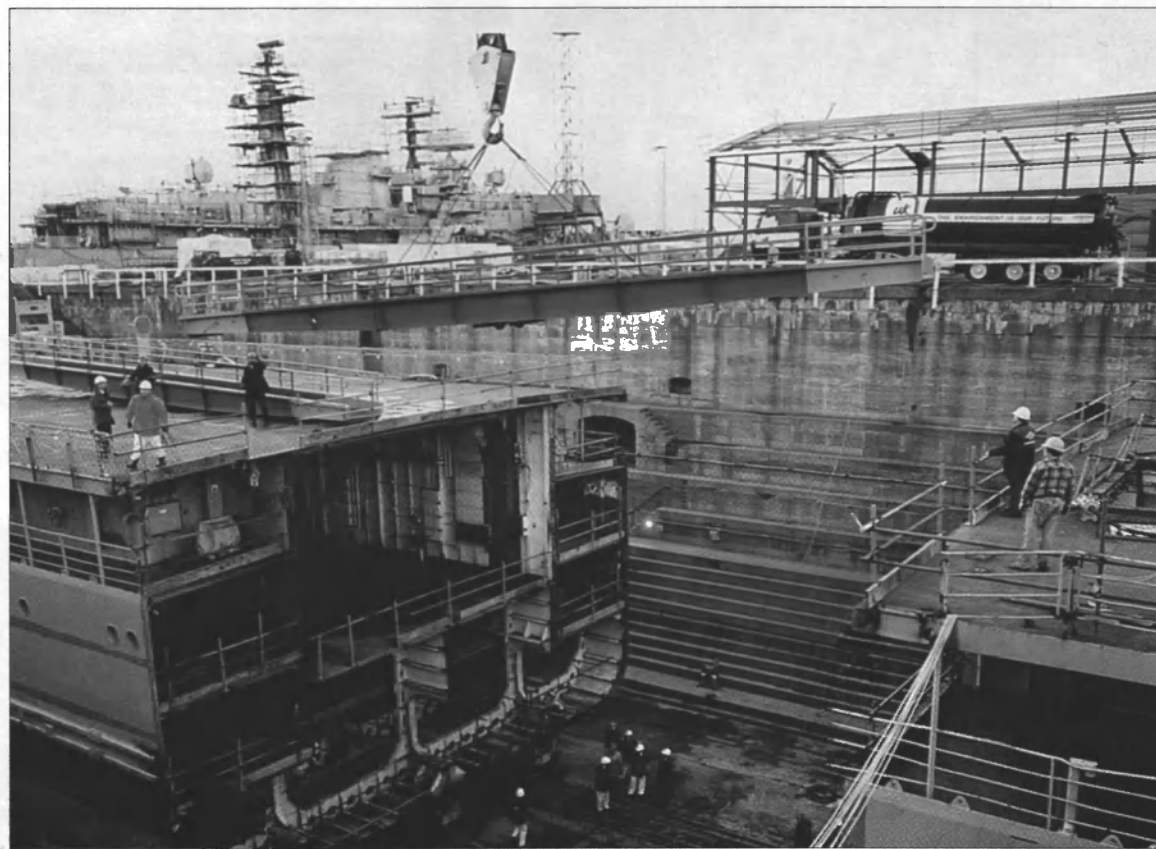
Hull separation was carried out after an initial strip-out of equipment and removal of asbestos. The cut was made midship.

Following this, construction work included replacement of about 40 percent of deck and side plating and the building of a new superstructure.

*Sir Bedivere's* vehicle and flight deck forward will be replated and strengthened in order to accommodate Chinook helicopters, while the flight deck aft—to be sited one deck lower—and the stern ramp will be replaced by a new hinged version. New EH36 steel, which is less likely to crack in cold weather, is being used to replace large parts of the outer hull.

Twin Wärtsilä 12SW280 engines with a continuous rating of 6,920 bhp/3,600 kW at 900 rpm have been installed to replace the old units. The diesels, the first Wärtsilä's believed to have been selected by the Royal Navy, are designed to greatly reduce running costs and weight.

BRDL has teamed with several specialist partners to complete the contract including experienced design experts YARD and marine planning consultants Harry Wilson Associates. *Sir Bedivere* is scheduled for completion next April.



RFA *Sir Bedivere* was cut in half at Rosyth Royal Dockyard in December as part of the Ship Life Extension program.

## Norwegian yards benefit from Ulstein designs

Norway's Ulstein International has been closely linked with the offshore industry since oil was first discovered in the North Sea. This close relationship is maintained with orders being placed at west coast Norwegian shipyards for no less than seven platform supply vessels, all to Ulstein UT700 Series designs.

A UT745 design is under construction at Simek in Flekkefjord, ordered by Solstad Shipping for delivery next May. This brings the number of UT745 vessels built or on order to eleven since the first of this new generation design, *Maersk Frontier*, was delivered from Ulstein Verft to Danish owner AP Møller in June 1992.

Brattvaag is to build a high-capacity UT746, and a UT750 will be built at the Fosen yard. Four UT755 vessels are to be shared equally between the Brattvaag and Soviknes shipyards. Options have also been placed for an additional two UT755 vessels and another UT750.

Essentially the UT746 is a larger version of the 745, according to Kjetil Leine, project manager in the design department at Ulstein International, but incorporates a number of detailed refinements and improved features. This version has been ordered by Remoy Shipping against a 12 year charter—with an additional six year

(See "Ulstein" on page 23)

## Fast ferry package

*Sea Shuttle 1* is not just an interesting foil assisted catamaran fast passenger vessel, is but part of a complete fast ferry package offered by Competitive Concepts (Europe) Ltd. which includes route assessment, design and build, finance, and operation management.

The vessel is a 74-ft. x 23.6-ft. (22.5-m x 7.2-m) asymmetrical catamaran with the hulls linked by two fixed hydrofoils, one located just forward of amidships and the other right aft. Powered by a pair of 1,100-hp MWM V16 diesels driving Hamilton 422 waterjets via Reintjes gearboxes, 103 passengers can be carried at speeds approaching 30 knots with a reportedly superior ride.

(See "Ferry Package" on page 27)

## Triple success at U.K. yards

Three successful small workboat builders in the U.K. have made headlines over the past month with special news and deliveries: Souter Shipyard has delivered its second production 44 ft. (13.4-m) Nelson 44 catamaran; Berthon Boat Co. delivered the first production Severn Class lifeboat to the RNLI; and Cornish yard Poole Isaac started an alliance with Canadian company Tamarine.

Souter's delivery of *Yantlet* to the Port of London Authority's hydrographic survey team was timed to coincide with a major diving project in hand on the River Thames. A high-tech replacement for the aging *Havengore*, *Yantlet* offers a high level of crew comfort, generous space due to broad beam and the inherent stability.

(See "U.K. Yards" on page 27)

Maritime Reporter/Engineering News

## EUROPEAN UPDATE

"Ulstein" continued from page 22)

option — to provide support duties for Statoil. Extra cargo space on the UT746 has been made possible by increasing overall length from 270-t. (82.5-m) to 287-ft. (87.7-m) and increasing the molded depth. Other improvements — provided by the deeper hull form and addition of a fully plated cargo rail — include a revised cargo deck, increased tank capacity and a better working deck environment. New larger, circular mud tanks have been added without internal stiffening, making the cleaning process much easier. Both methanol and fuel capacities have also risen significantly.

Particular attention has been given to the accommodation and heelhouse areas. The twin funnel arrangement on the earlier design has been dropped in favor of a single casing, offset to port. This modification has improved wheelhouse visibility as well as reduced the effect of casing penetrations through the accommodation structure. The air-conditioning plant is relocated below wheelhouse level, and to improve the crew's comfort and recreation, the mess deck has been raised from the main deck to A-deck level.

Revisions have been made to the propulsion and thruster arrangement, but follow Ulstein's proven win-shaft practice of locating the two main engines well forward, just aft of the accommodation block, driving aft-mounted gearboxes via long intermediate shafts. The system is designed to minimize the problems of trunking exhaust gases away from the working deck area, and releases the high volume parallel mid-body or cargo tank capacity and an uncluttered working deck.

Installed power will be raised from 2,650 kW to 3,245 kW by the fitting of eight-cylinder Ulstein Bergen RM engines in place of the previous six-cylinder units. To accommodate the extra power and provide improved fuel efficiency, larger 11.5-t. (3.5-m) diameter propeller units are specified. As with the UT745, the controllable pitch propellers are driven via two-speed gearboxes. To compensate for the larger vessel size, the aft side thruster has been increased in size to 1,000 hp. The hull lines, particularly aft, have been optimized for higher speeds and lower resistance than traditional PSVs. Consequently, the fuel economy of the UT746 and the overall propulsive efficiency are greatly improved.

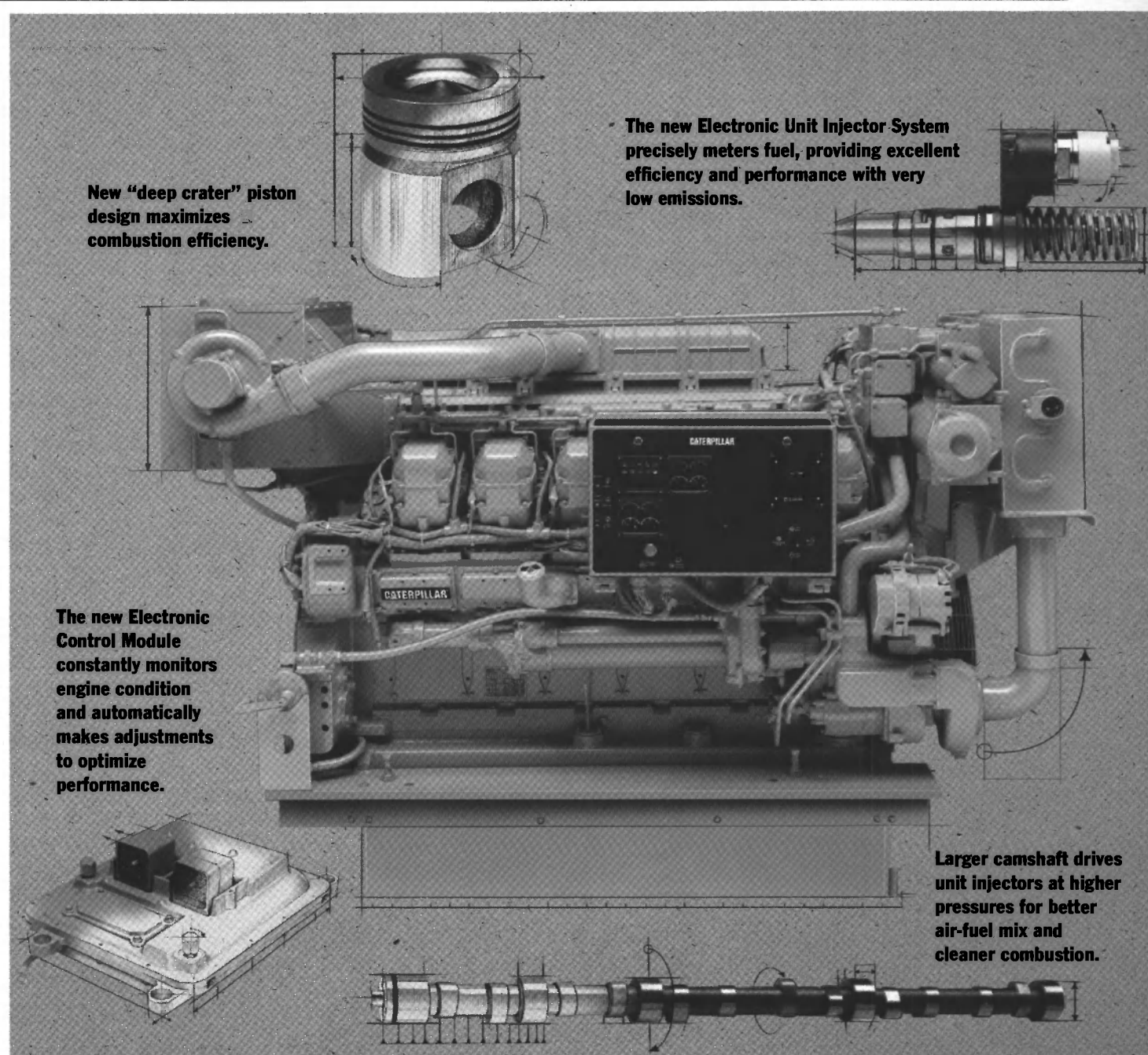
By contrast, the four UT755 ships to be built are a new design developed as a cost-effective solution to current routine and projected offshore requirements. Although smaller than the other vessels (220-t. (67-m)), they will still have impressive tank capacities — 800-cu.-ft. of mud and 400-cu.-m. of brine.

Brattvaag will build a pair of vessels for Gulf Oil U.K., while the Soviknes contract is with a division of Britannia Marine, which holds

options for an additional two identical vessels. The UT755 is designed to satisfy industry requirements at the lower end of the market, with interest coming from the Far East, Gulf of Mexico and those operating in the marginal fields of the U.K. North Sea sector. According to Karl

Johan Bakken, vice president of Ulstein International, this new design offers the market a competitively priced vessel with compact dimensions but with an excellent cargo balance and capacity. The cargo deck area measures 620-sq.-m. and the ship's total deadweight

capacity is 2,150 tons. Completing the current order intake is the UT750 — another refinement of the UT745 — ordered by Farstad Shipping. The contract, with an option for another vessel, brings the number of vessels built for Farstad by Ulstein, or to Ulstein designs, to 17.



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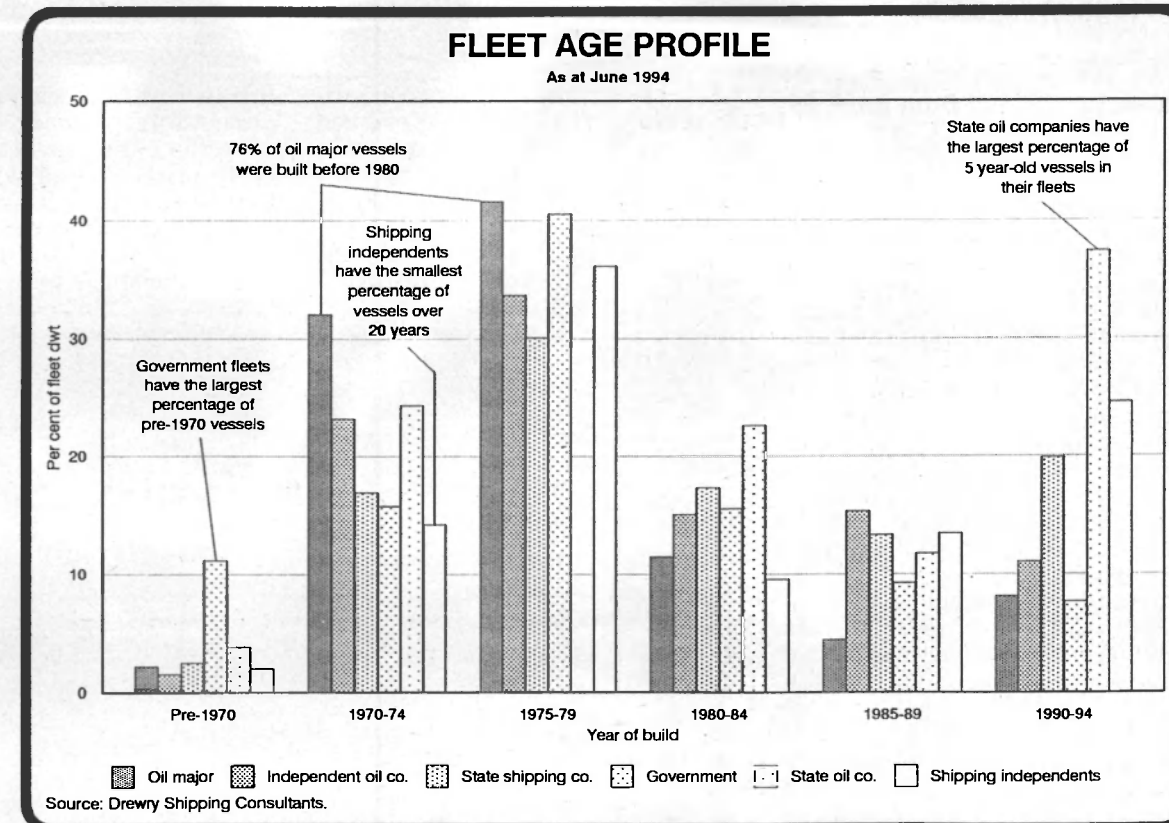
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# The Evolving Tanker Market

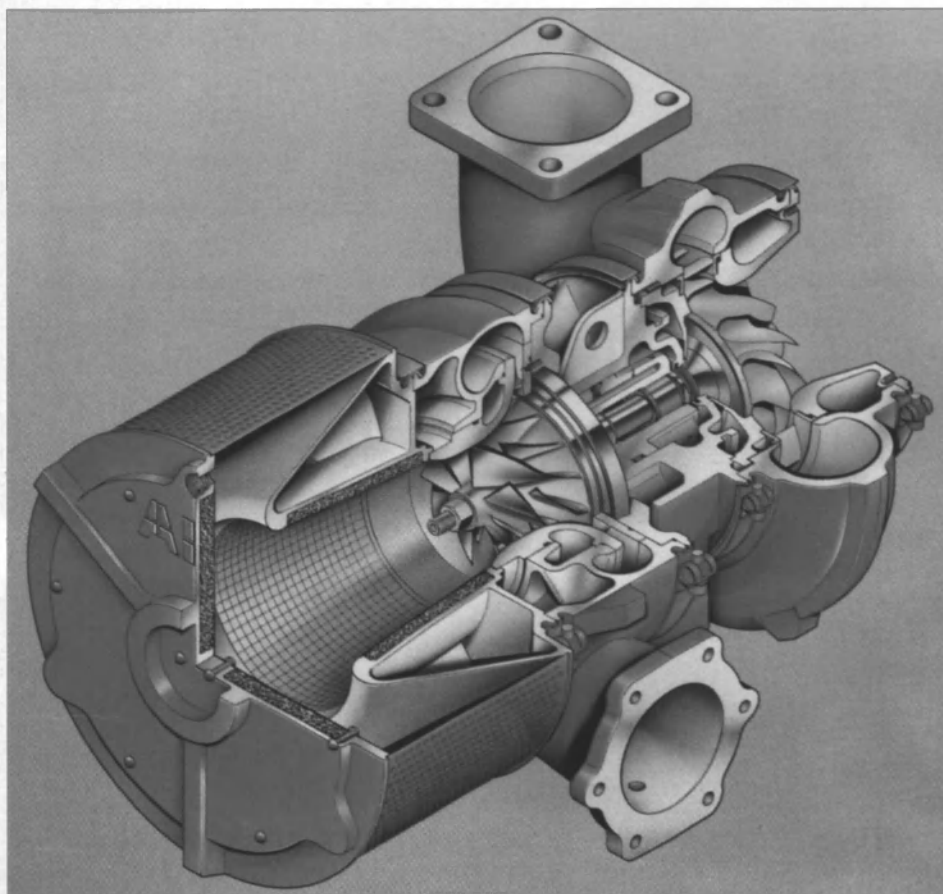
Twenty years ago the seven oil majors owned outright a quarter of the world's tanker tonnage, and at the same time controlled an additional 50 percent through long-term time charter commitments. Today, they own less than nine percent, and have little tonnage on long-term charter. This represents a massive structural change for the oil tanker fleet. The impact on ownership, chartering and operating policies is detailed and analyzed in a 198-page report from Drewry Shipping Consultants entitled *The Oil Tanker Fleets*. Faced with the continued poor profitability of shipping and demands for higher safety standards, oil majors have conducted a thorough review of their attitude towards shipowning and operating in the 1990s. The relationship of shipping independents and oil majors is now at a turning point, the report concludes. The average age of their fleets ranges up to 20 years, but all fleets contain tonnage which will need to be renewed in the near future. With crude oil demand forecast to increase gradually to the end of the millennium and the oil majors continuing to deplete their owned fleets, both the size and market share of



the independent shipowners looks set to increase even more. However, many owners' resources have been depleted by the decline in the underlying value of their assets by weak trading returns from the spot market. This is evident from the downturn in new orders and fierce competition from charters. The big question to be answered is: how many shipping independents can continue to survive in an industry that has proved almost incapable of producing returns from trading over the past 20 years? The report concludes that if the cream of the shipping independents are unable to negotiate good long-term charter contracts, then their compatriots will

continue to suffer at the hands of the spot market. The eventual outcome of BP's well-publicized proposal to time-charter newbuild Suezmax tankers is a case in point. It is to be hoped that independent shipowners have learned a lesson from the last cyclical peak. Low second-hand values allowed conventional industry wisdom to be: buy vessels cheaply, watch asset values and earnings will take off. Middle-age tonnage was being sold at inflated prices in hope that it would be around long enough to benefit from an improvement in industry fortunes.

For more information on the Drewry report  
Circle 9 on Reader Service Card



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## PROPULSION UPDATE

*ABB Turbo Systems takes market challenges in stride with an invigorated focus on customers and new product introductions*

by Greg Trauthwein, editor

Serving the needs of two distinct customer bases in an ever-evolving market is an unenviable task. For ABB Turbo Systems of Baden, Switzerland, it's business as usual.

While attending the 21st Congress of CIMAC, Georg Clauss, marketing manager for ABB Turbo Systems, talked about the changing dynamics of the maritime industry,

The TPS 50 is the first in a new series of turbochargers. The unit was designed with increased pressure ratios at high efficiency levels, with a compact design in mind.

and how ABB Turbo Systems is positioned to meet customer need within those dynamics.

### The Market

Two groups, engine builders and vessel owners, are the target markets for new ABB turbocharger and after-sales service. For the content of this article, Mr. Clauss focused on new turbocharger sales.

While the maritime market conditions are fairly standard Business 101 fare — increased focus on reducing price, increasing quality and cost-efficiencies — ABB's size and flexibility have allowed it to answer

Maritime Reporter/Engineering News



## ABB Turbo Systems takes market challenges

challenges in a swift and definitive manner.

Traditionally, engine manufacturers have been ABB's primary target for new turbocharger sales. In the last decade, there has been a concentration and consolidation in the engine building market, and manufacturers such as ABB have had to refocus as a result. Price, always a considerable factor, has increased in importance. This is because shipyards are pressing — and being pressed upon — for better prices, and technology advantages in the turbocharger segment have somewhat leveled — equalizing the market players' positions.

### The Response

Market changes necessitated a change by ABB, and the company has responded with a new focus on the end user, a new production strategy and a new product. "We are providing comprehensive services to the vessel owners who have ABB turbochargers running," said Mr. Claus. "Today we can relieve the operator of having to keep stock of spare parts, of monitoring the running hours for preventative maintenance and assist him in case of troubles without having inspected the turbocharger first. ABB has invested a lot in improving its worldwide service organization, comprised of a globally accessible turbocharger database and a network of spare parts centers. To ensure that ABB continues to manufacture quality turbochargers in the most cost-efficient manner, the company is in the process of implementing a new production philosophy."

The conventional production lines are broken down to production islands, a process which shifts the delegation of responsibility from single managers to teams. The goal of the system is to reduce production time, improve quality and improve flexibility, keeping product lines relevant to market needs.

The flexibility factor cannot be overstated. Mr. Claus said customers can — and have — changed turbo specifications at the last minute, requiring perhaps the complete change of a small part. The ability to make these changes in a timely and cost-effective manner is crucial to continued business success.

Finally, the recent development and introduction of the new TPS 50 small turbocharger series is symbolic of the need to keep product lines relevant to market needs.

### Technology By Design

The first member of the TPS turbocharger family was hatched to answer current development activities in the small medium-speed and large high-speed diesel engine sector, as well as in the gas engine sector, which calls for turbocharg-

ers with a compact design, increased pressure ratios at high efficiency levels.

The TPS turbocharger is designed for ease of maintenance, and its modular design incorporates a reduced number of parts and simple

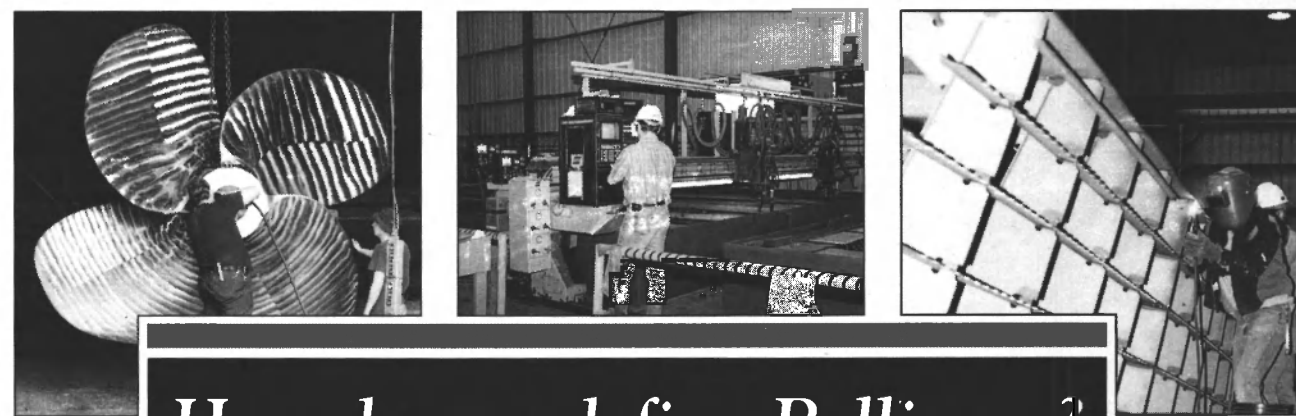
mounting.

The TPS 50 is available with two different compressor stages to ensure the full ranges of pressure ratios required by the engines. One stage is designed for maximum pressure ratios of up to 3.8, and the other for maximum pressure ratios of up to 4.6.

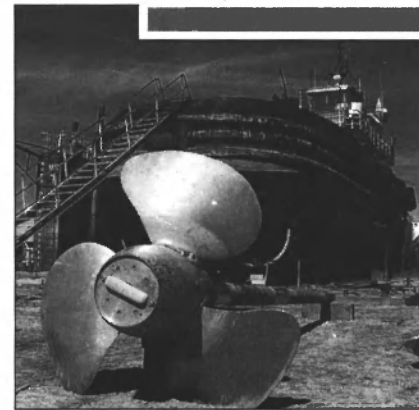
A newly developed oil-cooled bearing case is designed to allow

the component temperatures to be kept low in steady-state operation. A water-cooled bearing casing is not required, even for applications with turbine inlet temperatures of 750 degrees C. The TPS 50 covers the output range of 750 to 1,300 kW per turbocharger.

For more information on the TPS 50 from ABB  
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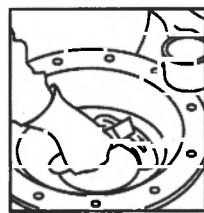
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**Goltens' Brochure Details Diesel Engine Services**

Goltens, with more than 50 years' experience in the diesel engine business, offers a 12-page color brochure detailing its wide range of services. The brochure contains information on the company's offerings, including complete diesel engine overhaul; re-engining of ser-



For a free copy of the Goltens brochure Circle 17 on Reader Service Card

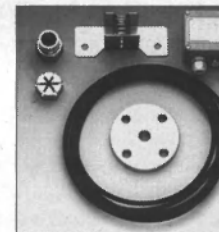
vice generators; main journal and crankpin reconditioning; centrifugal re-babbiting of bearings of all sizes; and the company's many other services.

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gauging system, specifically for use in ballast, fuel and service tank applications. The system has ABS, Lloyd's Register, DNV and other major classification society type approval.

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**Hamilton Jets Prove Effective On Mr. Mel**

Diamond Services Corp.'s *Mr. Mel*, reported on originally in the March 1995 issue of *MR/EN*, is a break from tradition of sorts for crewboats, as it features quadruple HM571 jets for propulsion. Built by Swiftships, the unique vessel is used for servicing oil rigs in the Gulf of Mexico. The waterjets — each propelled by Detroit Diesel 12V-92TA DDEC diesel engines and controlled by Hamilton Jet DECS electronic controls — provide the 142-ft. (43-m) vessel with a normal-load speed of 28 knots. The Hamilton Jet installation has no exposed underwater appendages, minimizing damage to the propulsion system from debris and floating ropes.

For more information from Hamilton Jet Circle 19 on Reader Service Card

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**SEM Offers Ultrasonic Systems For Antifouling, Tank Cleaning**

SEM-Molecular Energy System's ultrasound wave antifouling is reportedly an inexpensive and efficient means of preventing the buildup of marine vegetation on seawater cooling circuits. Seawater intakes, filters, pipes and exchangers are protected by ultrasound wave frequencies sent by small transducers applied to their surface.

The system is also touted as a means to improve combustion of diesel engines and boilers, offering advantages from reduced CO to reduced fuel consumption. No part of the system is in contact with seawater, so there are no components to be replaced periodically. Also, installation is reportedly easy and inexpensive, able to be carried out in a shipyard or by onboard personnel, with no modification required to the circuits.

For more information on the ultrasound system Circle 22 on Reader Service Card

Maritime Reporter/Engineering News

"U.K. Yards" continued from page 22)

ty of catamaran hulls.

Powered by twin Volvo Penta TAMD 72WJ diesels, each rated at 331 kW (450 hp) at 2,600 rpm driving PPI40 waterjets through Twin Disc MG 507 reversing gearboxes, she attains a top speed of almost 20 knots. To minimize noise and vibration, the main engines are flexibly mounted and have wet exhausts with GRP double chamber silencers.

Berthon also placed emphasis on crew comfort aboard *The Will*, now at her post at Stornoway lifeboat station in Outer Hebrides in preparation for lifeboat duties in severe conditions. The Severn represents a new design and construction era for the RNLI with the introduction of the very latest building materials which combine strength with relatively low weight. Built to maintain a speed of 25 knots, she also has a bowthruster fitted for low speed maneuverability. Highly complex engineering and electronic systems contribute to very strict operational safety standards allowing the vessel to self-right in the event of a capsizing.

Berthon director **Dominic May** said, "We have revelled in the challenge of combining the RNLI's design know-how with our in-house project management expertise. As a result, our highly skilled shipwrights, engineers, plumbers and electricians have built a top quality boat." The team is now completing a second Severn due for delivery at the end of the summer with two further vessels on order.

The Canadian buy-out of **Rod Baker's** yard Port Isaac Workboats has brought Mr. **Baker** a slice of a much larger boat building concern and, as he puts it, "the benefit of increased market exposure and direct investment in helping to upgrade facilities."

Port Isaac, renowned for the 35-ft. (10.5-m) and 41-ft. (12.5-m) offshore range of trihedral fishing, commercial and diving boats will now be marketed strongly in the Far East, an area where British Columbian based Tamarine has much expertise. Tamarine vice president, **Nigel Horsley** said "We have acquired 100 percent of Port Isaac Workboats but **Rod Baker** remains in charge having done a cash/share deal which gives him a share of Tamarine."

("Ferry Package" continued from page 22)

quality.

Businessman and entrepreneur **Raymond Kalley** of Competitive Concepts was the creative and financial force behind the entire project in South Africa before relocating to London. "*Sea Shuttle I* is a full working prototype which I have brought to Europe for use on real routes over extended periods to prove the potential," said Mr. **Kalley**. The craft was operated over a three month period on a 48-mile route across the Gulf of Fin-

## Norshipco Repairs Navy Swath Ahead Of Schedule

Norshipco of Norfolk, Va., won and completed a repair contract for a U.S. Navy Swath (Small Waterplane Area Twin Hull) vessel USNS *Able*, T-AGOS 20.

The Swath hull type reportedly allows the vessel to accomplish its mission under the worst of conditions.

The *Able* was awarded to Norshipco for 35 days beginning April 17. Norshipco experienced the first obstacle to the project from the start — a full drydock schedule. After careful consideration, the decision was made to drydock the *Able* in tandem with the USNS *Kanawa*.

Working closely with Tidewater Naval Architects, Norshipco developed an acceptable docking plan — and on April 20, the two vessels were drydocked as scheduled.

The drydock package for the USNS *Able* included an overhaul of the sea valves, bowthruster inspections, stern seal renewals and hull coating repairs. Working as a well-coordinated team, all shops quickly completed the work items delineated in the project plan, al-

lowing the vessel to undock three days ahead of schedule.

After successful completion of the first milestone, the next goal was to meet the vessel's dock trials scheduled to May 19. To achieve this, Norshipco would have to make extensive repairs to the lifeboat davits, 17 main deck scuttles and two

ventilation systems. Again, the shops pulled together and completed the repairs ahead of schedule, allowing dock trials to be accomplished on May 19, and allowing the vessel's departure from Norshipco two days early.

For more information on Norshipco Circle 52 on Reader Service Card



land to Tallinn in Estonia, and has just returned from a shorter exercise on the River Elbe near Hamburg. **Kalley** asserts that *Sea Shuttle* was a commercial success in both locations. It managed to draw the regular Finnish and Estonian commuters away from the existing fast ferry services, which included several Russian built hydrofoils and the Condor 9 Wavepiercer. The Elbe

venture persuaded the German authorities that a high speed service would be profitable and that erosion was not an inevitable problem as had been feared.

**Mr. Kalley** believes that fast ferries are often overly sophisticated, too expensive and frequently unsuitable for the sea conditions they may encounter. "Boat builders exert undue influence by merely offer-

ing their existing technology," he said. "Sea Shuttle can help evaluate the actual requirements during extended operations, particularly on new, as yet untried, routes. If an experiment proves successful we can help finance the whole project including the construction of a vessel of the appropriate capacity and speed, probably in a local yard, under our supervision," he added.

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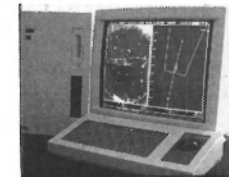
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## ICCL Faces New Challenges

by Cynthia A. Colenda, president, ICCL



Cynthia A. Colenda

Cynthia A. Colenda replaced John T. Estes as president of the International Council of Cruise Lines (ICCL) in early 1995. Most recently managing partner of Alcade & Fay, an Arlington, Va.-based government and public affairs firm which has represented the cruise industry and other maritime clients for more than 15 years, Ms. Colenda has already represented ICCL in Washington for many years. As a member of both the District of Columbia and Pennsylvania Bar Associations, Ms. Colenda holds a law degree from George Mason University in Arlington, and a bachelors in political science from Virginia Polytechnic Institute and State University in Blacksburg, Va.



While the 104th U.S. Congress ushered in the faces of a new leadership, it simultaneously changed the legislative landscape for maritime issues. In particular, we saw the elimination of the Merchant Marine and Fisheries Subcommittee, which for years maintained jurisdiction over maritime matters. Maritime issues now fall primarily within the jurisdiction of an expanded Transportation and Infrastructure Committee at its subcommittee on Coast Guard and Maritime Transportation. But the change is not merely one of form, it is one of substance as well. Just mid-way into the year, the subcommittee has offered up an agenda that includes a review of measures which would deregulate the maritime industry and modify cabotage laws.

ICCL is responding to the sweeping changes in Congress by advancing a proactive agenda. By promoting this agenda with the new congressional leadership, the administration and others, ICCL actively encourages the expanded growth of

the passenger cruise industry. The ICCL's goal remains unchanged: to ensure that all proposed legislative and regulatory actions both domestically and abroad perpetuate the free flow of our international business.

ICCL is monitoring a number of legislative issues in Congress this session. We are working with Congress to obtain a legislative clarification on the Customs User Fee imposed under NAFTA. This clarification would ensure that the \$6.50 user fee is not assessed multiple times for cruise passengers visiting Alaskan and U.S. ports more than once in a single voyage.

We are also monitoring the progress of a provision which would correct California state restrictions on gaming between two points in the state. The "Schenk" amendment would prohibit states, including California, from regulating cruise ship gaming on voyages to another state or nation if the ship reaches the other state or nation within three days. We continue to follow the issue with interest.

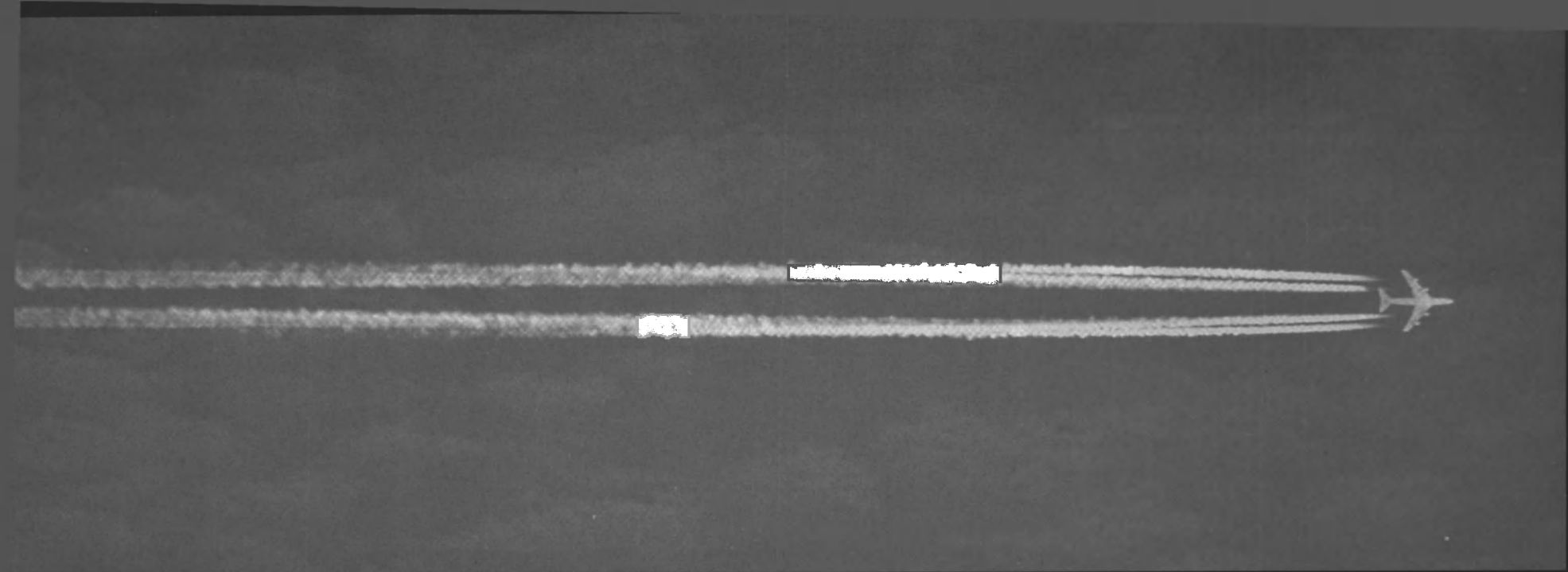
In regard to maritime reform efforts, ICCL is keeping tabs on the movement of legislation which provides for the continuation of the Operating Differential Subsidy (ODS) program for cargo vessels as well as new subsidies for U.S. shipbuilding interests. We are interested in ensuring that no fees are imposed on the cruise industry to help fund these ship operating or shipbuilding subsidy programs.

Legislation which attempted to do just that was successfully stopped last year by Sen. Larry Pressler (R-S.D.) because of its controversial funding mechanism — the tonnage tax on commercial vessels. Sen. Pressler is now chairman of the Commerce Committee and has continued his opposition to the tonnage tax as a funding mechanism to pay for these maritime programs.

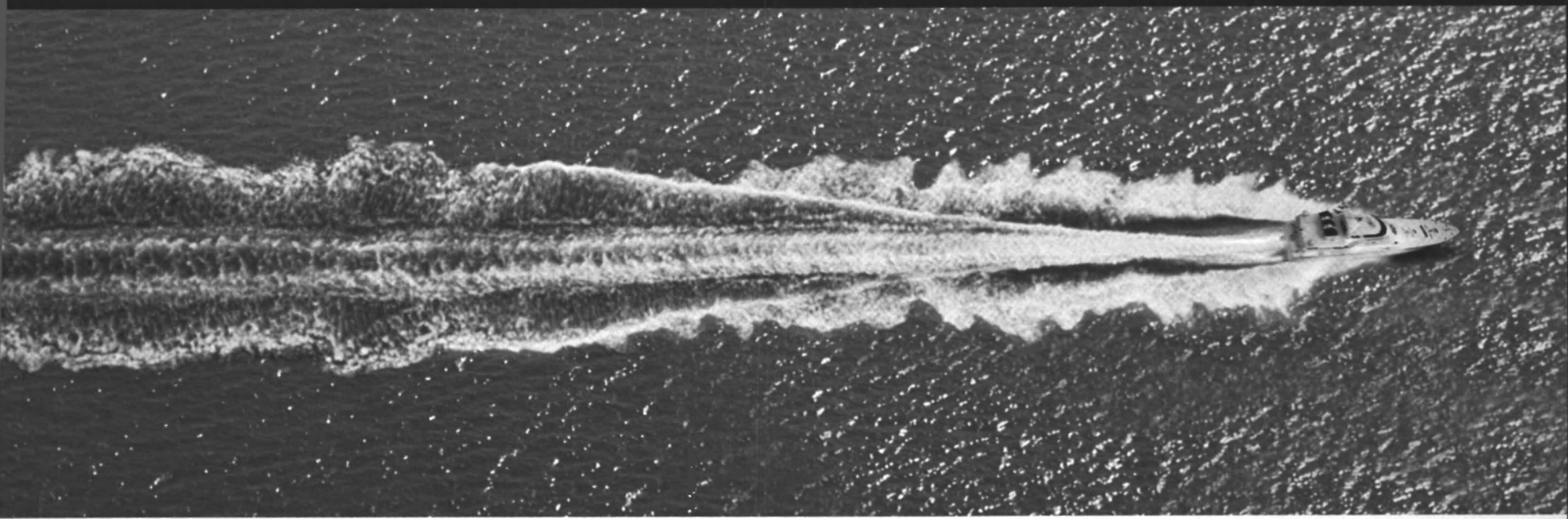
We are also monitoring congressional developments on treaty ratification for the international shipbuilding agreement at the Organization for Economic Cooperation and Development (OECD) to phase out foreign shipyard subsidies.

Some U.S. shipyards now oppose this agreement and have pressured Congress to oppose treaty ratification. If the agreement is not ratified, it could stimulate another round of legislation similar to that proposed last year, which penalizes shipowners who build in foreign yards.

Another issue of interest to ICCL involves cabotage restrictions on foreign-flag passenger vessels. A number of ports are seeking repeal of the restrictions imposed by the Passenger Services Act that prohibit foreign-flag passenger vessels from operating in the coastwise trade of the U.S. The future of cabotage law is unclear at the moment. We have seen recent efforts to chip away at its foundation. Specifically, Representative Jim Oberstar (D-Minn.), a senior Democrat on the House Transportation & Infrastructure Committee, has requested hearings on this issue. He also plans to introduce legislation in the very near future. The bill could potentially open additional markets to foreign-flag cruise vessels. These markets have been blocked to our vessels by



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cabotage laws.

As always, the ICCL is vigorously defending the passenger cruise industry from the imposition of additional taxes and user fees which are unrelated to services provided to it. ICCL generally opposes such legislation because it has a chilling effect on the growth of the cruise industry. As the trade association for the oceangoing, overnight, deep-sea passenger cruise

industry, the ICCL opposes the imposition of additional unrelated taxes on American travelers who already pay hundreds of user fees and taxes totaling billions of dollars each year. In particular, in this congressional session we are monitoring legislative attempts to impose additional U.S. Coast Guard (USCG) inspection fees on our vessels as well as an Immigration & Naturalization Service (INS) user fee.

ICCL is attempting to ensure that its members are not required to pay increased USCG user fees to cover the cost of inspections conducted on another segment of the maritime industry. The amendment introduced by Congressman **Billy Tauzin** (D-La.) earlier this year would increase the USCG user fees paid by our vessels for the cost of inspection services provided to small U.S.-flag passenger vessels. This

amendment would cost the cruise industry \$4 million to pay for a program totally unrelated to any service provided to our vessels or our cruise passengers.

On a similar user fee issue, ICCL is attempting to strike a provision in a Senate immigration bill which seeks to impose a \$6 per passenger fee on our industry to fund illegal immigration efforts. The proposed legislation would lift the current exemption from the \$6 immigration inspection user fee for cruise passenger arrivals from Canada, Mexico and the Caribbean. The proposed INS user fee would raise over \$24 million a year from cruise passengers who are vacationing outside the U.S.

#### International Arena

In addition to concentrating on our Washington agenda, ICCL continues to make inroads to the international arena. We have augmented our staff with the recent addition of Captain **Ted Thompson**, a retired USCG captain. As ICCL's vice president of International Operations, he is responsible for overseeing the myriad of technical issues which challenge our industry, particularly at the International Maritime Organization (IMO).

Recent IMO industry activities include participation in the development of amendments to SOLAS (Safety of Life at Sea). The new SOLAS amendments call for unprecedented safety improvements on passenger vessels to be phased in between October 1994 and 2010. For the first time, these amendments apply to both new and existing ships. By way of overview, the SOLAS amendments call for passenger ships to carry additional firefighting equipment and mandate improvements in the arrangements of fire doors and stairway enclosures designated as a means of escape. The amendments also address the lighting and marking of escape routes and call for installation of smoke detectors and automatic sprinkler systems on vessels that previously were not required to have them. The cruise industry is constantly striving to improve safety procedures. Our excellent safety record attests to the importance the industry places on the safety of our passengers.

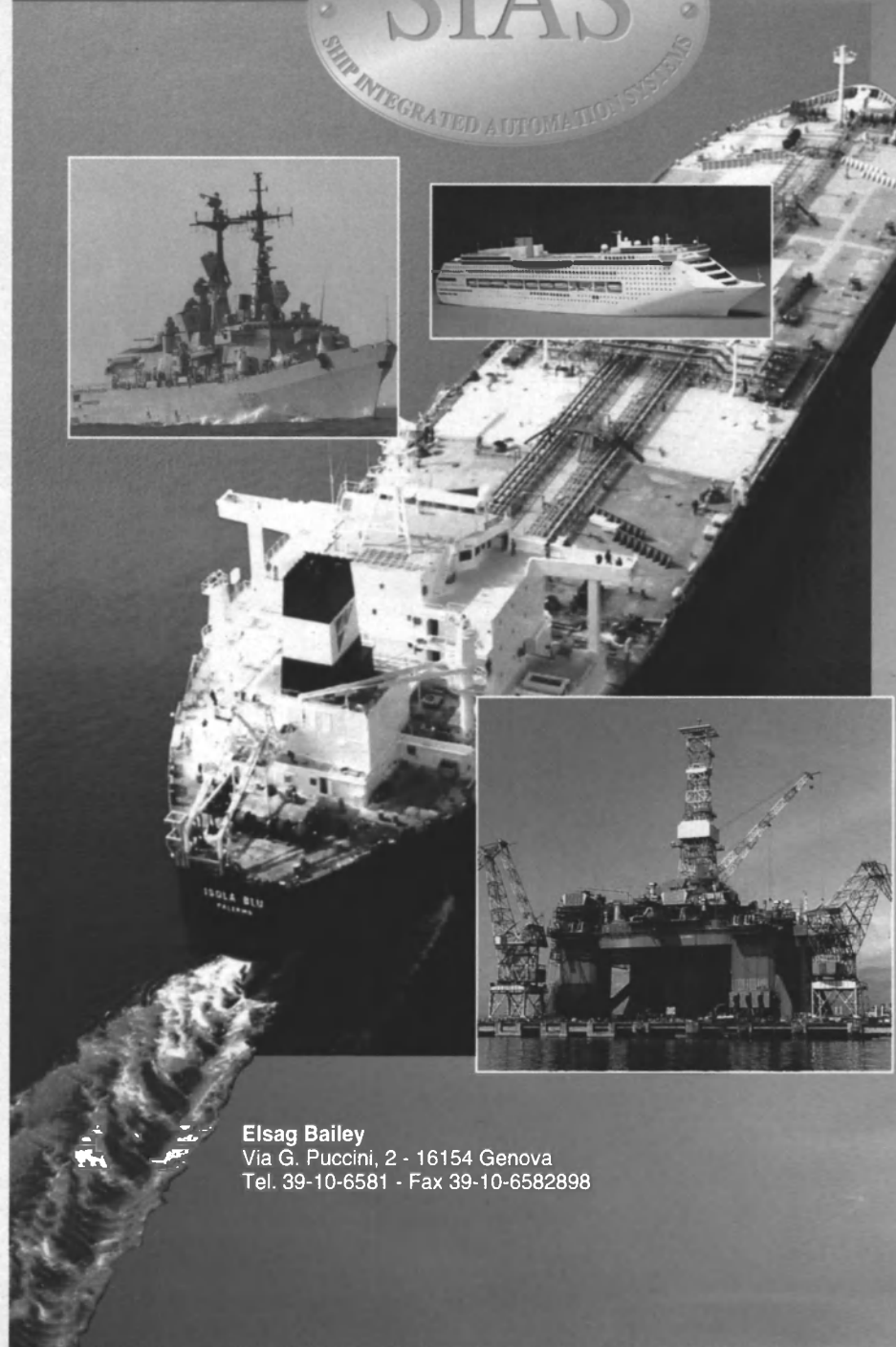
The industry continues its work in the environmental health area through its participation in the Centers for Disease Control (CDC) Vessel Sanitation Program (VSP). We are currently in the process of working with the CDC to establish uniform standards for new vessel construction, with a focus on building ships which ensure the highest health standards for our passengers.

#### Growth

The number of ICCL member ships scheduled to debut in 1995 alone signifies the industry's longstanding expectation that passenger demand will meet or exceed the industry's expanded capacity. Of

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the six ICCL member ships to debut this year, four boast passenger capacities of over 1,700. Added to this will be another 13 member ships scheduled to debut in 1996 and 1997, as well as the addition of two ships by our newest member, Disney Cruise Lines, in 1998. The numbers reflect the industry's vision of continued expansion in this ever-growing vacation market.

Finally, the good news in growth for the industry also brings good news for the nation's economy in general. A recent Price Waterhouse study demonstrated that in 1992 alone, the cruise industry was directly responsible for creating 450,000 jobs nationwide, paying more than \$14.5 billion in compensation and more than \$6.3 billion in taxes to federal, state and local governments. While 20 years ago only 500,000 Americans took cruises, in 1994, 4.6 million Americans took cruise vacations. All projections indicate that this number will increase annually. So as the industry grows, so do its benefits to the nation.

The ICCL will continue to promote the interests of its 21 member lines in the legislative, regulatory and international arenas. Through our work in these areas, we hope to ensure that the overnight passenger cruise industry continues to flourish so that more and more Americans can affordably enjoy the benefits of cruise vacations.

For more information on ICCL, contact **Mary T. Lynch**, director, Public and Industry Affairs, at: ICCL, 1211 Connecticut Ave NW, Ste. 800, Washington, DC 20036; tel: (202) 296-8463; fax: 202-296-1676.

#### Scientific-Atlanta Introduces Personal Sat Terminal; Wins Cruise Ship Contracts

Scientific-Atlanta, Inc., of Norcross, Ga., announced the availability of its next-generation portable satellite communications terminal. The TerraStar™ -M model 9826A provides users with global two-way digital telephone, fax and data satellite communications. The new unit is the latest terminal developed by Scientific-Atlanta to interconnect to the Inmarsat M digital satellite communications service. The unit weighs less than 18 lbs. and is designed for fast, easy deployment. According to **Faris Gaffney**, general manager of Scientific-Atlanta's Mobile Satellite Systems Division, "The TerraStar-M provides the flexibility to carry, set up and use anytime, anywhere, even in the most inconvenient situations." The company also introduced the TerraStar Multi-M, which can accommodate up to eight voice, fax and data channels.

In the maritime market, Scientific-Atlanta made significant sales of its MariStar Multi-M terminal: in

addition to installations on *Legend of the Seas* and *Crystal Symphony*, Scientific-Atlanta installed MariStar Multi-Ms on the *Silver Wind* (Dec. 1994), *Sky Princess* (Dec. 1994), and *Ryndam* (Aug. 1994).

The MariStar-M includes two components: a rack-mounted indoor electronics unit and a single radome-enclosed, stabilized antenna. The antenna ranges in size from one to two meters. Options include STU-III compatibility, credit

card processing and high-speed data upgrade.

For more information on Scientific-Atlanta  
Circle 67 on Reader Service Card

#### BOATRACS Wins Order For 50 Satcoms

BOATRACS, Inc., announced that Hollywood Marine has con-

tracted with the company to purchase an additional 50 BOATRACS satellite communications system units by year-end 1995. To date, more than 40 of the units have been shipped and are being installed. The BOATRACS system, which provides two-way, real-time messaging capabilities as well as boat performance and location reporting, incorporates QUALCOMM's OmniTRACS system adapted and enhanced by the company for marine application.

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Hollywood Marine, based in Houston, Texas, is one of the largest marine transportation companies in the U.S., operating more than 230 barges and 96 towboats primarily serving the intracoastal petrochemical market in the Gulf Coast states. BOATRACS, based in San Diego, is the U.S. marine market distributor of the OmniTRACS system, a satellite-based communications and tracking system manufactured by QUALCOMM Incorporated.

For more information on BOATRACS  
Circle 69 on Reader Service Card

### 3M Traction System Expands Customer Options

3M has introduced the 3M Safety-Walk Custom Color program, a custom order program for 3M Safety-Walk Slip Resistant Treads in medium and resilient grades.

The new program offers an opportunity to incorporate traction products into the initial design without losing aesthetic appeal. The 3M Safety-Walk treads are available in any Pantone color code — more than 1,000 colors.

In addition to offering a large number of colors, 3M Safety-Walk treads are available in any size or shape that fits the parameters of 4 ft.

### Digital Sat-TV For Boats

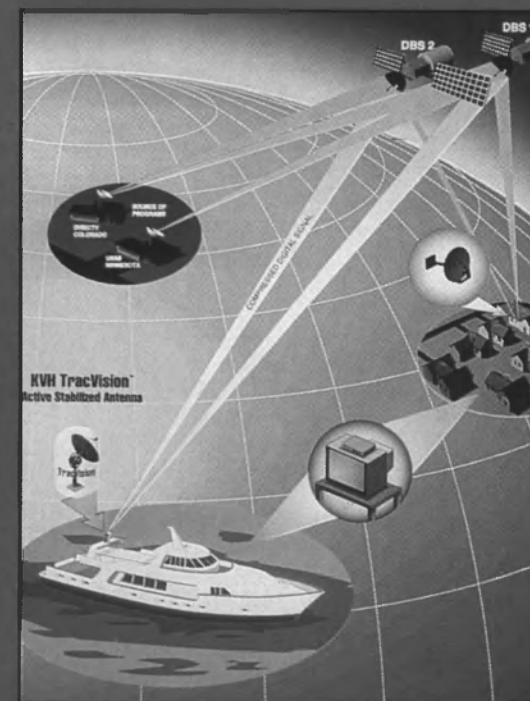
Digital satellite television is now possible on boats with KVH Industries' latest product, TracVision™. The TracVision system is the link that connects a boat to digital satellite service. The system is an actively stabilized antenna system that keeps a small, 18-in.-diameter carbon fiber satellite antenna precisely pointed at new, high-power satellites.

As a boat turns, pitches and rolls, TracVision moves the satellite antenna in exactly the opposite direction. As a result, TracVision maintains the one-degree tracking accuracy needed to assure uninterrupted satellite TV reception on a boat.

TracVision uses earth-referenced compass and attitude sensors to continually measure pitch, roll and azimuth of vessel. These sensors are stabilized using KVH's patented, miniature rate gyroscopes. Precise measurements of the vessel's movements are relayed to the TracVision's Central Processing Unit (CPU). The system's software calculates the rate of the boat's movements and translates them to stable land-based coordinates. These coordinates are converted into commands in the motor control unit, and the commands activate and guide the robotic arm.

"Our antenna aiming technology makes digital satellite TV possible on boats," explained KVH Marketing Director Jim Dodex. "Now you'll be able to watch one of 150 channels of laser-disk quality television from your boat while it's underway."

For more information on KVH  
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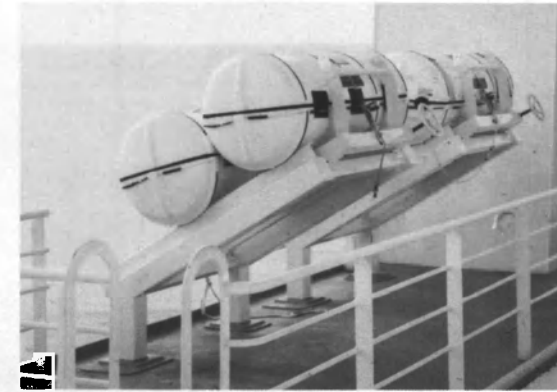
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by 3 ft. (1.2 by .9 m). 3M will create a die and die-cut any ship that fits within those dimensions.

"The 3M Safety-Walk Custom Color Program provides building and product designers the opportunity to incorporate slip-resistant materials into their creations without giving up looks," said **Jean Bast**, 3M Home and Commercial Care Division. "The wide array of colors and shapes also creates new uses for the adhesive-backed treads, from a custom-cut foot pad for a snowmobile to a colorful mosaic in a front entryway."

For more information on 3M  
Circle 123 on Reader Service Card

#### ScanSafe: Intelligent Passenger Safety System

ScanSafe International markets a patented, certified alarm and evacuation system for passenger vessels, the Intelligent Emergency System (IES) — an early warning system based on temperature, smoke, water and other sensors placed throughout a ship and linked to a monitoring and control console on the bridge.

When sensors detect a possible emergency, the system alerts the officer on watch, who can then manually activate an evacuation of part or all of the ship. Passengers follow illuminated arrows in electroluminescent light strips mounted on decks, along corridors and around doors. The arrows move to the left or right as the IES continually evaluates the emergency and updates safe evacuation routes, as in the case of fast-spreading smoke.

If an officer fails to respond within a pre-programmed period, or if the circuit to the bridge or any part of the ship is disrupted, the IES can automatically activate the alarm and evacuation sequence, with sensors choosing the safest routes. At the same time, the system can automatically operate doors, watertight hatches, fire dampers, sprinklers, or the ship's ventilation system to control smoke or help choke a fire.

Stena Line AB of Sweden has ordered versions of the IES for its new generation of high-speed catamaran ferries — reportedly the largest vessels of their kind — now under construction at Finnyards.

For more information on ScanSafe  
Circle 124 on Reader Service Card

#### WCS Offers Desktop Card-Swipe Services

World Communication Systems of Newport News, Va., has developed a means of providing automated credit and debit card service to individual cruise ship cabins and other locations where wall mount pay station use is impractical.

The stand-alone WCS TC-200 desktop card-swipe phone reportedly enables any user to place personal phone calls from the privacy of a cabin, ship's office, or similar location. The unit simply dials any

telephone in the world, using the familiar North American dialing format. A voice prompt requests the user to swipe the credit or debit card through the attached reader, after which the call is automatically processed via the WCS validation facility to the desired destination.

WCS will also customize the unit for whatever special requirements the shipowner may have.

For more information on WCS  
Circle 125 on Reader Service Card

#### Sea Tel: Satellite TV Around The World

Sea Tel has been installing satellite TV systems on vessels for more than a decade. Several models are available, with configurations to suit the geographical operating area and customer needs. Both active and passive tracking methods are used to keep the "TV At Sea" system locked onto the satellite.

TV programs are received and processed by satellite receivers and distributed via a UHF/VHF system to various monitors and TV sets. Most installations are configured for use in a multi-standard role, so programs can be provided via satellite as the vessel moves around the world. Provision of a GPS interface helps ensure a high level of automatic operation of the TV At Sea system.

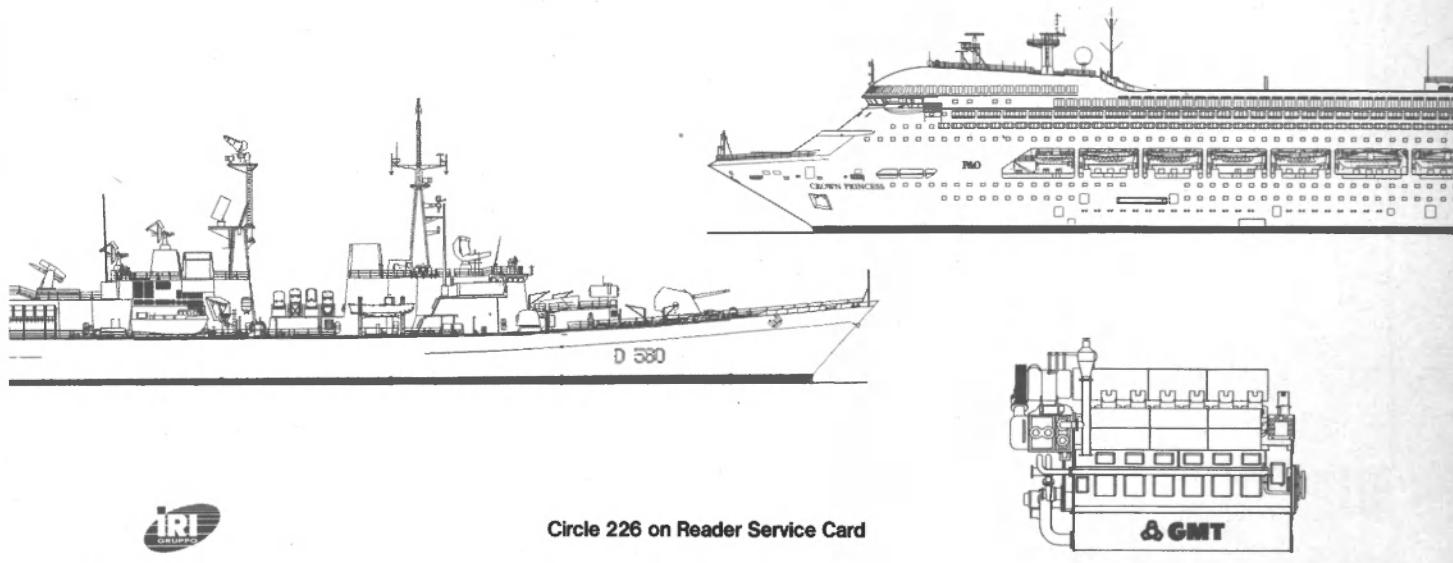
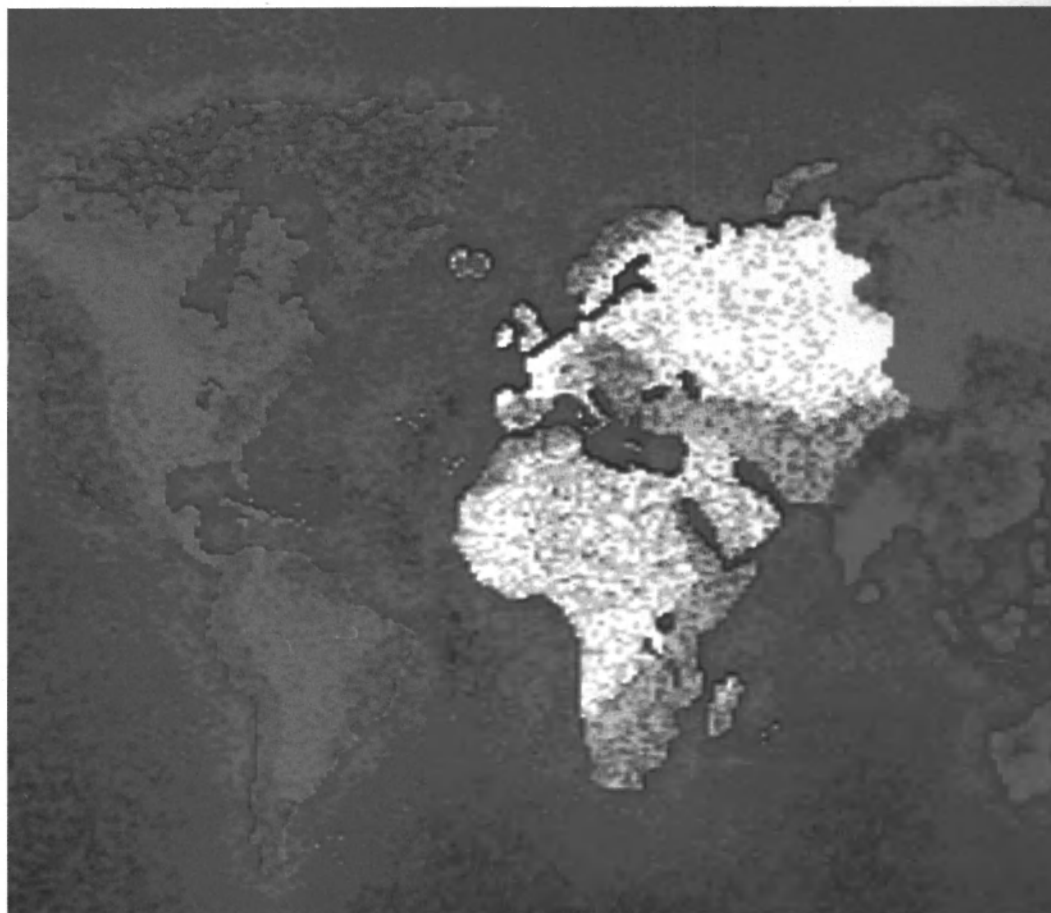
For more information on Sea Tel  
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# FINCANTIERI IS BUILDING FOR THE SEA

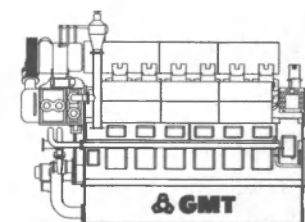
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### OPA 90 Provider Expands Services

SMQI Services, Inc., a provider of OPA 90 services, and subsidiary of the Scandinavian Marine Claims Office (SMCO), was scheduled to formally transfer its response services from Stamford, Conn., to Houston, Texas, on the first of July. **Signe Bru** will lead SMQI's Texas operation, acting as the primary Quali-

fied Individual for OPA 90 and MARPOL clients. The Houston team will be comprised of employees with backgrounds in emergency response management, ship handling, marine engineering, naval architecture, and U.S. Coast Guard (USCG) experience. SMCO Services, Inc. will remain in Stamford, continuing to provide federal, state and interregulatory consulting and compliance services.

For more information on SMCO  
Circle 84 on Reader Service Card

### Unitor Acquires GF Marine

Unitor AS has taken over all shares in GF Marine AS, at a price of \$1.76 million. GF Marine AS is a supplier of heating, ventilation, air conditioning, automation and remote control systems for the shipbuilding industry. Unitor has previously acquired the interests of Ticon Isolering, and DanHVAC, and the takeover of GF Marine is intended to further contribute to the

### company's newbuilding strategy. Unitor To Install Passenger Cabins On New Cruise Ships

Unitor's new marine contracting division won contracts for turnkey responsibility for the installation of 900 pre-fabricated passenger cabins (450 per ship) aboard two 74,000-grt vessels under construction at Kvaerner Masa-Yards' Helsinki New Shipyard for RCCL. The contract value is approximately \$4 million. The company is currently involved in similar work on two CC ships, *Imagination* and *Inspiration*, also being built at the Helsinki shipyard. Unitor is supplying 500 complete passenger cabins to each 70,367-grt vessel.

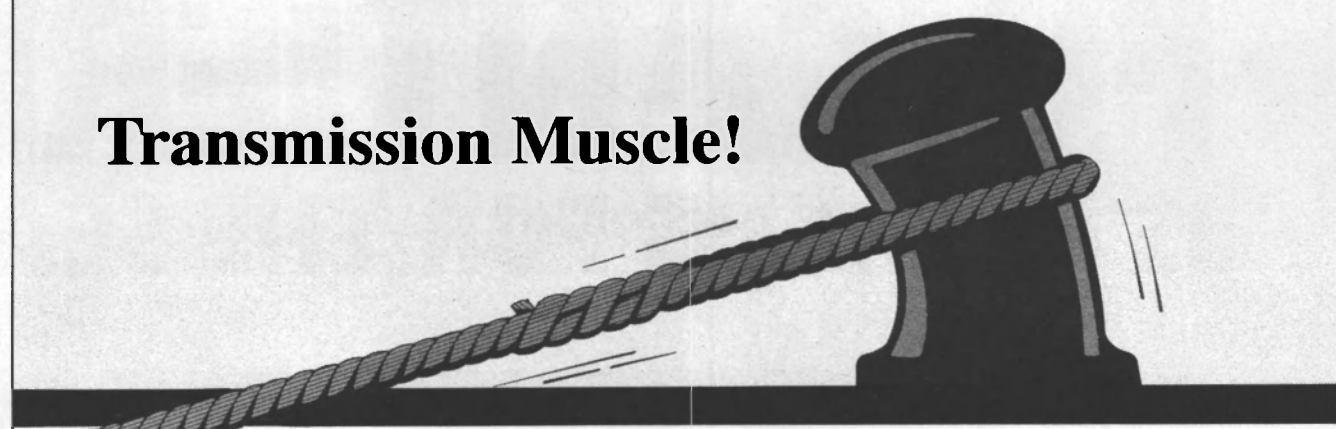
For more information on Unitor AS  
Circle 94 on Reader Service Card

### American Pacific, Buckeye Fire Produce Portable Halon Fire Extinguishers

American Pacific Corp. and Buckeye Fire Equipment Co. have completed the successful testing of four Halotron I portable fire extinguisher models. Buckeye Fire Chairman **Tomas J. Bower** said, "Halotron is the first clean gas halon 1211 replacement to complete the UL testing process since the ban on the production of halon 1211 took effect in January, 1994." Buckeye Fire Equipment Co., headquartered in King Mountain, N.C., manufactures a line of halon, dry chemical, and carbon dioxide portable fire extinguishers for the industrial market. American Pacific's subsidiary Halotron manufactures Halotron I, an EPA- and FAA-approved halon 1211 replacement.

For more information  
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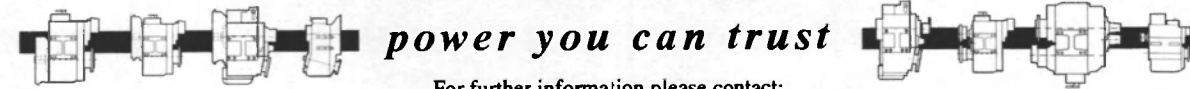
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### CALL FOR PAPERS

SNAME and the Department of Naval Architecture and Marine Engineering, University of Michigan, are sponsoring the symposium dubbed "Small Craft Marine Engineering, Resistance and Propulsion Symposium," scheduled for May 15-17, 1996, at the Radisson Golf and Conference Center in Ypsilanti, Mich.

Conference organizers are currently seeking papers for presentation, and authors are invited to send abstracts for papers, preferable in the area of:

- Advanced Engine Developments: High speed diesels, turbines
- Propellers and Other Propulsors: Surfacing props, water jets, hybrid drives
- Alternative Drive Configurations: V-drives, Z-drives
- Planning Craft Resistance: Predictions, wave effects
- Load Predictions and Motions: Slam and planing, accelerations
- Auxiliary systems: Fuel, water, power generation
- Control systems: Steering, roll stabilizers, trim tabs, rudder roll stabilizers, integrated systems.

Abstracts should be sent, by September 15, 1995, to: Professor **Michael M. Bernitsas**, chair, Department of Naval Architecture and Marine Engineering, University of Michigan, 2600 Draper Road, Ann Arbor, Mich. 48109, tel: (313) 936-0566, fax: (313) 936-8820, e-mail: michael.bernitsas@um.cc.umich.edu.

Maritime Reporter/Engineering News

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## ELECTRONICS UPDATE

### Integrated Bridge Designed For Safety, Productivity

The integrated bridge concept has steadily gained support among shipowners and operators, a group forced to pay closer attention to safety matters as a result of high-profile losses and international regulations. In fact, some industry estimates claim that 70 percent of new construction features a system classified as an integrated bridge, and that number is expected to increase.

Top manufacturers of the integrated bridge systems include Sperry, Racal Decca, STN Atlas Elektronik, Kelvin Hughes, and now Raytheon, following its acquisition of Anschutz. In fact, a driving factor in Raytheon's bid to buy Anschutz was gaining the integrated bridge capability.

"Our biggest lack of product was in the integrated bridge navigation system. The majority of new construction is requiring one or maybe two suppliers to provide a complete navigation/communication package. Realizing that we wanted to have such a product, and realizing that the Anschutz product was available, the decision was made to make the investment," said **Bob Schwartz**, marketing manager commercial programs, Raytheon, in an interview with *Maritime Reporter & Engineering News* earlier this year.

Each manufacturer has carved its own marketing niche, but in general each is seeking to be a single-system supplier, and much effort has been expended spreading the word about ease-of-installation benefits for the yards, and safety and quality benefits for the owners.

#### Vision 2100

Designed to meet the stringent requirements of shipowners and builders, the Vision 2100 from Sperry is a line of bridge console configurations which are available in three levels of modularity: Stand Alone Cabinets; Console Modules; and NavDECK.

Vision 2100 NavDECK is the complete bridge module, ready for drop-in installation. The system is reported by Sperry as helping to reduce bridge construction time and saving the designer and builder time and money. The system is factory wired and tested, with central hook-up and power distribution. The company assumes turn-key bridge responsibilities from design conception to sea trials. The Voyage Management System VT is perhaps the true revolution behind the system. The second generation system is reportedly user friendly and uses open architecture industry standard hardware and Microsoft's Windows NT operating system. Aesthetically, the system is of a modern design and pleasant to look at — a factor when selling to the image-oriented cruise industry.

#### Ship Control Center

The Ship Control Center (SCC) system from STN Atlas Elektronik integrates all navigation, commu-

nications and main control operations as a single source package solution. It is ergonomically designed and uses standardized mod-

ules and interfaces. The SCC system is available in three basic versions: SCC Standard; SCC Nav; and SCC W1.

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monitoring and control of the system is provided for all ship management, safety and cargo control operations. The SCC-W1 version with the Copit-M Design (one-man bridge), according to the manufacturer, corresponds to the most stringent requirements regarding integration and safety on the ship. It is intended for the most sophisticated maritime projects.

**MIRANS**

Racal-Decca made a significant new development in marine electronics when it made big ship integrated bridge systems available for smaller ships, via its new MIRANS 1000 and 2000 systems. The new MIRANS (Modulate, Integrated Radar and Navigation System) models are designed for any vessel that requires sophisticated electronics, but lacks the space to accommodate big ship systems. MIRANS 2000 is a system which features a ChartMaster electronic chart module, complete with a 20-in. high resolution screen.

MIRANS 1000 is an integrated bridge system with a MapMaster module. This differs from ChartMaster in that, when used in conjunction with a chart digitizing table, it enables the user to draw his or her own electronic map.

**NINAS 2**

Kelvin Hughes's contribution to the integrated bridge market is the NINAS 2 (Nucleus Integrated Navigation System), which monitors and automatically controls an array of navigational systems and functions.

Radio Holland U.S.A. supplies the system in the U.S., and reports that its popularity continues to grow. To date there are more than 30 ships, of various types, that have been fitted, with several more to come on line in the next few months. One of the most recent successes was the replacement of existing bridge equipment on the *QE2*. The scope of supply included the following integrated equipment: electronic chart display and information system (suitable for raster charts as well as for DX-90 charts when they become available); two "ECTAB" electronic chart tables, complete with Yeoman puck; NINAS nucleus integrated navigation system display; and three Nucleus color ARPA displays.

For more information on integrated bridge systems from the following companies, please circle the corresponding number on the Reader Service Card in this issue:

Kelvin Hughes	127
Racal-Decca	37
Radio Holland U.S.A.	152
Raytheon	38
Sperry	39
STN Atlas Elektronik	40

**Polaris Equips Scientific Vessels With Integrated Navigation Systems**

Polaris International Ltd., of Gloucester, U.K., sold two SeisNet integrated navigation systems for use on seismic exploration vessels. The first is for 2D and hydrographic applications on the *R/V MTA Sismik 1*, owned and operated by the Turkish General Directorate of Mineral Research and Exploration (MTA). The second is for Western Geophysical as part of a complete 3D package for a vessel to be built by Ulstein in Norway for Korean interests. SeisNet systems use sensor data to produce solutions for the positioning of seismic vessels and their streamers. Display options provide navigators with information on navigation data quality, steering, and real-time 3D binning. SeisNet can use inputs from propulsion and rudder systems to provide control outputs for automatic steering.

For more information on Polaris International, Ltd.  
Circle 96 on Reader Service Card



**Radio-Holland USA B.V.**

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Corpus Christi, TX	(512) 883-5283
Houston, TX	<b>(713) 943-3325</b>
Long Beach, CA	(310) 595-0177
Vancouver, WA	(206) 737-0519
Seattle, WA	(206) 768-1601

Circle 29 on Reader Service Card

## Satellite Communications Review



### Service With a Satellite: A Guide To Top Service Providers

An important technology at sea today is that of satellite communications. Providing a means of staying in contact with the shore in the event of emergency is one of the most crucial, but far from the only, use for this technology. Lower costs and higher levels of service are direct results of technological improvements. In day-to-day use, it allows voice and fax capability for vessels even in remote locations — transforming a ship at sea or an oil platform into a fully-functional floating office. *MR/EN* has dedicated this section to those who provide these vital services — vital to safety, and vital to business.

#### KEY:

AORE ..... Atlantic Ocean Region — East  
AORW ..... Atlantic Ocean Region — West  
POR ..... Pacific Ocean Region  
IOR ..... Indian Ocean Region  
LES ..... Land Earth Station

#### American Mobile Satellite Corporation (AMSC)

On April 7, 1995, the American Mobile Satellite Corporation (AMSC) launched what is reportedly the largest commercial mobile communications satellite ever built. In the fourth quarter of 1995, AMSC will introduce its Skycell satellite telephoning service, providing the maritime industry with a portfolio of affordable satellite communications products. The Skycell service telephone will be equipped with voice, data and fax capabilities.

AMSC is licensed by the Federal Communications Commission to provide its Skycell services throughout the U.S., including Alaska, Hawaii, Puerto Rico, the U.S. Virgin Islands and 200 miles off U.S. shores. Therefore, users can maintain a constant communications link

to any telephone in the world while traveling in the coverage area. Direct-dial service connected through the public switched telephone network will allow for secure point-to-point and point-to-multi-point communications. Packet and circuit-switched data will also be supported to provide users with a comprehensive and affordable data communications solution.

For more information on AMSC  
Circle 56 on Reader Service Card

#### COMSAT

With seamless Inmarsat A and B coverage of the world, COMSAT Maritime Services is a single source for fax, data, voice and telex service. COMSAT also provides global Inmarsat M service for voice and fax needs, and Inmarsat C service for data communications. For customers at sea, COMSAT says it offers unparalleled service and reliability.

COMSAT offers free operator service 24 hours a day and seven days a week, free language assistance in over 140 languages, telex group calls, credit card billing, value-added services like shipboard public telephone

services, 56/64 kbps data service, FaxMail, and news and information services. To use any of COMSAT's services, choose LES "01" for Inmarsat A and "001" for Inmarsat B and M service.

For more information on COMSAT  
Circle 55 on Reader Service Card

#### Telecom Italia

Telecom Italia operates in the national and international markets. The company has 24 million users and more than 100,000 employees. The company is controlled by STET, which is IRI's telecommunications holding company.

A division of Telecom Italia is the licensee of the Italian Ministry of Port and Telecommunications for handling maritime communications, including installation, operation and maintenance of radiotelephonic and radiotelegraphic radio stations on board.

The company also operates the services connected with the traffic of telephone, telegraph and satellite radio communications. The company acts as the "traffic accounting authority," officially recognized by

international organizations and institutions.

Telecom Italia, Common Customer Division, Radio Maritime Services and Assistance to Navigation, controls and operates Coastal Radio Stations and the fully automated Inmarsat earth station of Fucino.

In addition, Telecom Italia ensures, on behalf of the Ministry of Merchant Marine, all radio communication services for the Safety of Life at Sea, and navigation (watchkeeping on the international distress frequency, distress alarm, etc.).

The activity of Telecom Italia also includes the marketing of radio communications and radionavigation equipment from sophisticated satellite communications systems (Inmarsat) to up-to-date equipment for pleasure craft.

For more information on Telecom Italia  
Circle 57 on Reader Service Card

#### BT Inmarsat

BT Inmarsat provides global satellite communications solutions for the commercial shipping and land



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The price of using the BT Inmarsat service has never been lower. In fact our rates are now among the keenest in the world.

So from now on when you route calls through the BT Goonhilly Land Earth Station you'll save money. And your communications will be in the safe hands of one of the world's most experienced and reliable Inmarsat operators.

What's more, in addition to the new lower prices there are a host of other service enhancements.

In order to help our American customers for instance, we can now quote prices and bill you in US dollars.

We've also made it even easier to benefit from our discount scheme. To qualify, make just US\$750 worth of calls in any one month on any combination of our Inmarsat-A, B-Sat, C-Sat and M-Sat services. Your calls can be voice, fax, data, high speed data and telex. All landline charges are included.

If you'd like to obtain a discount on your BT Inmarsat calls, please phone us on **1-800 241 9467** (toll free from the US), or +44 171 492 4996 for full details.

Once you've seen them we think you'll agree the future's looking very bright indeed.



Circle 21C on Reader Service Card

mobile sectors, offering dial-up voice, fax, image and data services to more than 200 countries worldwide.

BT Inmarsat connects to the Inmarsat satellite network via its U.K. LES at Goonhilly, and affiliate stations in Norway and Singapore, giving global reach across AORE, AORW, POR and IOR.

The maritime portfolio currently comprises: Inmarsat A and Inmarsat A High-Speed Data (HSD)

for voice, data and telex; the B-Sat service, long-term digital successor to BT Inmarsat-A; C-Sat store-and-forward satellite data messaging; the M-Sat portable voice and fax service; and SatMail, maritime e-mail featuring Internet connection.

Commercial shipping organizations can also take advantage of the BT Inmarsat combined discount scheme that gives reductions of between five and 20 percent across all

services for from-mobile calls. For more information on BT Inmarsat Circle 58 on Reader Service Card

#### PTT Telecom Netherlands (Station 12)

On July 1, 1995, Station 12, a division of PTT Telecom Netherlands, became global when its

Inmarsat A, B and M service came available in the POR in addition to its other coverage areas. have already had access to Inmarsat A, B, M and C services in the three regions: IOR, AORE AORW.

With this extension, Station 12 reportedly becomes the first operator to provide worldwide service through a single access number. To accommodate the expansion Station 12 is now using a second LE Yamaguchi, Japan, in addition to its own LES in Burum.

As a result of the extended coverage, new uniform and lower charges were introduced as of July 1. The new charges offer customer savings of up to 25 percent.

Besides the standard Inmarsat services, Station 12 is known for innovative value-added services like S.400, the gateway to the world's X.4 networks, SAT.PC, two-stage access and its help desk through Station customer services.

For more information on PTT Telecom Netherlands Circle 59 on Reader Service Card

#### OSN

O'Gara Satellite Networks (OSN) recently formed an alliance with Morsviazputnik, MVS-USA and Magellan Systems Corporation. A new company, OGM Communications, Ltd., has been formed and will ally with other major companies in the near future. OGM as a group of affiliate companies will strive to bring together the appropriate expertise and resources to provide a single source capable of meeting all the diverse telecommunications needs of customers.

OSN is an international supplier and customer support center for portable Inmarsat A, B and M terminals. Its Mercury 2000 is reportedly the world's first land mobile Inmarsat M vehicular telephone system. This compact unit consists of an Inmarsat type-approved transceiver, interfaced with a unique, low-profile, auto-tracking, phased array antenna.

OSN will offer a wide range of mobile satellite communications equipment, as well as a complete licensing, commissioning and billing service, with very attractive rates. It will provide access to the Inmarsat satellite network through LESs worldwide, including Canada, Hong Kong, Australia and the U.S.

For more information on OSN Circle 60 on Reader Service Card

#### Singapore Telecom

Singapore Telecom (ST) was a founder of Inmarsat, and has been a signatory since Inmarsat's establishment in 1979. Today, Inmarsat A, B, C and M services are provided by ST via its Sentosa LES. ST's satellite network, together with its direct submarine cable links to most major cities in the world enable it to provide superior quality calls, says the company. ST's network is also 100 percent digital. This means custom-

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... with our Integrated Ship Management System Gearmar 100 ISM to support the officers on board during routine activities.

For further information please contact fax: +49 (40) 88 25 - 4103

STN ATLAS Elektronik GmbH

Marine Division  
Behringstraße 120  
D - 22763 Hamburg  
Phone: +49 (40) 88 25 - 0  
Sebaldsbrucker Heerstr. 235  
D - 28305 Bremen  
Phone: +49 (421) 457 - 0



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*Scientific-Atlanta MariStar® Multi-M Satellite Communications System improves passenger service while increasing per passenger revenue.*



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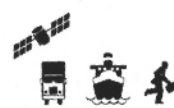


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MariStar-M systems are available with 1-16 channel configurations, while MariStar Multi-M systems can be supplied with a 56/64 kbps channel if required.

Net revenue per passenger will increase dramatically, facilitated by low initial capital investment, and reduced costs for usage and credit card processing. For Multi-M channel configurations, a very user friendly Monitor & Control system (M&C) records all call details. Your passengers will be delighted with the improved service and so will you.

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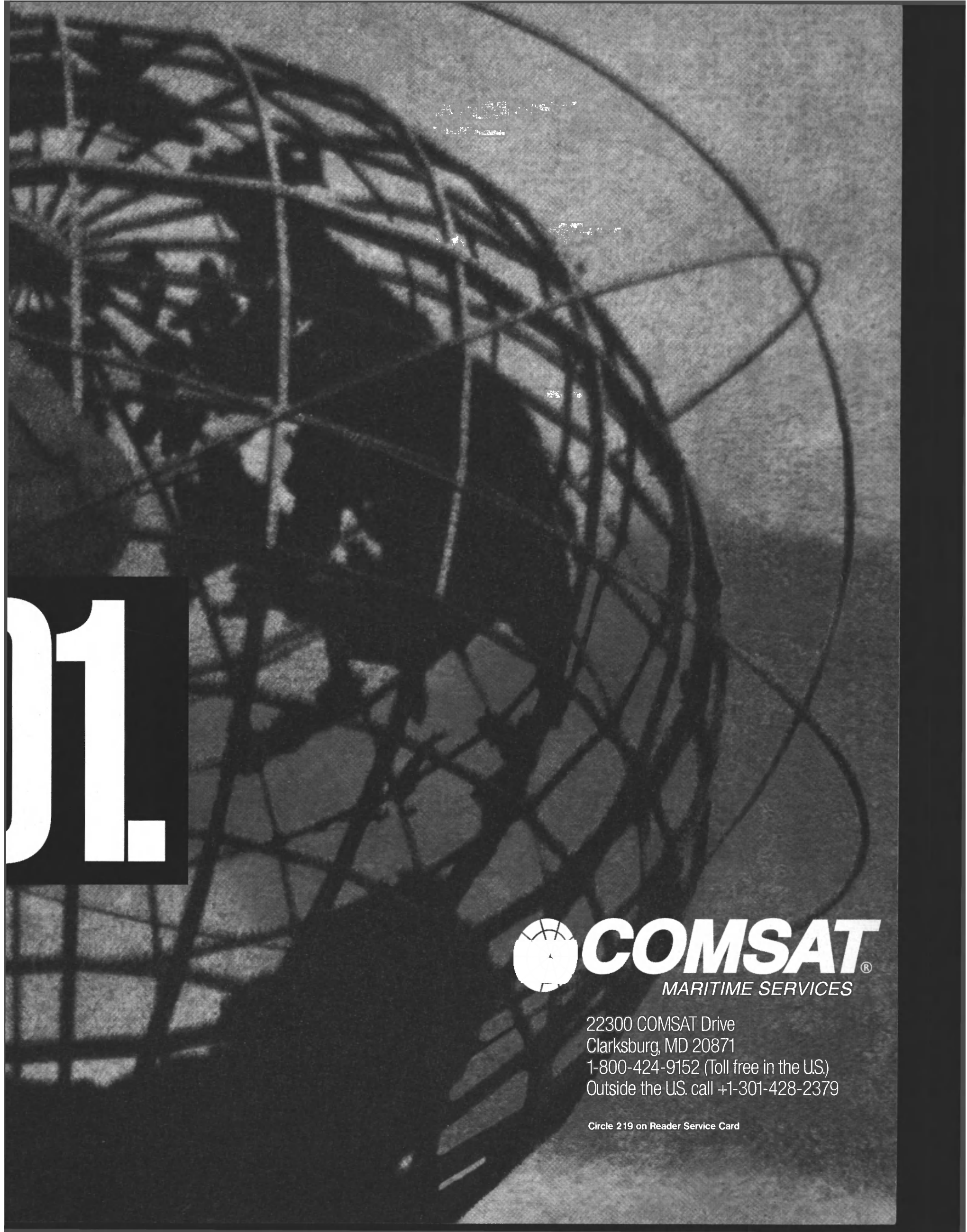


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ers can enjoy high-quality and value-added services.

There are also no land-line charges for calls to Singapore, the U.K., Norway, Denmark, Finland, Sweden and Iceland due to unique arrangements with British Telecom and Telenor. A comprehensive range of Inmarsat 2-digit code services is available via telephone and telex. Singapore Telecom says it is committed to state-of-the-art communications at the most competi-

tive rates, wherever the customer may be.

For more information on Singapore Telecom Circle 61 on Reader Service Card

**MVS**

MVS is a premier provider of complete, global Inmarsat satellite network communications services.

MVS USA's strategic alliance with Morsiaivspudnik, the Russian signatory to Inmarsat, and its most recent alliance with O'Gara Satellite Networks and Magellan Systems Corporation — called OGM Communications, Ltd. — now provides MVS's customers with a unique single source for all their diverse Inmarsat communications needs at highly competitive rates, including: global service network; wide range of satcom equipment

models for sale, lease and discounted usage plans; MVS L — exclusive discount for terminal and terminal calling; simple monthly U.S. billing; American press payment options; con Russian licensing; full comming services; 24-hour network port; and many additional customized services.

MVS claims its global network offers Inmarsat M and B communications services at cost. MVS is also capable of providing Inmarsat A and C analog services through its strategic operating agreements worldwide.

For more information on MVS Circle 62 on Reader Service Card

**ORBCOMM**

In April, Orbital Communications Corporation (ORBCOMM) of Dulles, Va., launched the first two satellites into low-earth orbit for the purpose of establishing worldwide, low-cost messaging data communications systems.

For near real-time coverage of the U.S. and adjacent ocean regions there will be four Gateway Stations (GESs) and one Net Control Center (NCC). Other countries around the world will have their own NCCs and GESs and use of the satellites. Compacts in 20 countries have signed compact licensee agreements with ORBCOMM to procure ground stations and provide services. ORBCOMM expects to provide service in 36 international markets by 1998.

ORBCOMM reports that LEO satellite system advantages include lower launch costs; lower power requirements for communicating an LEO versus a geostationary satellite; availability of Doppler shift signal for integrated position determination; use of proven, inexpensive VHF electronics and antennas; and excellent overall link availability.

Subscriber communicators are available in a number of different configurations including compact lightweight devices with long-life batteries, 5-watt transmitters, antenna, keypad and LCD screen. Most have data ports and many simple black boxes which can be integrated with GPS receivers or computers and other systems.

Potential uses for ORBCOMM in the marine industry include e-mail type messaging, remote monitoring of barges and other assets, time digital communications such as position reports and two-way distress alerting.

For more information on ORBCOMM Circle 63 on Reader Service Card

**BIMCOM**

BIMCOM's founding organization is BIMCO — the Baltic & International Maritime Council, which represents over 60 percent of

(Continued on page

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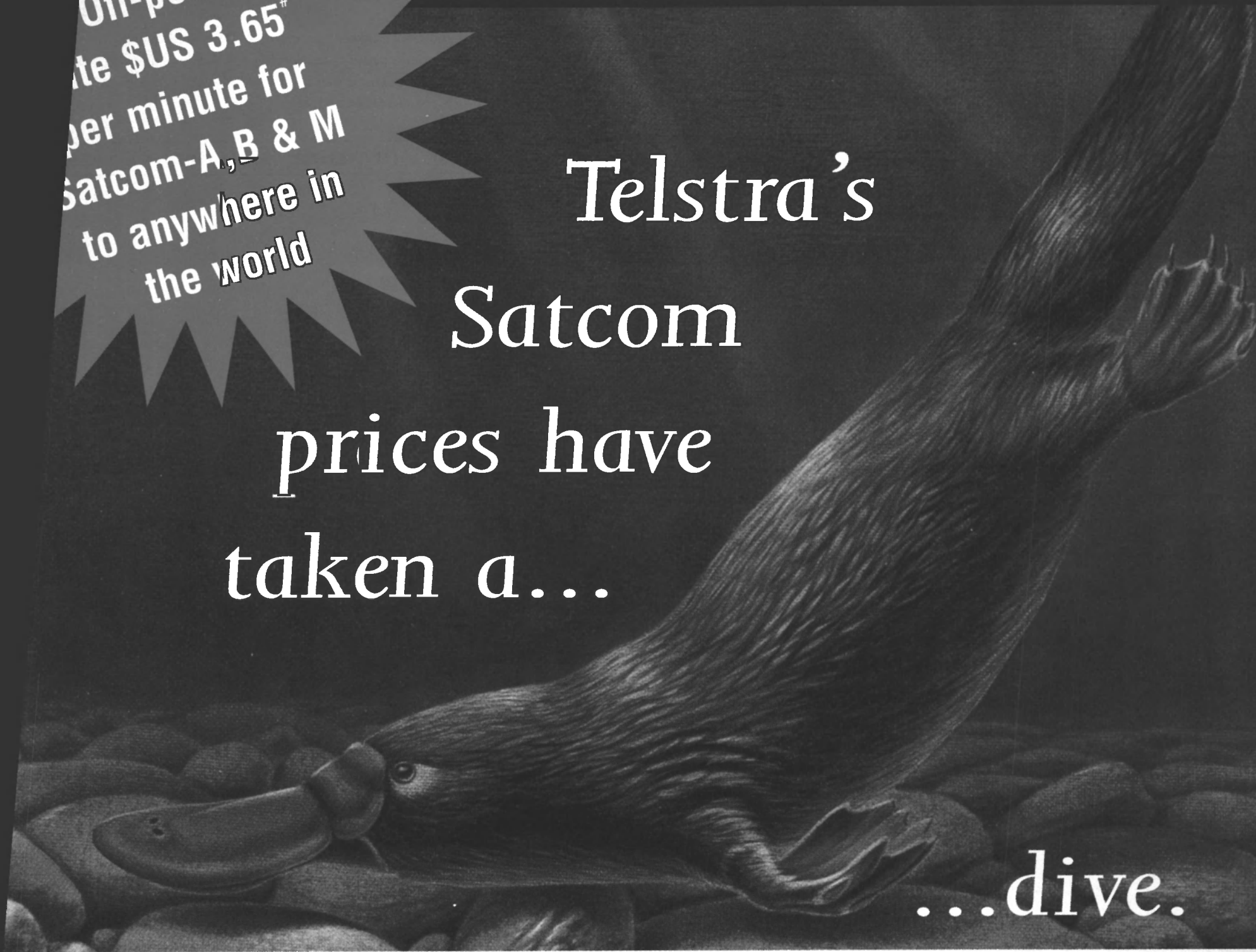
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**PRINCIPAL WORLD SHIPBUILDING CONTRACTS RECORDED — MAY 1995**

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OWNER/OPERATOR	COUNTRY	SHIPYARD	COUNTRY	TYPE	SUBTYPE	No.	TEU	TPM	GT	CAR/TRAIL/PAX	M. CU.	DELIVERY	PRICE M
BAO ISLAND	HONG KONG	CHINA SHIPBUILDING CORP.	TAIWAN	BULK CARRIER		2	165,000					9/97	81
COSCO	SINGAPORE	HUDONG	CHINA	BULK CARRIER		2	27,000					9/97	
CHINA STEEL CORP.	CHINA	CHINA SHIPBUILDING CORP.	TAIWAN	BULK CARRIER		3	132,000					1/97	11
DAICHI CHUO KISEN	JAPAN	SHIN KURUSHIMA	JAPAN	BULK CARRIER		2	24,000					9/97	24.1
DAIICHI CHUO KISEN	JAPAN	OSHIMA	JAPAN	BULK CARRIER		2	47,000					9/97	
DAHE STAR	JAPAN	HITACHI	JAPAN	BULK CARRIER		1	64,200					11/96	
EAC	DENMARK	GDANSK	POLAND	BULK CARRIER	OPEN TYPE	2	1,700	48,800				9/97	41
FRATELLI D'AMATO	ITALY	OSHIMA	JAPAN	BULK CARRIER		2	47,300					6/97	31.68
FRATELLI D'AMATO	ITALY	FINCANTIERI	ITALY	BULK CARRIER	PANAMAX	1							30.5
IMC/GLOBAL MARITIME	SINGAPORE	HUDONG	CHINA	BULK CARRIER		2	28,000					9/97	40
MALCON NAVIGATION	SINGAPORE	HALLA	KOREA	BULK CARRIER		1	168,000					1/97	
MITSU OSK	JAPAN	DAEWOO	KOREA	BULK CARRIER		1	170,000					8/97	43
NISSHO KOREAN	KOREA	CHINA SHIPBUILDING CORP.	TAIWAN	BULK CARRIER		2	45,000					2/97	49
PACIFIC BASIN S.	HONG KONG	SHANGAI SHIPYARD	CHINA	BULK CARRIER		2	24,000					6/96	
PRECIOUS SHIPPING	THAILAND	CHEUNG KU MARINE IND.	KOREA	BULK CARRIER		4	18,000					9/98	90
REGENCY TANKER		HITACHI	JAPAN	BULK CARRIER		1	307,000					1/97	
STEPHENSON CLAIKE SHIPPING	U.K.	PT PAL	INDONESIA	BULK CARRIER		1	18,000					12/96	
TUNG GROUP		KADHSUNG	TAIWAN	BULK CARRIER	CAPESIZE	2	165,000					9/97	89
C Y TUNG GROUP	CHINA	CHINA SHIPBUILDING CORP.	TAIWAN	CONTAINER		1	1,100					9/97	
CONTAL SHIPPING-GERMAN	SWITZERLAND	VOLKSWERFT STRALSUND	GERMANY	CONTAINER		7	1,122	14,580					
CP OPEN	GERMANY	FLENER WERFT	GERMANY	CONTAINER		1	2,000	30,300					
CSAV	CHILE	SCZECIN	POLAND	CONTAINER		1	1,700	22,900				6/97	51.1
CHILENA DE NAVIGACION	CHILE	SCZECIN	POLAND	CONTAINER		2	1,700	22,900				9/97	
ELITE SHIPPING	DENMARK	AARHUS	DENMARK	CONTAINER		4	8,500					9/97	96
GEARBULK	NORWAY	GDANSK	POLAND	CONTAINER		2	49,000					9/97	
GEOR PETERSEN	GERMANY	GDANSK	POLAND	CONTAINER		1	1,900	30,300				9/97	35
GREY UNION GROUP	TAIWAN	CHINA SHIPBUILDING CORP.	TAIWAN	CONTAINER		3	1,100	18,200				6/97	71.4
HYUNDAI A&N	KOREA	HYUNDAI	KOREA	CONTAINER		2	5,012						
KLAUS JURGENS	GERMANY	SCHNEPSWERT K	GERMANY	CONTAINER		1	545	7,000					
KREY SCHIFFAHRT GmbH	GERMANY	JINAGYANG	CHINA	CONTAINER		8							
LITO NAV.		GDANSK	POLAND	CONTAINER		1			42,800				
NAVIERA DE ODEIL	SPAIN	ASA	SPAIN	CONTAINER		2	970						
RCL		MITSUBISHI	JAPAN	CONTAINER		2	1,400	17,000					
SAPPO NAV.		GDANSK	POLAND	CONTAINER		1			42,800				
SCHOLLER HOLDIN		GDANSK	POLAND	CONTAINER		3			22,800				
BOTANY BAY SHIPPING	UK	ASA	SPAIN	CHEMICAL		1		19,000					
FINAVAL	ITALY	NEA	ITALY	CHEMICAL		1		40,000					
J.O. TANKERS		ASA	SPAIN	CHEMICAL		2		19,000					
OJI PAPER		SANOYAS	JAPAN	CHIP CARRIER		3		49,000					
JAN DE MUL NV		IHC	NETHERLANDS	DREDGER		1			18,000				
DUTCH INTEREST	NETHERLANDS	SCHNEPSWERT K	NETHERLANDS	FEEDERSHIP		2	207	2,800					
CORSICA FERRIES	ITALY	INMA	ITALY	FERRY		2				550 pax, 150 car.			
EMERAUDE LINES	FRANCE	KVAERNER FJELLSTRAND	NORWAY	FERRY	CATAMARAN	1				430 pax, 52 car.			20
OCEAN BRIDGE INVESTMENT	ITALY	FINCANTIERI	ITALY	FERRY		1				600 pax, 170 car.			
SIDNEY FERRIES	AUSTRALIA	NAVAMASTER	AUSTRALIA	FERRY		1				250 pax, 49 car.			
SNCM	FRANCE	LEBOUX ET LOTZ	FRANCE	FERRY		1				500 pax, 148 car.			28
TRANSUR A. DO BRASIL	BRAZIL	KVAERNER FJELLSTRAND	SINGAPORE	FERRY		2				441 pax.			11/95
YUET HING MARINE	HONG KONG	AUSTAL SHIPS	AUSTRALIA	FERRY	CATAMARAN	1				355 pax.			10
EDU J. ANDREASSEN & SONN		SOLSTRAND	NORWAY	FISHING		1							
NISA TRAWL		SOVIKINES VAERFT	NORWAY	FISHING		1							
QAJAD TRAWL	GREENLAND	STERKORDER	NORWAY	FISHING	STERN TRAWLER	1		1,923					
REDEFFE/SABLOEN	NORWAY	EDSVIK SKIPPSTYGERI	NORWAY	FISHING		1							
FILINTER GROWING		FERUS SMIT	NETHERLANDS	GENERAL CARGO		3		4,400					
LANGSHIP		J.J. SIETAS	GERMANY	GENERAL CARGO		3		5,300					
MONTANA SHIPPING	GERMANY	FERUS SMIT	NETHERLANDS	GENERAL CARGO		1		4,200					
WAGENBORG	NETHERLANDS	FERUS SMIT	NETHERLANDS	GENERAL CARGO		2		9,000					
SLOMAN NEPTUNE	GERMANY	APPELDORE	UK	LPG		1		5,500			5,600	7/97	22.8
RCCL	US	CHANTIERS DE L'ATLANT.	FRANCE	PASSENGER	CRUISE	1		75,000	2,400 pax				280
GRIMALDI	ITALY	FINCANTIERI	ITALY	PTC		3		26,000	4,700 car				180
GRIMALDI	ITALY	FINCANTIERI	ITALY	PTC		2		18,500	4,000 car				110
KALAIPIEDA TRANSPORT	LITHUANIA	AARHUS	DENMARK	REEFER		4		5,500			300,000 cu. ft.		92
S. KORAEN GOVERNMENT	KOREA	ULSTEIN VERFT	NORWAY	RESEARCH		1							
CHARTERFRAKT AB	SWEDEN	KARLSKRONA	SWEDEN	RORO		1		5,500					
GULF OFFSHORE NS	UK	BRATTVAG SKIPPVERFT	NORWAY	SUPPLY	PSV	2		2,700					9/97
J. OSTENSJO	NORWAY	BRATTVAG SKIPPVERFT	NORWAY	SUPPLY	PSV	1		4,500					9/97
RIEBER SHIPPING		IANGSTEN	NORWAY	SURVEY		1							
AMERICAN HEAVY LIFT	US	AYONDALE	US	TANKER		4		38,289					70
AMPFC	EGYPT	HYUNDAI	KOREA	TANKER		2		153,000					
BOTANY BAY-LLOYD'S BANK	AUSTRALIA-UK	JULIANA	SPAIN	TANKER	CHEMICAL	1		19,000					104
FINAVAL	ITALY	NUOVI CANTIERI	ITALY	TANKER	PRODUCTS	1		40,000					
J.O. TANKERS	NORWAY	JULIANA	SPAIN	TANKER	CHEMICAL	2		19,000					148
MALAYSIAN INT. SHIPPING CORP.	MALAYSIA	HYUNDAI	KOREA	TANKER	CHEMICAL	1		8,000					18
MALAYSIAN INT. SHIPPING CORP.	MALAYSIA	HYUNDAI	KOREA	TANKER	CHEMICAL	1		8,000					18
MARNAV/LEODI GROUP	ITALY	SEC	ITALY	TANKER	CHEMICAL	2		14,000					9/97
OSPREY MARITIME	SINGAPORE	HALLA	KOREA	TANKER	PRODUCTS	1		46,000					33
RED BAND	NORWAY	HARLAND & WOLFF	UK	TANKER	SUEZMAX	1		146,000					10/96
SEABULK	NORWAY	IMABARI	JAPAN	TANKER		1		107,000					42
SUMMOTO	JAPAN	ONOMICHI	JAPAN	TANKER	PRODUCTS	1		45,000					9/96
UNICORN LINES	SOUTH AFRICA	SCZECIN	POLAND	TANKER		1		39,600					6/97
VAN OMMEREN	NETHERLANDS	HALLA	KOREA	TANKER	PRODUCTS	2		45,000					30
VARNINA CORP.	GREECE	CHERKIDORSKY	UKRAINE	TANKER		9							
DANNEBERG REDERI	DENMARK	AGABAMA SHIPYARD	US	TANKER	CHEMICAL	3		16,000					8/97
FRED DAHL	US	NICHOLS	US	TUG		1							8/95
HOWARD SMITH TOW. & SALV.	AUSTRALIA	MCTAY MARINE	UK	TUG		1							9/97
HYDE MARINE INC.	US	ATLANTIC MARINE INC.	US	TUG		1							9/97
NAVIX LINE	JAPAN	OSHIMA	JAPAN	WOOD CARRIER		1							11/96
SHINWA KAIUN KAISHA	JAPAN	SHIN KURUSHIMA	JAPAN	WOOD CARRIER		1							12/96



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Circle 274 on Reader Service Card

# Diesel Power Annual

*Always pressed to improve performance and quality while lowering emissions and costs, diesel engine manufacturers as a group provide a good overview of business in the '90s. This year's Diesel Power Annual provides the latest news and developments from many of the top suppliers. For additional information from individual manufacturers, please circle the appropriate number on the Reader Service Card in this issue (or use the 'Fast Fax' form on page 77).*

## **Krupp MaK Maschinenbau GmbH**

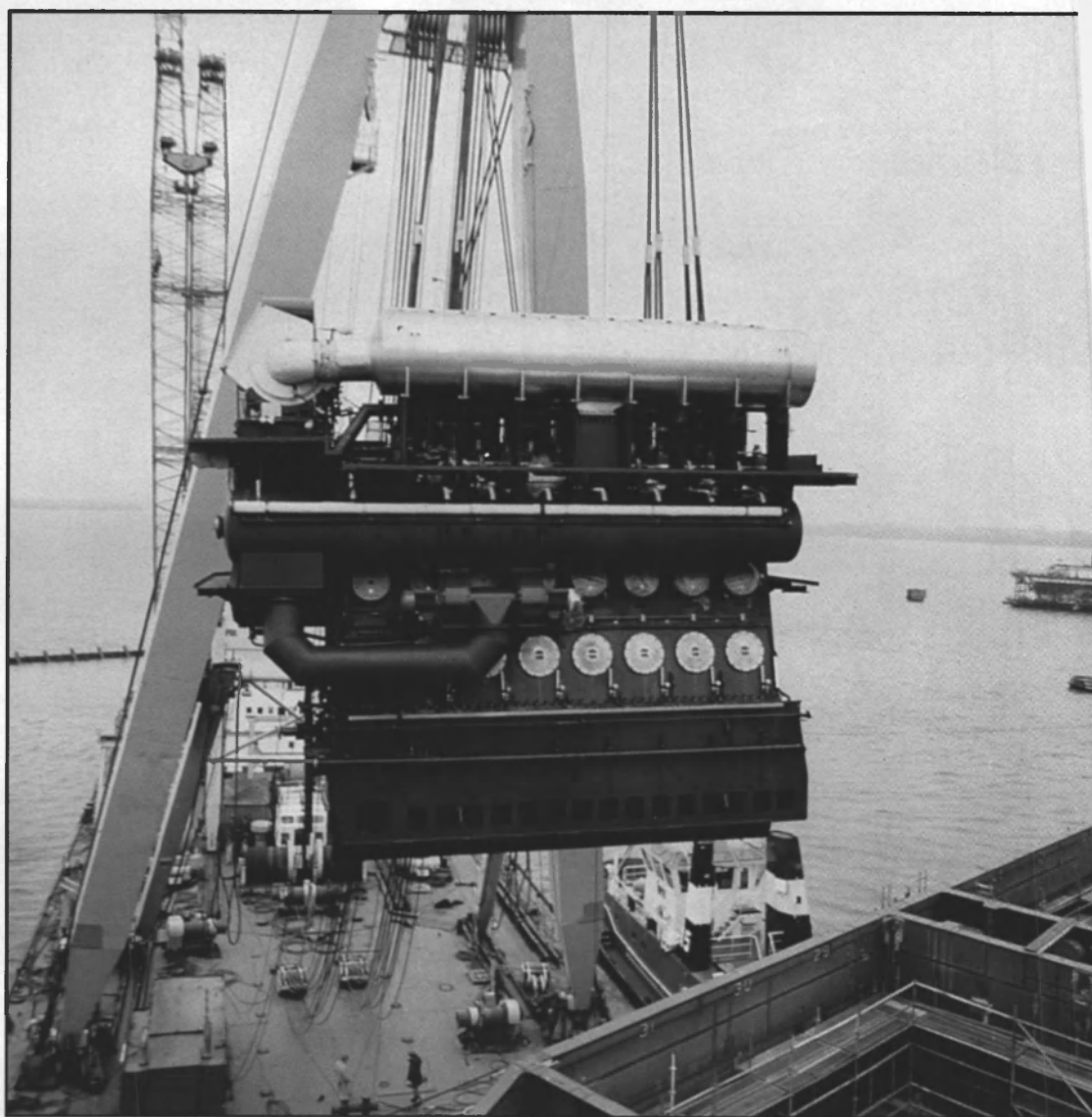
With its range of high quality medium-speed diesel engines, Krupp MaK ranks among the world's leading marine engine manufacturers. MaK's engine program comprises six series, covers a power bracket from 930 to 10,000 kW, and is tried and tested for operation on heavy fuel oil. MaK engines propel ships, drive shipboard generating sets, and produce reliable power for power stations worldwide. The company has introduced DIMOS, a computer-aided maintenance and spare part management system that runs on PC software, enabling operators to check four areas: maintenance; material management; statistics; and budget control.

For more information on Krupp MaK  
Circle 117 on Reader Service Card

## **Wärtsilä Diesel**

The Wärtsilä Diesel Group is a mainly European-based manufacturing group that produces propulsion systems for ships and heavy vehicles, as well as systems for marine-based electric generation and cogeneration. The company is a leading manufacturer of high speed diesel engines and medium speed diesel engines in the output range of over 300 kW. Wärtsilä R&D emphasizes heavy fuel and high pressure gas technology, emissions control, and the development of high performance, heavy duty engines with low maintenance requirements. Among the company's best selling diesels is the Wärtsilä Vasa 32, a medium speed engine that reportedly operates on a range of fuels, from low grade heavy fuels to natural gases. The 32 model has a patented pressure lubricated piston skirt and hydraulic tools for easy maintenance.

According to the company, it has commenced production of an environmentally-conscious multi-fuel technology for floating production vessels. Wärtsilä representatives said that with



The mounting of a complete 7S50MC into the engine room of a containership, type VW1100.

the company's new GD technology, natural gas and crude oil can be used as vessel fuel directly from wells. The technology was designed to provide for minimal NOx emissions due to increased fuel efficiency, and to reduce the operational costs of a vessel by decreasing overall maintenance needs and increasing lengthening maintenance intervals.

For more information on Wärtsilä Diesel  
Circle 118 on Reader Service Card

## **MAN B&W Diesel AG**

MAN B&W is a wholly owned subsidiary of MAN Aktiengesellschaft, Munich, Germany, and is a leading manufacturer and designer of two-stroke and four-stroke diesel engines and turbochargers. MAN B&W Diesel has facilities in Augsburg and Hamburg, Germany; Copenhagen, Frederikshavn, and Holeby, Denmark, as well as more than 30 licensees around the world. In addition, MAN B&W has a service network of agencies at more than 125 locations worldwide. At Augsburg, medium-speed diesels with a power range of 450 to 18,900 kW (610 to 25,740 hp) are manufactured, as well as spark-ignited gas engines and dual fuel engines with ratings ranging from 405 to 16,200 kW (550 to 22,000 hp), and

sophisticated, high efficiency exhaust gas turbochargers for two-stroke and four-stroke engines.

The latest four-stroke engine development of the well-proven medium-speed family, the 32/40, was extended by a V-version (12, 14, 16 and 18 cylinders) and now covers the power range from 2,200 to 7,920 kW (3,000 to 10,800 hp).

Dual-fuel and spark-ignited gas engines have become of vital importance in view of the increasing availability of gaseous fuels and their excellent environmental compatibility. MAN B&W Diesel designs and builds such engines in close cooperation with the American engine builder Fairbanks Morse Engines, a division of Coltec Industries, Inc. Fairbanks Morse Engine will also obtain licenses for MBD's Diesel engine technology. The licensing and joint development agreements will enable them to manufacture products for supply to specific U.S. government and stationary markets in North America.

Development of large medium-speed four-stroke engines has focused on improvements in economy and reliability. Emphasis was placed on the reduction of production and operating costs, and on ensuring longer lifetimes and maintenance intervals for important wear parts.

For more information on MAN B&W  
Circle 101 on Reader Service Card

Maritime Reporter/Engineering News



### Perkins Marine Power

Perkins has a comprehensive line of marine engines. Through its acquisition of Dorman Diesels in 1994, the company has further strengthened its product lineup, which now includes engines up to 1,970 bhp. Perkins Sea King engines form a range of purpose designed, turbocharged marine engines internationally proven in applications across the world. In 1992, the Sea King 16 (up to 1,528 bhp) and Sea King 16 (up to 1,970 bhp) V-form engines were launched to complement the existing six and eight cylinder in-line models (up to 985 bhp). Sea King engines now form a seamless range, covering the powerband 300-1,970 bhp. The Sea King range is suitable for, and internationally proven in, main propulsion, auxiliary, marine generating and pump applications throughout Europe, Scandinavia and the Far East. In Europe, Sea King engines have proven a particular success in fish-boat, workboat and inland waterways applications, such as ferries and dry cargo ships.

For more information on Perkins  
Circle 102 on Reader Service Card

### S.E.M.T. Pielstick

A Japanese shipowner Shin Nihonkai Ferry has ordered two 173,000 ton ferry liners from the shipyard Iwakawajima Harima Heavy Industries (IHI) in Tokyo. The maximum speed of the liners will be 30.8 knots. The propulsion machinery is composed of two 18 PC4.2B diesel engines running on heavy fuel, manufactured by Diesel United in the AIOI factory. The unit output is 13,850 kW at 410 rpm. Each engine will drive a controllable pitch propeller through a IHI planetary reduction gear and a Geislinger elastic coupling. Each engine, weighing 168 tons, will be installed on 20 resilient pads made of rubber to reduce hull vibrations and increase the passengers' comfort.

For more information on S.E.M.T.  
Circle 102 on Reader Service Card

### GEC Alsthom Diesels

GEC Alsthom Diesels offers high speed medium-speed engines for marine propulsion and auxiliary generating requirements. GEC Alsthom Paxman Diesels manufacture compact high-speed diesel engines, suitable for high speed marine craft propulsion, marine power generation as well as offshore and industrial power general applications. The Paxman range currently covers the 560-3,710 kW (750-4,973 bhp) power band.

GEC Alsthom Ruston Diesels manufactures a comprehensive range of medium speed diesel engines providing reliable and economical main propulsion and auxiliary power for a variety of vessels including offshore patrol boats, minesweepers, corvettes, tugs, ferries, supply boats, fishing vessels, coasters and high speed catamarans. The Ruston series of engines

has a power range from 750 to 6,875 Kw (1,005-9,220 bhp).

For more information on  
GEC Alsthom Diesels  
Circle 110 on Reader Service Card

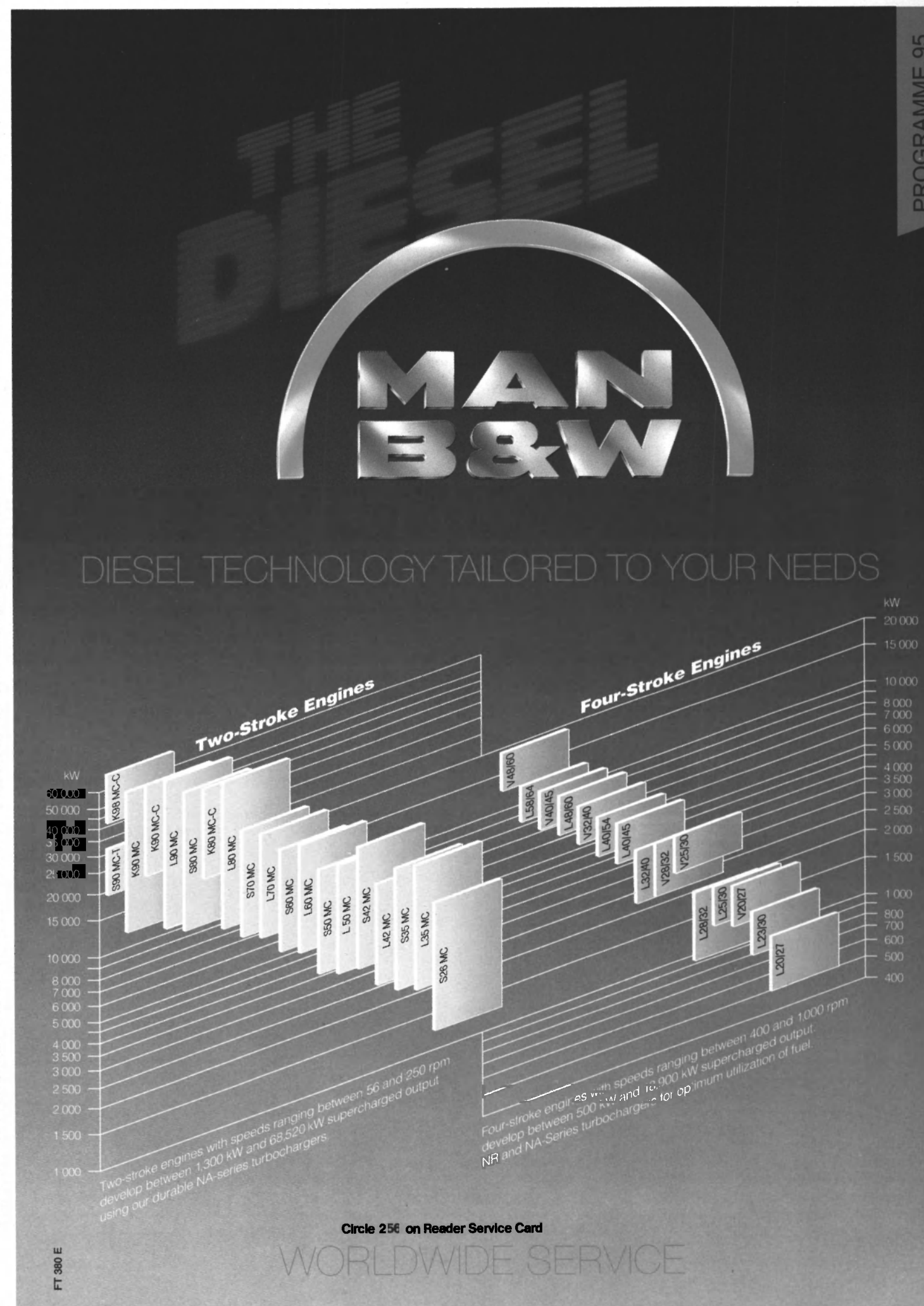
### Caterpillar Inc.

Caterpillar continues to refine and develop its offering of engines for

the marine market. Of most significance to the workboat market is the addition of the 3500 Series B engines. Caterpillar took a top selling family of engines and strengthened them to handle electronics and the advantages electronics offer. The mechanical 3500 engines are the No. 1 selling engines in their horsepower range, the company reports.

But electronics improve fuel efficiency and emissions levels, and provide enhanced diagnostic and monitoring capabilities.

The 3500 Series B electronically controlled engines show an average increase in power output of 17 to 30 percent while either reducing fuel consumption by as much as 15 percent with some emission reduction



Circle 256 on Reader Service Card

WORLDWIDE SERVICE

PROGRAMME 95

or cutting emissions in half to meet all current or proposed international marine engine emission regulations — and retaining current 3500 mechanical engine fuel efficiency. Basic engine components such as the block, cam, and gear train were strengthened to withstand increased internal pressures associated with added power output. Pistons, rings, injectors and aftercoolers were re-

designed to improve combustion efficiency. And engine operation and monitoring capabilities were improved with the addition of electronics.

For more information on Caterpillar  
Circle 104 on Reader Service Card

#### Dieselmotorenwerk Vulkan

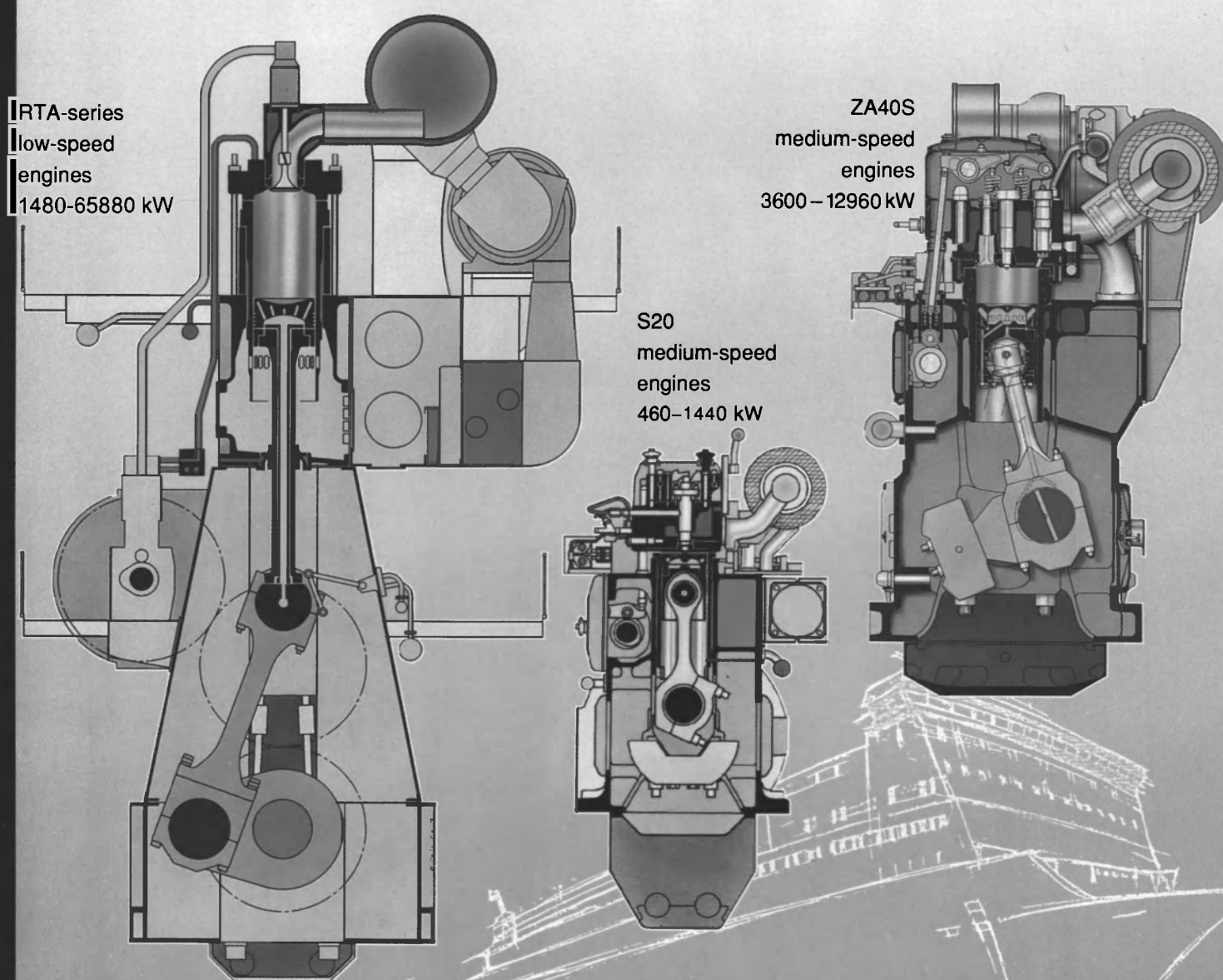
At the end of last year the engine

building works of Bremer Vulkan Werft und Maschinenfabrik GmbH were merged into Dieselmotorenwerk Rostock GmbH which subsequently changed its name to Dieselmotorenwerk Vulkan GmbH (DMV GmbH). Dieselmotorenwerk Vulkan GmbH has a long tradition in developing and producing marine propulsion units. DMV GmbH produces low-speed diesel engines

under licenses from MAN B&W, MAN Diesel A/S, New Sulzer Diesel A/S, Mitsubishi Heavy Industries works in Rostock and Bremen many. In addition, DMV supplies gears, propellers and cast iron copper alloys and cast iron. The company offers to its clients complete marine propulsion units for main propulsion.

For more information on  
Dieselmotorenwerk Vulkan  
Circle 107 on Reader Service Card

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Circle 305 on Reader Service Card

#### Deutz MWM

Deutz MWM, for which Motorenwerke Mannheim AG is the management company, forms part of KHD Division Engines and Engine Systems. It develops, produces and delivers internal combustion engines under the trademark Deutz MWM. Its range of medium-speed and high-speed engines includes four-stroke diesels engines covering a power spectrum up to 7,400 kW. Main applications of the high-speed engines are high-speed vessels such as fast ferries, naval and auxiliary craft, yachts, and gensets. The Deutz MWM program will be supported in the service sector by Deutz Service International GmbH, which is in the KHD Division responsible for service sales, parts logistics and service engineering.

For more information on Deutz MWM  
Circle 109 on Reader Service Card

#### Daytona Marine Engine

Daytona Marine Engine Corp., owned by the designer of successful high performance diesel engines since 1968. The Daytona marine diesel engines are a complete line of engines offering horsepower ratings from 90 hp to 925 hp in heavy-duty, commercial, medium-duty commercial and pleasure craft ratings.

Careful design attention has reduced maintenance time and parts cost on all of the Daytona Marine Diesels. For example, there are no zinc anodes required in any Daytona Diesel. No expensive hoses are used in the raw water cooling system. The plumbing is long life 316L stainless steel tubing. All heat exchangers, intercoolers, and oil coolers are made exclusively of 316L stainless steel and cupronickel where they contact raw water. The Daytona engines are protected with Imron paint to help combat rust and corrosion.

For more information on Daytona  
Circle 111 on Reader Service Card

#### Alaska Diesel Electric

Northern Lights marine generator sets (5-708 kW) and Luger propulsion diesels (67-1,300 hp) are made in Seattle, Wash., by Alaska Diesel Electric.

Northern Lights generator sets are all based on four cycle, fresh water cooled diesels, and feature automatic voltage control. All sets are thoroughly tested at the factory. Customization and challenging applications are Northern Lights' specialty.

Maritime Reporter/Engineering News

# MaK

## M 32

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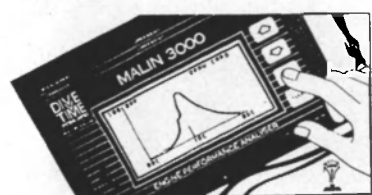
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Lugger diesels are also all f cycle and fresh water cooled. TI are particularly popular with cc mercial fishing and passenger v sels in high hour applications.

Interesting projects include: triple screw Mississippi pushbc with Lugger 12V140As; three i boats featuring four Lugger each i Alaska touring; and the launch the private yacht *Double Have* which features three 125 kW Nortl ern Lights M6108As.

For more information on Alaska Diesel Circle 112 on Reader Service Card

**Westinghouse To Perform Diesel Engine Testing For USCG Icebreaker**

Westinghouse's Marine Division, Sunnyvale, Calif., is scheduled to begin testing of the first of four 12-cylinder, 10,600-hp Sulzer ZA40S medium-speed diesel engines for the U.S. Coast Guard's (USCG) new polar icebreaker, *Michael A. Healy* (WAGB-20).

The remaining three engines, built under a \$14.5 million contract from Avondale Industries, will be completed by the end of September. The finished engines will be completed ahead of the ship construction schedule and will be stored until 1996. Delivery of the ship is scheduled for 1998.

"The first engine test will be two to three weeks in length and the subsequent engines will be tested for about a week," said **Jack Orme**, Westinghouse Marine's Diesel Programs Manager. The first article cycle test on the the first engine will consist of running 20 individual eight-hour tests.

The engines are being manufactured by Fincantieri's Diesel Engine Division in Trieste, Italy. Westinghouse has also proposed that the same engine model be used in the Navy's LPD-17 amphibious assault ships. To date, more than 176 of the 269 Sulzer ZA40S medium-speed diesels ordered have been delivered.

For more information on Westinghouse Circle 121 on Reader Service Card

**Deere Power Systems Group**

Deere Power began in 1918 when John Deere purchased the Waterloo Gasoline Engine Company. In 1949, the first John Deere diesel-powered tractor was introduced. In the early 1970s, the John Deere engine division began supplying engines directly to OEMs. Since then, OEMs have used John Deere engines for agricultural, industrial, genset and marine applications. The first factory marinized engine for commercial marine applications were introduced in 1991.

Today, engines from 70 to 300-hp are offered for propulsion and auxiliary power installations.

For more information on Deere Power Systems Group Circle 114 on Reader Service Card

Maritime Reporter/Engineering News

### Centa/Lovejoy Boosts Focus On Marine Power Transmission

Lovejoy Inc. has added a North American marine sales and service unit to its Centa/lovejoy Engineered Couplings Division, bolstering the company's support of marine power transmission industry throughout the U.S., Canada and Mexico. Lovejoy manufactures, distributes and services a line of torsional couplings, universal joint shafts, and bearing housings designed specifically for marine drive-trains on large and small vessels. The new Centaflex-DS Series dual-stage flexible couplings reportedly eliminate intermittent, low-rpm gear backlash. According to the company, the design extends the service life of reduction gears and other components susceptible to destructive vibrations. The Centaflex-DS Series couplings are available for vessels with torque ratings from 73 lb.-ft. (1 kNm) to 7,367 lb.-ft. (10 kNm).

For more information on Centa/lovejoy  
Circle 43 on Reader Service Card

### EMD

The Electro-Motive Division (EMD) of General Motors Corp. produces diesel power for marine propulsion, offshore and other industries. A complete line of GM/EMD engines is available for marine propulsion and marine generator set applications. A complete power package with engine, reverse-reduction gear or generator and accessories is available from EMD distributors worldwide. The propulsion units are also available without skid mounting for direct application to the vessel structure. For marine propulsion, EMD offers 8-, 12- and 16-cylinder Roots-Blown 645E6 Series engines and 8-, 12-, 16-, and 20-cylinder turbocharged 645F7B and 710G7B diesels. The Roots-Blown models offer a power range from 1,050 to 2,100 hp at 900 rpm. The turbocharged 710G7B engine has ratings of 2,000, 3,000, 4,000 and 5,000 hp for the 8-, 12-, 16-, and 20-cylinder models. The turbocharged engine rating range begins at 1,700 hp for the eight-cylinder 645F7B. For genset applications, EMD engines cover a continuous output range from 745 to 3,580 kW at 60 Hz-900 rpm and 570 to 2,980 kW at 50Hz-750 rpm.

For more information on EMD  
Circle 155 on Reader Service Card

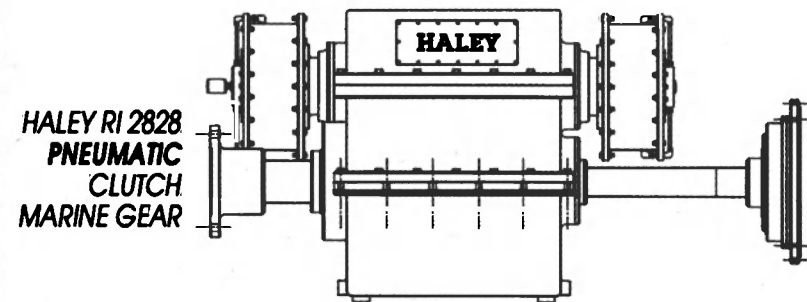
### Cummins Marine

Cummins Marine is continuing its recent pace of introducing engine products to the commercial marine industry that have been designed and built with the latest technical advancements. The addition of three new, powerful ratings for its K38 engine is a good example of the progress being made. The engine is now available at ratings of 1,300 bhp (970 kW) for medium continuous duty applications. A new Holset turbocharger, low-temperature aftercooling and a new gallery-cooled piston are among the major improvements made to the engine. Typical applications for the K38 include fishing vessels, tugs and barges, crewboats and ferries. Because of its more efficient fuel consumption (.331 BSFC at rated speed for 1,200 bhp) the engine also features a lower annual operating cost. "We have thousands of KV engines in operation worldwide, and introducing new technology is the way we reinforce our commitment to the marine market," said Paul Rabe, vice president and general manager of Cummins Marine. Cummins also offers a broad application range with available ratings from 64 to 1,384 bhp (47-1,033 kW).

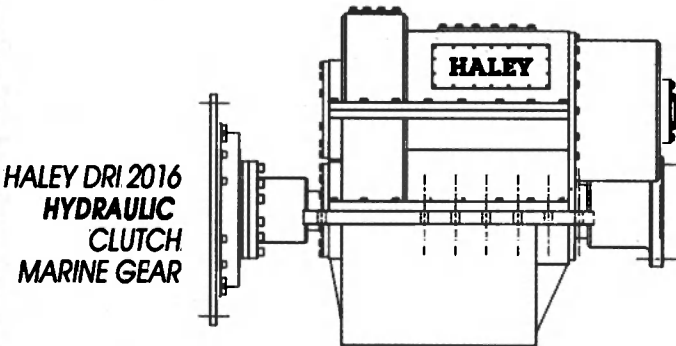
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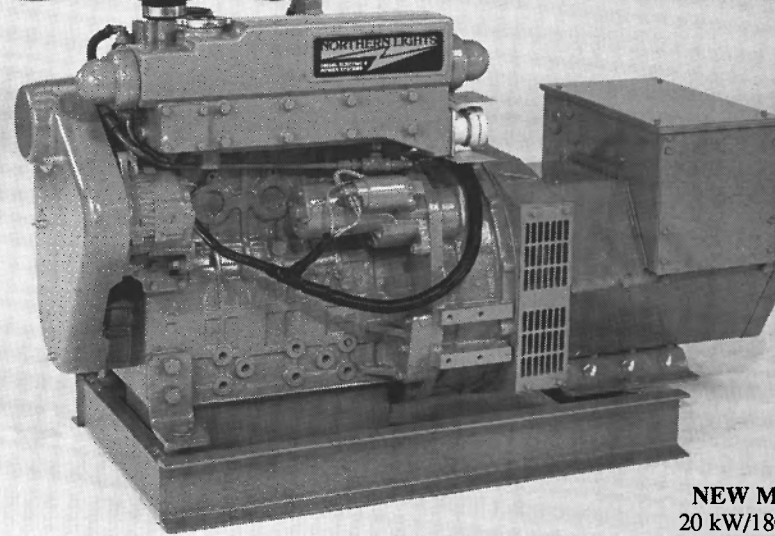
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and 99 kW.  
See your dealer  
for details.



Circle 232 on Reader Service Card

## New Engine Targets Bulk Carriers And Tankers

At the recent Nor-Shipping show in Oslo New Sulzer Diesel Ltd. introduced two new engine types to the Sulzer RTA series of low-speed marine diesel engines. The Sulzer RTA48T and RTA58T engines are specifically designed for the pro-

pulsion of bulk carriers and tankers. With cylinder bores of 480mm and 580mm, these engines have maximum continuous outputs of 1,850 and 2,720 bhp/cylinder (1,360 and 2,000 kW/cylinder) at 124 and 103 rpm respectively. Thus, in

models with five to eight cylinders, they together cover an overall power range of 5,600 to 21,760 bhp (4,100 to 16,000 kW).


The engines were designed and delivered with vessels between the size of 25,000 to 85,000 dwt in mind.

The engine ratings are within the scope of experience, with a mean effective pressures (BMEP) of about 18.2 bar, while the mean piston speed is 8.3 m/s. In effect, piston strokes were selected to maintain, with this piston speed, appropriate propeller shaft speeds for envisaged ship types.

The cylinder bores were, in turn, determined by the power output required by ships of this type and size. Much attention was paid to size and weight, and the new designs are notable for their compact dimensions. The compact dimensions will give ship designers more freedom in creating short engine rooms. This will be aided by the provision for a degree of flexibility in the fore and aft location of the turbocharger and scavenge air cooler module for best engine room arrangements. Much thought was given to extending the time between overhauls, and ease of operation and maintenance. The design objective is a time between overhauls of the principal components of 15,000 hours.


Both engines will be able to meet the IMO limits for NOx exhaust emissions that come into effect in 1997 without any additional equipment. The NOx levels are reduced simply by adapting the engine tuning. This is facilitated by the electronic variable injection timing system now standard on Sulzer RTA-series engines.

For more information from New Sulzer Diesel  
Circle 120 on Reader Service Card



**ULSTEIN**

**NEVER CHANGE A WINNING TEAM**



### THE TEAM IS THE SAME - WE HAVE ONLY CHANGED THE NAME

ULSTEIN BERGEN has developed and manufactured main engines and generating engines for ships, as well as diesel- and lean-burn gas engines for land installations since 1943. Quality in all details has always characterized ULSTEIN BERGEN products, and our workforce continues to take pride in the high level of its craftsmanship. The team is the same, we have only changed the name.

ULSTEIN BERGEN is still recognized worldwide as a manufacturer of economical, reliable medium-speed diesel engines for propulsion and generating power plants.



ULSTEIN BERGEN AS has been found to conform to Quality System standard: BS5750: PART 1, ISO 9001, EN29001: 1987.



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### Next time you think of steering -- steer to Jastram!

Seaspan International Ltd. and Sythe Shipyard Ltd. chose Jastram Steering Systems when building the 50 foot Twin Screw Tug "SEASPAN SCOUT". Jastram Marine Hydraulic Steering Systems are an ideal choice when designing a new vessel or considering a retrofit.



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## From Concept to Creation

It starts with a CAD drawing, blueprint or a shop sketch and in just minutes MTC's profile cutting software generates a CNC part program.

It's the speed and precision-focused results that have specialty fabricators, shipyards, railroads, truck/trailer and blowpipe manufacturers using a wide variety of MTC software. Consulting with our technical staff has further enhanced the performance and

productivity of their plate cutting operations.

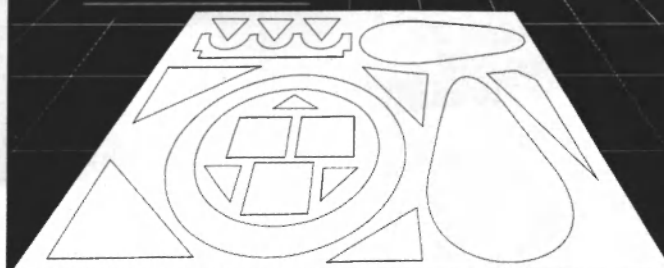
MTC software is thoroughly shop tested to assure ease-of-use and cutting edge technology. Our staff will provide you with a level of expertise unparalleled in the industry. Whether you are using plasma, fuel-gas, laser, water-jet or routers, MTC has a software solution to meet the needs of your company, large or small.



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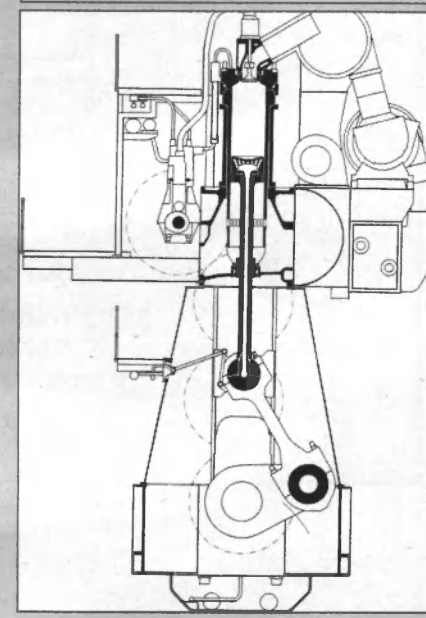
The MTC logo is a registered trademark of MTC.



Circle 300 on Reader Service Card

### Principal Engine Data

Engine type	RTA48T	RTA58T
Bore (mm)	480	580
Stroke (mm)	2,000	2,416
Power, MCR (bhp/cyl)	1,850	2,720
(kW/cyl)	1,360	2,000
Speed range (rpm)	99-124	82-103
# of cylinders	5-8	5-8
Power range (bhp)	5,600-14,800	8,150-21,760
(kW)	4,100-10,880	6,000-16,000



**Coltec O.P. Upgrade Kits  
Designed For Efficiency,  
Emission-Awareness**

Coltec Industries' Fairbanks Morse Engine Division has developed a series of upgrade kits for its P. (opposed piston) engines, focusing on improving performance and durability and reducing exhaust emission levels. Its design allows for flexibility of relative air and exhaust port timing without the need for backflow valves, and takes advantage of an open chamber in the presence of high air swirl for optimum combustion. The company reports that its O.P. engine has a two-cycle design with ported uniflow scavenging, and is utilized in primer mover heavy duty applications. The O.P. emissions reduction kits include the following unit configurations: a blower scavenged; a blower-turbo with continuous or intermittent blower; a turbo-blower series; and turbocharged air scavenging systems. Fairbanks Morse has developed specific upgrade kits for both blower and turbocharged applications, the fifth kit of each group combining and maximizing the improvement of the first four.

For more information on Coltec  
Circle 116 on Reader Service Card

**Yanmar Offers Complete  
Diesel Engine Line**

Yanmar designs and manufactures a complete line of marine diesel engines ranging from nine hp to 420 hp for recreational and light duty commercial use. The most recent additions to the line are a turbocharged, intercooled, four-cylinder 230-hp diesel and six-cylinder 350-hp diesel. Yanmar's 27-hp and 36-hp diesel outboard engines are SOLAS approved — ideal for powering rescue boats.

All Yanmar marine engines are created specifically for the marine environment. They feature low emissions, quiet operation and excellent fuel efficiency.

For more information on Yanmar  
Circle 105 on Reader Service Card

**Marine Power, Inc. Offers  
6.5 Liter Diesel**

Marine Power, Inc. of Ponchatoula, La., offers a new series of 8-cylinder diesel engines built from the 6.5 GM diesel block. It is reportedly ideal for gas to diesel repowers. The 165 hp is naturally aspirated, the 230 hp is turbocharged and the 275 hp is turbo aftercooled — all measured at 3,600 rpm at the crankshaft. The engine measures 31.5 in. high by 27 in. wide and weighs 1,000 lbs., including gear. It displaces 396 cu. in. and produces more than 350 ft.-lbs of torque from 1,700 to 3,500 rpm. Compression ratio is 18.3:1 for the turbo and turbo aftercooled model, and 22:1 for the naturally aspirated model. The diesel features indirect

injection for low emissions. Its cast iron block engine uses forged steel connecting rods and caps, cast aluminum "scuff-proof" pistons and a hardened steel roller camshaft. The cooling system's heat exchanger is equipped with a remote surge tank and low-water alarm.

For more information on Marine Power  
Circle 106 on Reader Service Card

**MTU 396 Series**

MTU's 396 Series includes 6, 8, 12, and 16-cylinder diesels, designed in "V" configurations, with power ratings from 540 to 2,560 kW. The series emphasizes a combination of maximum power, low weight and compactness. The 396TB is designed for marine main propulsion duties, and has a range of 1,920 kW to 2,560

kW. MTU's 396 marine engines employ sequential turbocharging for engines facing high power requirements in the lower and medium speed ranges, VHP fuel injection for optimum fuel atomization, and cylinder cutout to enhance combustion at idle conditions.

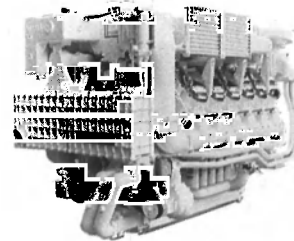
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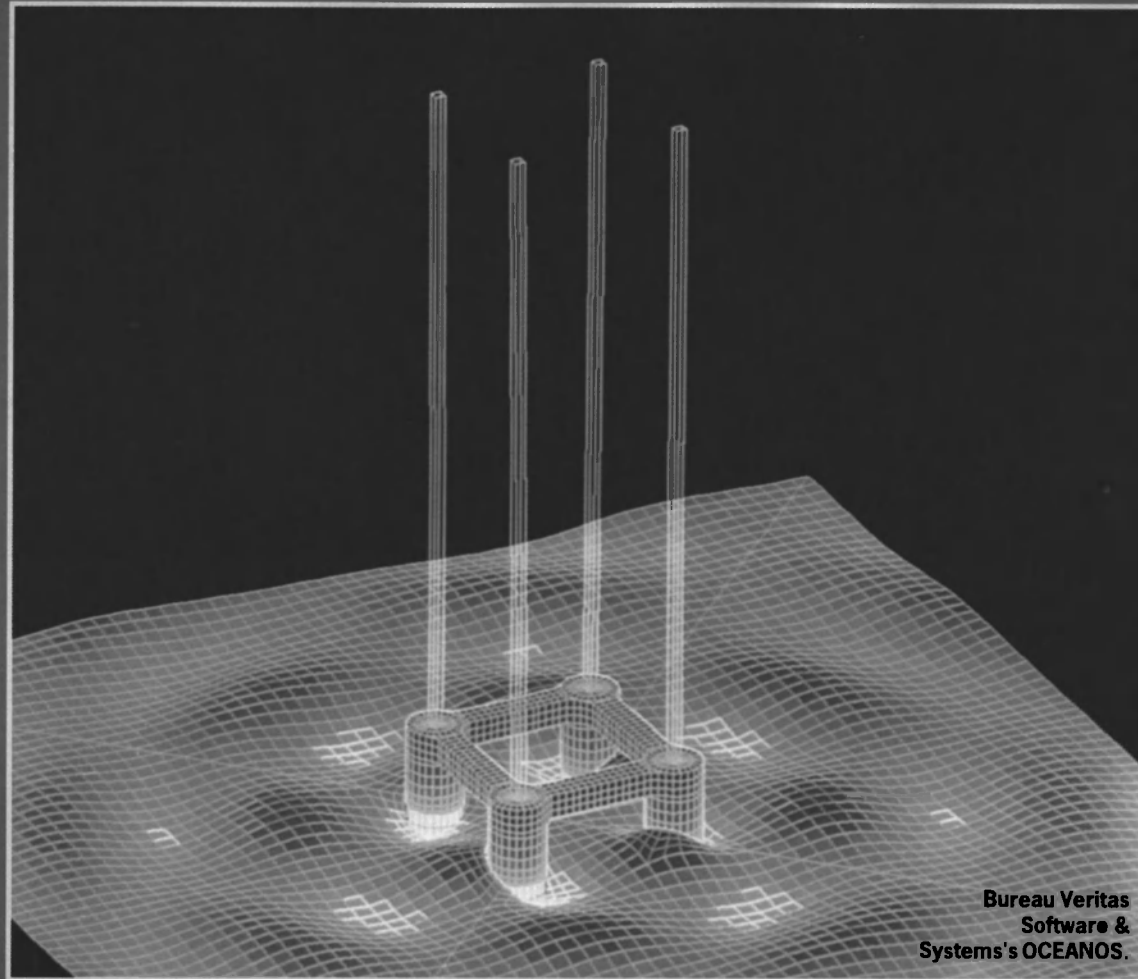
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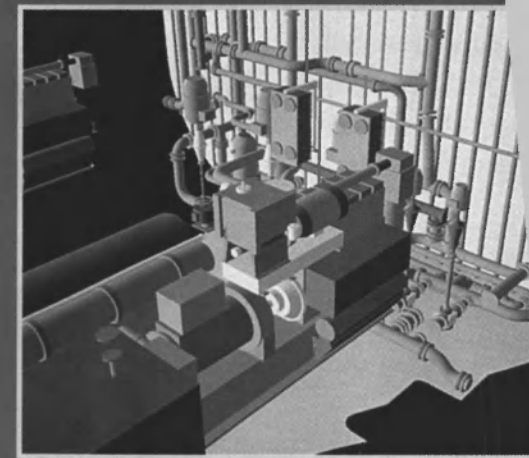
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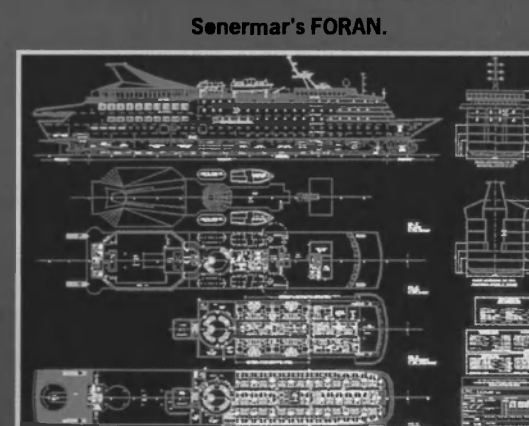
# CAD-CAM:



Bureau Veritas Software & Systems's OCEANOS.



Kockums Computer's TRIBON.



Senermar's FORAN.

## A technological key for internationally competitive yards

by Jonathan M. Ross, director of engineering, Proteus Engineering

**C**AD/CAM, as adapted for ship building applications, can serve as a catalyst and a tool to implement engineering for production methods, as evidenced by activities in European shipyards. This is the theme of the paper entitled *The Influence of Integrated CAD/CAM Systems on Engineering for Production Methodologies in Shipbuilding*, presented by **Jonathan M. Ross** and **Luis Garcia** of Sener at the SNAME 1995 Ship Production Symposium. The paper is set in the context of the U.S. shipbuilding industry, with particular focus on smaller and medium-sized yards.

European yards have recognized the strength of an integrated CAD/CAM product model, which contains ship design and production information in a single database and serves as a resource to all levels of shipyard personnel during the design and production of a ship. In particular, engineering for production has been greatly advanced in the Spanish shipbuilding industry with its adaptation of the integrated CAD/CAM approach. In many cases, the successes of European shipyards in using integrated CAD/CAM systems may be directly translatable to the U.S. shipbuilding industry, with resultant improvements in U.S. competitiveness.

### Getting (and Staying) Competitive

An important tool in reducing ship design and construction schedules and costs is engineering for production methodology. Engineering for production has been in use for many years and is continuing to be improved. A big part of this continual improvement is the use of integrated CAD/CAM systems.

Engineering for production was developed to help correct some inherent inefficiencies in shipyards, including: lack of up-front procurement definition; separate departments and ships; lack of horizontal and vertical communication; different definitions in different sectors of a shipyard of the design and of the build plan; and the need for a large amount of rework during construction.

From the very beginning of the design process, engineering for production places the emphasis on the end use of the engineering product: to help define the production of the ship. For example, the emphasis is not on systems, but rather on zones.

### Evolution Of CAD/CAM in Shipbuilding

The evolution of CAD/CAM systems in the shipbuilding industry has taken place in a relatively short time, as the birth of CAD/CAM can

be dated from the early 1970s. CAD/CAM is increasingly becoming a capability of the smaller and medium-sized yards, as well as the bigger yards.

A number of ship design CAD/CAM systems are available on the world market, including AutoSHIP, FORAN, HICADEC, HULLTECH, IMSA, NAPA, NAVSEA, CAD-2 and TRIBON. The systems, or at least the modules which comprise the systems, have evolved over a period of years and are continually improved. While different systems focus on different aspects of CAD/CAM, they typically may include elements such as concept/basic/detail design, lofting, NC cutting and input to production robots. Recent development trends include additional integration through product models, enhanced communication with third party programs, increasingly user-friendly interfaces, and the extension of program capabilities into earlier stages of design and later stages of production.

In addition, today's systems typically keep pace with the computer hardware industry, with its ever-increasing computing power packaged in smaller and smaller machines.

### U.S. Yards: Looking To Expand CAD/CAM in The Future

A survey of U.S. shipyards by the authors indicates that all yards sur-

veyed in the 500 to 1,000 employee category presently have CAD hardware and 75 percent plan to expand or replace CAD hardware in the future. Additionally, 38 percent of the yards surveyed which have more than 1,000 employees plan to expand or replace current systems, and 25 percent of the yards surveyed with between 250 and 500 employees plan to expand or replace.

In terms of presently installed or planned CAD software — such as GHS, Fast Ship or SHCP — of all the yards surveyed with between 500 and 1,000 employees, 100 percent currently have and use CAD software programs. Of the yards surveyed which have between 250 and 500 employees, 38 percent presently have, and 63 percent plan to get, CAD systems. Of the yards surveyed which have more than 1,000 employees, 38 percent presently use and 38 percent have plans to expand or replace CAD systems.

Here are some additional results from the yards surveyed.

Percentage of yards surveyed with presently installed or planned steel production software, such as ShipCom, SPADES or AUTOKON.

Employee #	Presently Use	Plan To Expand/Replace
250-500	13%	25%
500-1,000	50%	50%
1,000+	63%	63%



## AD/CAM REVIEW

Percentage of yards surveyed with presently installed integrated drafting software, such as AutoCad, station or CADAM:

Employee #	Presently Use	Plan To Expand/Replace
100	63%	13%
1,000	75%	75%
10+	88%	38%

Percentage of yards surveyed with presently installed integrated piping, HVAC or electrical design software, such as CadMatic, CSA or RAMP:

Employee #	Presently Use	Plan To Expand/Replace
500	25%	50%
1,000	25%	25%
10+	50%	63%

Percentage of yards surveyed with presently installed integrated CAM facilities, such as numerical cutting or robotic welding:

Employee #	Presently Use	Plan To Expand/Replace
1-500	25%	25%
1-1,000	100%	100%
10+	88%	0%

**Note:** The survey, conducted in mid-1994, entailed mailed surveys and follow-up telephone calls. Of the yards contacted, 20 yards — or 37 percent — responded.

### Influence On Engineering For Production

Using CAD/CAM to enhance the effectiveness of engineering for production is not a new idea. The common thread between integrated AD/CAM and engineering for production is the concept of integration. Given this common thread, the degree of influence that integrated CAD/CAM systems have on engineering for production methodologies may thus be measured by the ability of integrated CAD/CAM to help realize the integration goals of engineering for production.

Union Naval de Levante, a privately owned shipyard founded in 1924 and headquartered in Valencia, Spain, is a strong example of integrated CAD/CAM significantly enhancing a yard's engineering for production methodology. The yard, which is presently using the FORAN integrated CAD/CAM system, was introduced to computers in 1984 — and there has been significant growth of CAD/CAM every year. Since implementing and enhancing CAD/CAM, the yard has seen:

- A dramatic decrease in design time (e.g. eight people working six months versus 21 people working 18 months to develop steel construction drawings);
- A decrease in engineering time (e.g. in carrying out hydrostatic calculations by computer instead of by hand);
- The ability to quickly conduct "what-if" studies at the early stages of the project; and
- The ability to automate NC cutting of nested piece parts from steel frames. A particular area where CAD/CAM has been implemented at the shipyard, with a corresponding influence on engineering for production, is piping design and production.

July, 1995

### Bureau Veritas Introduces Advanced Structural Design Software

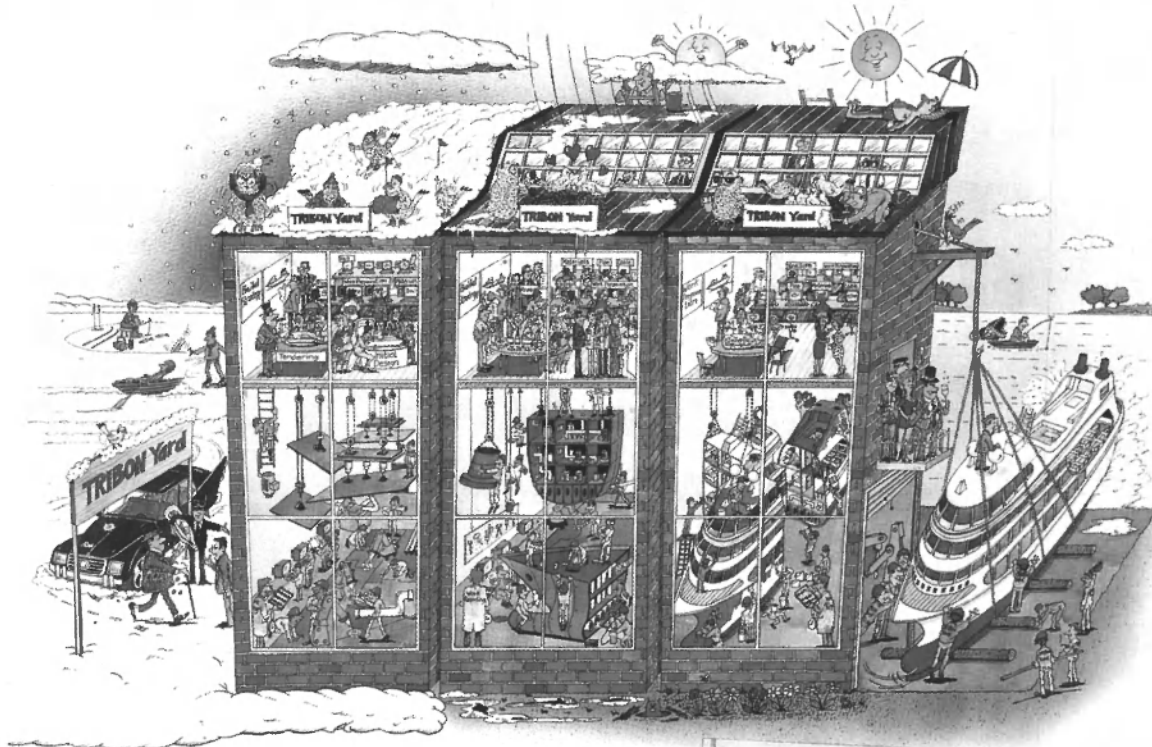
Bureau Veritas Software & Systems, a company newly formed by Bureau Veritas, has released advanced software for the engineering

design and validation of large marine structures. The company is offering a series of four state-of-the-art programs, and an integrated suite of these programs known as OCEANOS (Online Control, Engineering & Analysis of Offshore Systems). The programs are especially suited for complex design tasks involving deep water applications, and

strive to improve the safety of very large marine structures such as concrete platforms, TLPs, jack-ups, semisubmersibles, and floating production and storage systems.

For more information on Bureau Veritas Software & Systems Circle 7 on Reader Service Card

## FROM INITIAL DESIGN TO PRODUCTION with TRIBON Shipbuilding system



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Marine Engineers, Designers,  
Draftsmen, Loftsmen,  
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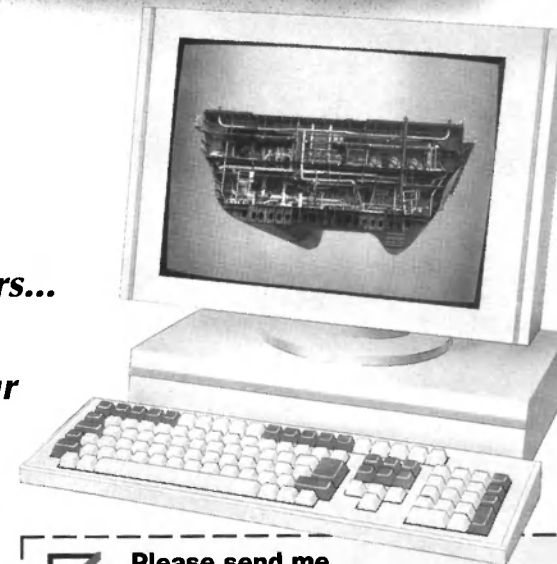
The TRIBON system is an integrated set of design and information applications built and developed solely to meet the unique needs of the shipbuilding industry, from initial design to production.

Design and information systems from KCS are currently in practical use at more than 220 sites in Australia, China, Europe, Japan, Korea, Russia, South and North America and Singapore.

**KCS**  
Kockums Computer Systems

Member of the Calixtus Group

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Please send me further information about TRIBON.

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MR7

## CAD/CAM REVIEW

### KCS Updates TRIBON

Kockums Computer Systems AB (KCS), Malmo, Sweden, has released a new version of its shipbuilding computer application, TRIBON Release 2.0.

TRIBON comprises a suite of component applications: Initial Design, Hull, Pipe, Cable, Accommodation, Structure, Components, Equipment, General De-

sign, Work Preparation, Work Reporting, Tendering, Ship Managing, Work Administration, and Main Planning.

TRIBON Initial Design (formerly MT ICON's HULLTECH) is now integrated in the TRIBON system. Hull surfaces created in TRIBON Initial Design can now be directly accessed by the TRIBON Hull application.

Recognizing the increasing use of robotics in shipbuilding, an interface for profile cutting is now also included in TRIBON, the main purpose of which is to make nested profiles available for profile-cutting robots. In the welding area, the TRIBON Robot Interface has been extended and incorporated into the Work Preparation application — so that data to support robot welding for each assembly stage can be created.

The production assembly stages can now be displayed graphically as a set of connected rectangles (assembly nodes). There are several ways to arrange these assembly nodes. For example, they can be used to show the assembly hierarchy vertically or horizontally.

Any part of the assembly hierarchy or the whole hierarchy can be displayed. By pointing at an assembly node, a pop-up menu appears allowing the user to edit the assembly hierarchy.

A new and important feature is the ability to automatically create an assembly drawing for hull structure assemblies. In addition, parts lists can be generated for each assembly stage as well as a report of weights and centers of gravity. Also, a module has been added for the creation of numeric control information and production sketches for panel lines.

User-friendliness and productivity enhancements have also been added:

- Group function allows the simultaneous update of a number of hull structure items all at once.
- New Jumbo panel splitting and splitting of stiffeners functions to break down major structural panels such as complete decks, bulkheads and smaller panels for production purposes during the design process when more details are added to the Product Information model.
- Copy and Move functions to reuse already created structural panels in new locations in a project. The improved topology in this release means that when panels are copied their topology is completely retained — so the system automatically creates the correct geometry at the new location.
- Extension to the Structure application used to define equipment foundations and miscellaneous steel, so that end cuts can be fully defined.
- Copy and Move functions in the Pipe application so that one or more pipes in a design can be re-used at a new location.
- Customer-defined attributes can now be added to the database.
- The component database interface has been improved so that the Materials application and the design applications in TRIBON can share and update the same component information on-line.

The improved user interface includes extended language support, so that "multibyte" characters of the type used in Asian countries can be used. To make TRIBON more accessible to the North American market, Imperial Units have been implemented in the pro-

gram.

The TRIBON program is currently available on the following platforms: DEC O VMS 6.1 VAX; DEC Open VMS 6.1 AIX HP9000/700 HP-UX 9.01; and IBM RS6 AIX 3.2.5.

For more information  
Circle 128 on Reader Service Card

### Intergraph: CAD By Way Of The Navy

Intergraph's suite of Integrated Ship Design and Production (ISDP) products allow the company to successfully compete in the U.S. Navy Naval Sea Systems Command (NAVSEA's) \$362 million CAD II procurement. The contract was awarded Intergraph in June 1991, and since then more than \$100 million worth of systems a services, including more than 1,000 workstations, have been installed within the NAVSI community.

Intergraph has also been expanding in the worldwide shipbuilding community. K users of Intergraph's new system include European shipbuilders such as Yarrow Shipbuilders, Gdansk Shipyard and Royal Schelde.

In the Asian Pacific region, South Korea shipyards are showing increasing interest. Daewoo and Samsung Offshore have become ISDP customers.

The first ship to be completely designed by the ISDP suite is a frigate for the Royal Malaysian Navy which was launched at the end of 1994 and is now undergoing final outfitting at Yarrow Shipbuilders in Glasgow Scotland. Major benefits have been achieved during the design and production process and Yarrow claims substantial productivity and major quality improvements, which the reportedly feel are due to the implementation of the 3-D Product Model concept.

In the 3-D Product Model, around which the ISDP system is built, graphics and data base attributes are integrated to maintain a fully associative relationship between all components in the design.

The core product in this suite of tools is the Vehicle Design System (VDS). VDS is layered on top of Intergraph's Engineering Mode System (EMS) and provides the foundation for all ship-structural and distributive systems applications. EMS is a feature-based, variational geometry-driven, solids modeling system. It contains a common, easy-to-use Graphical User Interface (GUI) that provides a consistent look and feel across the complete range of system functions — reducing training time and increasing operator proficiency.

For more information on Intergraph  
Circle 78 on Reader Service Card

### Senermar's FORAN Covers Concept Through Delivery

Senermar of Madrid, Spain, offers FORAN — a high-performance shipbuilding CAD/CAE/CAM system that covers conceptual design through construction and delivery. Senermar says FORAN increases productivity through intelligent management of the information flow.

The program is organized into the following main applications: General Design, Hull Design and Production, Outfitting Design

With every copy of NavCad™ you get an internationally recognized authority in resistance and propulsion on your desktop.



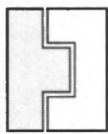
Donald M. MacPherson  
VP Technical Director  
HydroComp, Inc.



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## AD/CAM REVIEW

roduction, Drafting, and Elec- Design and Production. e program provides a solution ine a 3-D Topological Model of ip structure. Group technol- applied to define the building agy: ship structure is broken into interim products to opti- production costs.

ORAN is flexible and modular, ding to Senermar, and may be for any type of ship and adapted y size shipyard. FORAN en- es ease-of-use with a Common ict Model and the same inter- for all applications. FORAN's i-access database and topologi- roduct model allow extensive f concurrent engineering meth- in the design.

ased on modern client-server itecture, FORAN runs on open em hardware platforms. Ver- s for UNIX and Open VMS (VAX ALPHA) are available.

ir more information on Senermar Circle 79 on Reader Service Card

### droComp Announces ine Database

ydroComp, Inc. (HCI) and rld Marine Publishing, Ltd. (MP) have reached an agreement intly produce a yet-to-be-named rine engine database. The prod- would be designed for naval hitects and marine engineers, ; the companies say users of droComp's NavCad and syProp propulsion analysis soft- re packages will also find this abase useful.

This new Windows-based prod- contains all the data that can be und in World Marine Publishing's rine data publication and more. user can sort, select, transfer and erwise access a wealth of engine ormination, and at the click of a use produce NavCad and syProp engine files for direct use thin these programs.

or more information on HydroComp Circle 80 on Reader Service Card

### utoship Gives sers AUTOPOWER®

AUTOPOWER® is a new Win- ws-based computer software sys- m from Autoship Systems Corpo- tion for ship resistance and pow- ing prediction. AUTOPOWER rovides naval architects and de- gnars with resistance and power rediction methods for displace- ent, planing, semi-displacement nd catamaran vessels. It report- dly meets the day-to-day needs of esigners who deal with routine or otic problems in resistance and ropulsion calculation. Up to five ifferent hull alternatives can be onsidered simultaneously, faci- ating comparative design studies nd optimization. High-quality

graphs and tables can be displayed on screen or printed for customized reports.

The new Windows interface, according to Autoship, integrates all the necessary functions for resistance and power prediction into an easy-to-use and flexible process, taking the designer from concept

through final design in a few simple steps. All input variables are presented in a Windows spreadsheet-like format, allowing easy modification to allow a wide range of parametric studies.

Fourteen different methods of resistance determination are used, all of which have been verified and

tested using approved tank methods and empirical studies. Propulsion efficiencies are calculated according to the Wageningen B-series or Gawn-Burrill KCA series polynomials.

For more information on Autoship Systems Circle 81 on Reader Service Card



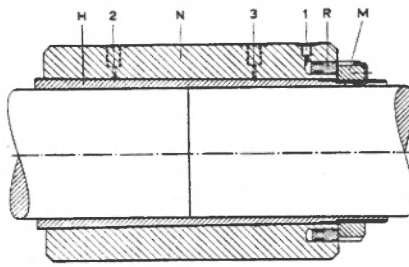
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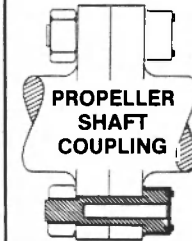
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#### MORGRIP® BOLTS

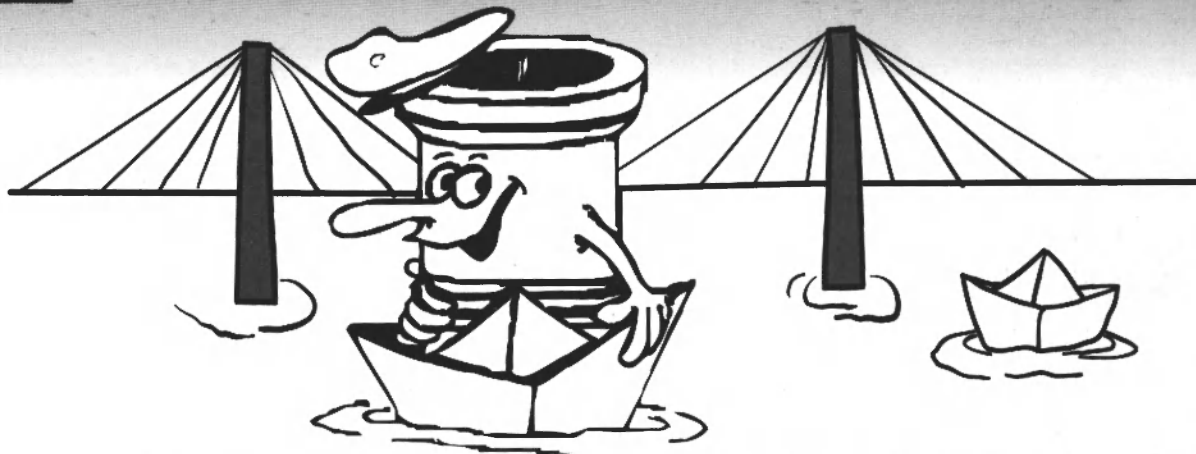
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Circle 229 on Reader Service Card

**Hitachi Zosen Delivers Bulk Carrier  
Panagiotis A**



Hitachi Zosen Corporation built the *Panagiotis A*, a bulk carrier with deadweight of 71,550 metric tons, for Francis Shipping Corporation at its Maizuru Works. The carrier was completed and delivered to its owner in late April. The vessel is the seventh of the Panamax Optima type which Hitachi Zosen developed for passage through the Panama Canal. It can carry a variety of cargoes including grain, ore and coal. The vessel is equipped with an energy-efficient Hitachi Zosen MAN B&W 6S60MCE type

diesel as the main engine. Propulsion efficiency is reportedly enhanced by the Hitachi Zosen Super Stream Duct at the vessel's stern. For more information on Hitachi Zosen Circle 31 on Reader Service Card

**Panagiotis A Particulars**

Length	705.4 ft. (215 m)
Breadth	105.6 ft. (32.2 m)
Depth	61 ft. (18.6 m)
Summer load draft	44.2 ft. (13.46 m)
Deadweight	71,550 metric tons
Gross tonnage	38,131
Main engine	HZ MAN B&W 6S60MCE diesel
Max. trial speed	16.31 kn
Complement	27 persons
Classification	ABS



*Laramie*, a Navy fleet oiler recently christened at Avondale

**Final Avondale Fleet Oiler Christened  
*Laramie***

T-AO 203, the 16th and final fleet replenishment oiler Avondale Industries, Inc. is building for the U.S. Navy, was christened *Laramie* at Avondale's main yard. T-AO 203 is also the third fleet oiler to be

double-hulled by Avondale, which reportedly built the first three double-hulled vessels in U.S. The previous two oilers designed and constructed with a double hull at Avondale: *Patuxent* (T-AO 201) and *Rappahannock* (T-AO 204). The sponsor for T-AO 203 was Mrs. **Lyon Deutch** of Washington, D.C. Her husband, the Honorable **John M. Deutch**, deputy secretary of defense, was the principal sponsor. Dr. Deutch has been nominated to be director of the Central Intelligence Agency.

**STEEL-SPRING FLEXIBLE COUPLINGS LO-REZ**



HF (HUB-FLANGE) ARRANGEMENT

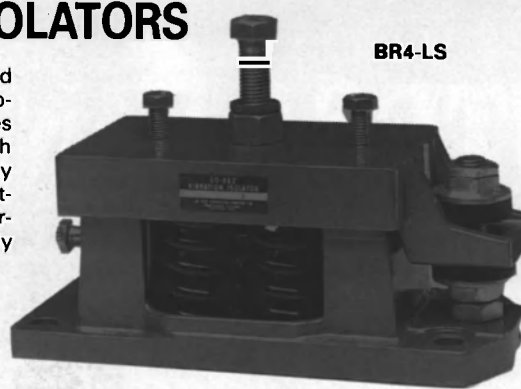
LO-REZ helical steel-spring couplings, with their low, constant and accurately-controlled torsional stiffness factors, provide excellent torsional characteristics for geared marine reciprocating propulsion systems, engine and reciprocating compressor drives of many varieties, locomotive drives, etc.

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LO-REZ manufactures a broad line of sturdy steel-spring vibration isolators. The **BR** series isolators (shown here) with their ample thrust capacity and rubber-cushioned, adjustable stops (to limit excess vertical excursion) are widely used for marine auxiliary, other mobile and seismic applications. No external chocks are required. **BR-T** series isolators have special spring-loaded thrust housings to carry the full propeller thrust effects, the full engine torque, and still provide excellent isolation. They are ideal isolation supports, also, for machinery rafts in ships.

With the growing demand for acoustical and vibration attenuation treatment in ships, the isolation of main propulsion engines is fast becoming a necessity rather than a luxury. LO-REZ has many years of experience in analyzing the dynamics of soft-mounted propulsion engines, and has the products to provide integrated isolation systems which include two-directional thrust-type **RT** flexible couplings for the gear output shaft.

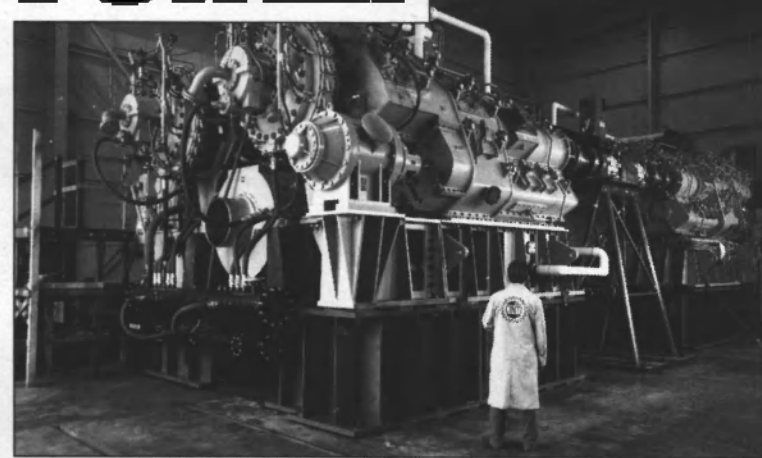


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marks were delivered by Secretary of the Navy **John H. Dalton**, Rear Admiral **Lewis A. Brown**, USN, deputy commander for engineering and chief engineer, Naval Sea Systems Command; Rear Admiral **John H. McKinley, Jr.**, USN, Reserve, commander, Military Sealift Command, Europe (Mobilization); Captain **Jeffrey Perin**, supervisor of Shipbuilding, Conversion and Repair, New Orleans; and **Albert L. Sier, Jr.**, chairman, president and CEO of Avondale Industries, Inc.

The mission of *Laramie* and other ships in the series is to transport bulk products from shore to combatants and support forces under fire. The ships also deliver fleet freight, cargo, mail and personnel.

The new ship is approximately 668 ft. (203.6 m) long and has a beam of just over 97 ft. (29.6 m), with a maximum draft of 36 ft. (11 m). Cargo capacity is 159,500 barrels of oil, and the ship is capable of simultaneously receiving, storing and charging two separate grades of cargo fuel. Powered by twin 10-cylinder medium-speed diesel engines, *Laramie* will be capable of service speeds of up to 20 knots. The twin-screw propulsion design provides the vessels with improved directional stability, ease of control and mission reliability under combat conditions. *Laramie's* scheduled for delivery in mid-1996.

For more information on Avondale  
Circle 35 on Reader Service Card

#### Trinity Delivers Fast Ferry To Virgin Islands Operator



Aluminum Boats, Inc., of the Trinity Marine Group, delivered the 95-ft. (28.9-m) high-speed aluminum ferry *Caribe Cay* to Transportation Services of St. John in the U.S. Virgin Islands. The 30-knot, 276-passenger ferry is the third built by Trinity shipyards for the Virgin Islands tour and ferry operator. *Caribe Cay* was preceded by the triple-screw ferry *Caribe Time* in January of 1979 and the 85-ft. (25.9-m) quad-screw ferry *Caribe Tide* in August 1988. The company also operates several Trinity-built vessels which were purchased used.

Overall, *Caribe Cay* is 95 ft. long, with a 24-ft. (7.3-m) beam and a 9.6-ft. (2.9-m) depth. Loaded draft is 5.5 ft. (1.7 m). The vessel can carry approximately 2,800 U.S. gallons of fuel and 250 gallons of potable water.

*Caribe Cay* is powered by five Cummins KTA19M3 diesel engines driving Twin Disc reverse/reduction gears with a 1.92:1 ratio. Each engine produces 700 hp at 2,100 rpm. Electrical power is produced by two Cummins 30-kW generators and the boat is equipped with two hydraulic steering stations.

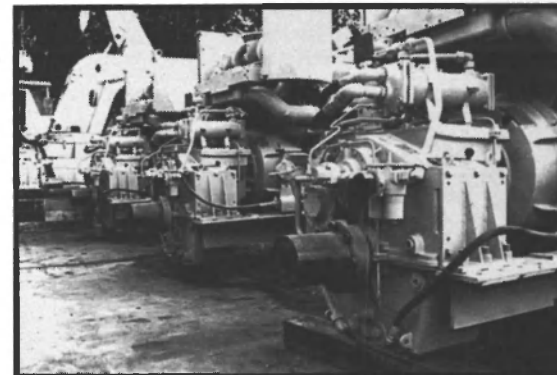
Transportation Services of St. John was founded in 1960 by **Loredon Boynes** and his wife, who established the first ferry service in the Virgin Islands. **Vashti Boynes**, widow of the late **Loredon Boynes, Sr.**, christened the ferry in New Orleans. The vessel departed the city soon after and made the approximately 1,800-mile trip to St. John in two days and 17 hours.

For more information on Trinity  
Circle 32 on Reader Service Card

#### Engine Rebuilds To Repeat Customer

Pan American Power, Inc. of Covington, La., recently sold 12 rebuilt Caterpillar D398 engines with new Reintjes marine transmissions to a South American fishing fleet operator. The packages were sold through Marinsa Miami Corporation in Miami, Fla., for export to South America. The engines were completely overhauled, using standard blocks, crankshafts and new heads by Pan American Power at their rebuild facility in Covington.

Karl Senner, Inc. in Kenner, La., supplied 12 new WAF 541 marine transmissions with a ratio of 3.955:1, and provided on-site technical assistance. This project is a repeat order from the fleet operator, attesting to the quality of the propulsion packages.



For more information on Karl Senner  
Circle 49 on Reader Service Card

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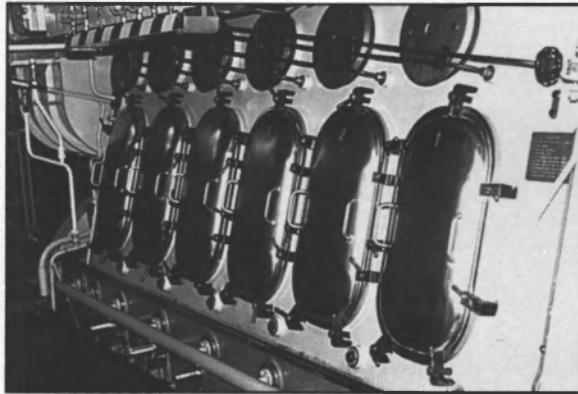
Anthony Del Gavio  
President

Circle 222 on Reader Service Card

## PROPULSION UPDATE

# 6L35MC Performance In M/S *Weserstern*

MAN B&W Diesel A/S, Alpha Diesel has manufactured small bore two-stroke crosshead engines for almost eight years. MAN B&W Diesel A/S, Alpha Diesel in Frederikshavn has delivered or has on order 68 two-stroke engines, nearly 60 percent built for European owners. Approximately half of these main engines have been delivered as part of complete propulsion packages, including CP propellers and control systems.



Pictured is the cover to the crank case, clean after the engine has been in service for 12,290 hours.

### Visit on *Weserstern*

To confirm the company's performance expectation of these engines, **L. Røvs Hansen**, former technical senior manager at MAN B&W Diesel, Alpha Diesel, carried out a follow-up on one of the 6L35MC Mk VI engines installed in six newbuildings from MTW Schiffswerft in Germany for the owner Rigel Schifffahrts GmbH, Bremen. The conditions of *Weserstern* are especially interesting to observe for MAN B&W Diesel

A/S, Alpha Diesel as *Weserstern* is the first vessel to have the newest version of the 6L35MC engine installed.

Two of these ships, *Weserstern* and *Oderstern*, are in service in North European waters — the other four vessels in U.S. waters.

The first visit paid by Mr. Hansen was on board the chemical tanker *Weserstern* — which has been in service since August 1992 — while in service from Kiel to Rotterdam.

The engine runs on heavy

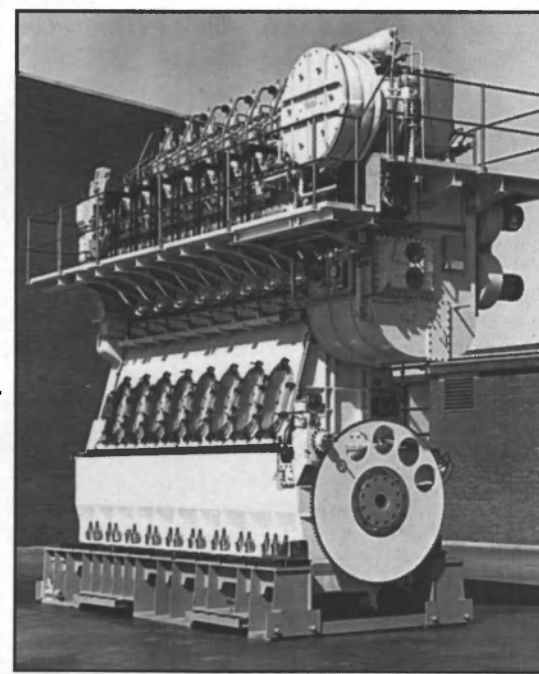
fuel oil - IF380. It is equipped with power take-off for a 600-kW shaft alternator. As the shaft alternator operates almost 70 percent of the time, the engine is normally running at a constant speed of 210 rpm. According to the logbook, the engine was in continuous operation for 12,290 hours and the shaft alternator for 8,480 hours.

From the chief engineer's recordings, the following was found:

### Consumption

Fuel oil consumption is, at 80 to 85 percent MCR and at 210 rpm, between 13,610 and 13,680 liters per 24 hours; i.e. approximately 185 g/kW-h (136 g/hp-h)

Cylinder oil: 76 l per 24 hours; i.e. approx. 1.0 g/kW-h; 0.75 g/hp-h.



S35MC in front of the test house of MAN B&W Diesel A/S, Alpha Diesel in Frederikshavn

## For three days this fall, Washington will turn from political to nautical.

Plan to be there for the 1995 International Maritime Exposition.

Wednesday, October 4: Noon to 5 pm

Thursday, October 5: 10 am to 5 pm

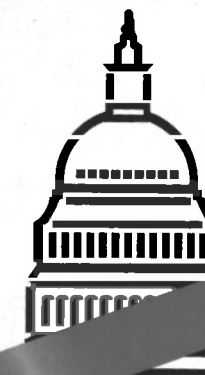
Friday, October 6: 10 am to 4 pm

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Circle 242 on Reader Service Card

## PROPULSION UPDATE

These are the values expected by MAN B&W Diesel. This confirms that in this case, the practical measurements comply with the theoretical values.

### Inspection

All cylinders and pistons were inspected through scavenge ports October 1994:  
 1. All pistons had a light layer of carbon, all rings were loose and non-rotating. No visible scratches on pistons;  
 2. Scavenge ports had only a light coating of coke;  
 3. Cylinder surface was in very good condition, still visible machining marks;  
 4. Spare piston and cylinder liner not yet been touched.

According to the manufacturer, the above observations indicate that the engine performs perfectly in view of the condition of cylinders, pistons, and that the balance between wear and cylinder oil is correct.

### Exhaust Valve Overhaul

During October and November 1994, all exhaust valves were dismantled for overhaul after 6,000 to 10,000 hours of service — one valve per day as a natural daily routine. Exhaust valve spindles and housings were carefully inspected and found to be in good condition. The overhaul data regarding exhaust valves taken from the engine and inspection protocol is listed in the table below.  
 An average thickness of material ground off for both spindles and valve seatings was approximately 0.1 mm. During the lifetime of the valve spindles it is possible to grind a valve spindle by as much as 2 mm, and consequently the valves must be ground up to seven times before scrapping or possible reconditioning. With a time interval of 7,000 hours between overhauls, valve spindle lifetime is approximately 42,000 hours. This corresponds to the lifetime expected by MAN B&W Diesel. The same applies to the valve seats.

### Clearance

For the crosshead, crankpin and main bearing, the clearances were checked in July 1994 and the measurements taken were all within the limits valid for a new engine.

### Exhaust Gas Temperature

As shown in fig 5, the temperatures in the six cylinders were between 350 degrees C and 370 degrees C, resulting in an average temperature of 361 degrees C. Low and constant exhaust gas temperatures indicate an engine in good condition.

### Turbocharger System

The blower was cleaned every day in accordance with the procedure prescribed, i.e. water washing of the compressor side. The turbine side was cleaned once a week with crushed nutshells.

### Spare Parts

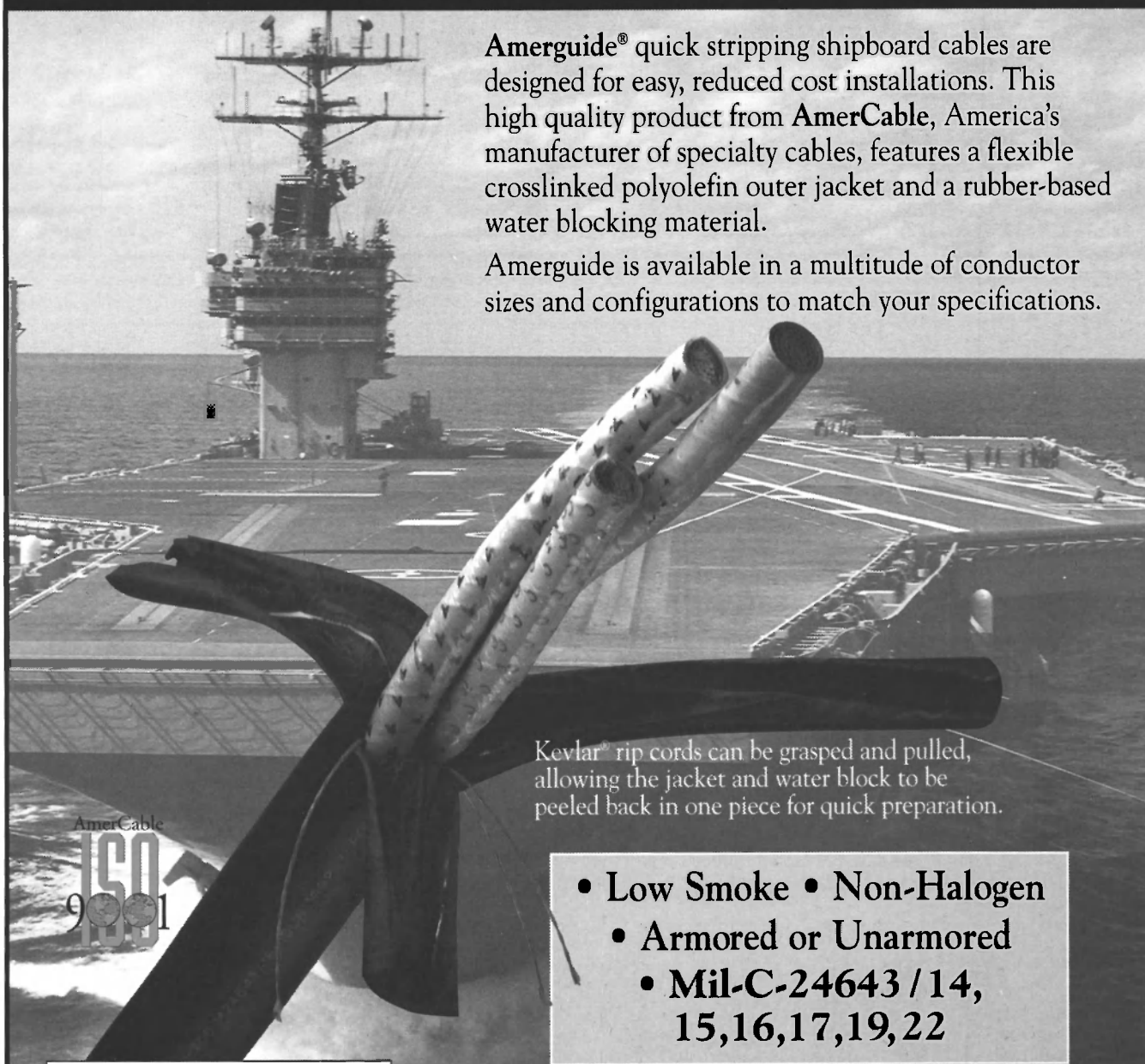
The spare part consumption for *Weserstern* is typical for the L35MC engines. However, the service time for *Weserstern* is too short at this point to give a realistic picture of the future need for spare parts. Gener-

ally it seems to be \$2-\$4/kW per year for the Rigel ships.

Based on MAN B&W Diesel A/S, Alpha Diesel's experience, the spare part consumption will gradually increase during the first four years, after which the consumption will be

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reduced by 10 to 20 percent due to the possibility of reconditioning of parts.

#### Conclusion

The above, according to MAN B&W, confirms the company's great expectations for the 6L30 engine's performance, and supports previous operating records of 489 35MC engines operating worldwide.

For more information from MAN B&W Circle 8 on Reader Service Card

Westerstom Particulars		MAN B&W 6L35MC Main Data	
Length:	361 ft. (110 m)	Bore:	350
Breadth:	58 ft. (17.7 m)	Stroke:	1,050
Draft (summer):	28 ft. (8.55 m)	Speed:	210
Tonnage:	5,480 grt	Power:	3,600
Deadweight:	9,003 t		
Service speed:	12.5 knots		

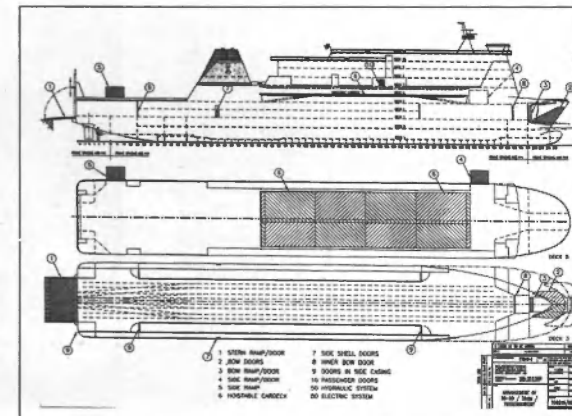
#### EXHAUST VALVE OVERHAUL

From cyl.	Date	Engine total hours	Valve in service hours	Valve out	Grinding Off (mm)	
					Seat	Spindle
1	9/94	11,546	6,277	A	.04	.15
2	10/94	11,723	6,431	B	.40	.30
3	10/94	11,723	6,431	C	.25	.35
4	10/94	11,664	7,088	D	.05	.15
5	10/94	11,921	5,921	H	.20	.45
6	11/94	12,244	6,173	I	.15	.45

MAN B&W Diesel A/S, Alpha Diesel in Frederikshavn has received, or has on order, 68 engines. The following is the breakdown by engine type.

Engine type	No.
S25MC	14
L35MC	33
S35MC	16
L42MC	5

### Stena Ferry At Van Der Giessen Gets New Kvaerner Bow Design



Design drawing of the Stena newbuild fitted with Kvaerner Ship Equipment's new bow ramp design.

Stena Line's newbuilding at Holland's Van der Giessen de Noord will feature a new design of bow ramp developed by Kvaerner Ship Equipment AB of Gothenburg, Sweden.

The combined passenger/freight/rail ferry cargo access systems feature a number of innovations, the direct result of current and pending legislation after the *Estonia* disaster. The new design of bow ramp on this vessel is part of a comprehensive array of RoRo access equipment designed by Kvaerner, which also includes the use of an inner bow door, as well as side-cabin doors.

Maritime Reporter/Engineering News



ides the Stena newbuilding, ner has designed and sup- the RoRo access equipment o new vessels being delivered h and German operators this 1: Irish Ferries' new flagship of Innisfree from Van der n de Noord, and TT Lines' 1 Hood from Finnyards — as us equipment for an Argentine erry building in Spain for de- in 1996 and two Chinese pas- r ferries building in Holland, livery in 1995.

ie new 590.5-ft. (180-m) long a ferry will enter service on the lish company's Gothenburg - erikshavn service in May of year. re bow ramp for the Stena uilding, for which a patent is ling, comprises a three-section ulcally operated ramp/door. unique design aspect of this p is that the inner and outer ions are not physically con- ed when in the stowed position. vaerner Ships Equipment has designed a complete set of RoRo ss equipment for two 15,500- passenger/vehicle ferries build- at Van der Giessen de Noord for an Marine Transport of China, ch is intended for domestic op- ions in the Yellow Sea. Deliv- of the lead ferry is set for Au- t. And, the Kvaerner unit is ) involved in the design of two ial aluminum stern ramps for a h-speed ferry under construc- 1 at Spain's Empresa Nacional an for the South American ferry rator Buquebus of Argentina.

For more information on Kvaerner Ships Equipment Circle 50 on Reader Service Card

For more information on Van der Giessen de Noord Circle 51 on Reader Service Card

### V-Line Compressor Gets LR Approval

Hamworthy Marine's V-Line range of marine starting air compressors — launched early in 1995 — has received Lloyd's type approval. The new V-Line range has enjoyed many new orders since its international launch, the manufacturer reports. One such order was for a Canadian Coast Guard vessel, and another for the MT *Kishore* for Essar Sisco Ship Management of Madras, India. A key benefit of the compressor touted by Hamworthy is the fact that the compressor requires maintenance inspection only after 2,000 hours. The V-Line compressor also requires little wiring, only three fixing points and a minimal support structure.

For more information on the V-Line Compressor Circle 25 on Reader Service Card

### Incinoleet Line Expanded

Research Products/Blankenship Co. of Dallas now offers an expanded line of Incinoleet electric toilets, serving from one person to as many as 10, from 120 V/1,250 W to 240 V/3,600 W. Marine units are U.S. Coast Guard-certified. All Incinoleet systems incinerate waste into clean, innocuous ash, without water.

For more information on Incinoleet Circle 20 on Reader Service Card

### Better Fuel Efficiency Through Better Monitoring

Instruments, Computers & Controls, Inc. introduced its patented Digital Torque Meter System for monitoring shaft horsepower and

rpm, which it says can help provide better fuel efficiency. Designed as a low-cost, easy-to-install system, it does not require factory trained personnel and is reportedly simple enough for onboard personnel to perform both the installation and calibration. The system is based on fiber optic technology and can be used as a stand-alone system and/or be interfaced to a personal computer.

For more information from Instruments, Computers & Controls Circle 21 on Reader Service Card

### Russian Fleet Purchases Ground Guard From EMS

Electronic Marine Systems Inc. (EMS) has received a fleet order from the Russian bulk fleet operating in Azov for its Ground Guard™ system. This is the first sale of Ground Guard technology to Russian interests.

The system allows a ship's captain to look ahead of the vessel a predetermined distance, at a preset depth. An alarm sounds on high bottom, charted rocks, and historical grounding sites.


For more information from EMS Circle 23 on Reader Service Card

### Goodway Introduces New Power Washers

Goodway Technologies Corp. introduced its Hot Water Hi-Pressure Washers, the HPW-1000 and HPW-1500-G. The HPW-1000 is an electrically-powered unit which delivers 1,000 psi at 2 gpm (70 bar at 7.6 lpm). The HPW-1500-G is a gasoline-powered unit which delivers 1,500 psi at 2 gpm (100 bar at 7.6 lpm). Both units feature a Beckett oil burner to heat the water, and quick disconnect nozzles designed for an easy change of spray pattern.

For more information on Goodway Circle 24 on Reader Service Card

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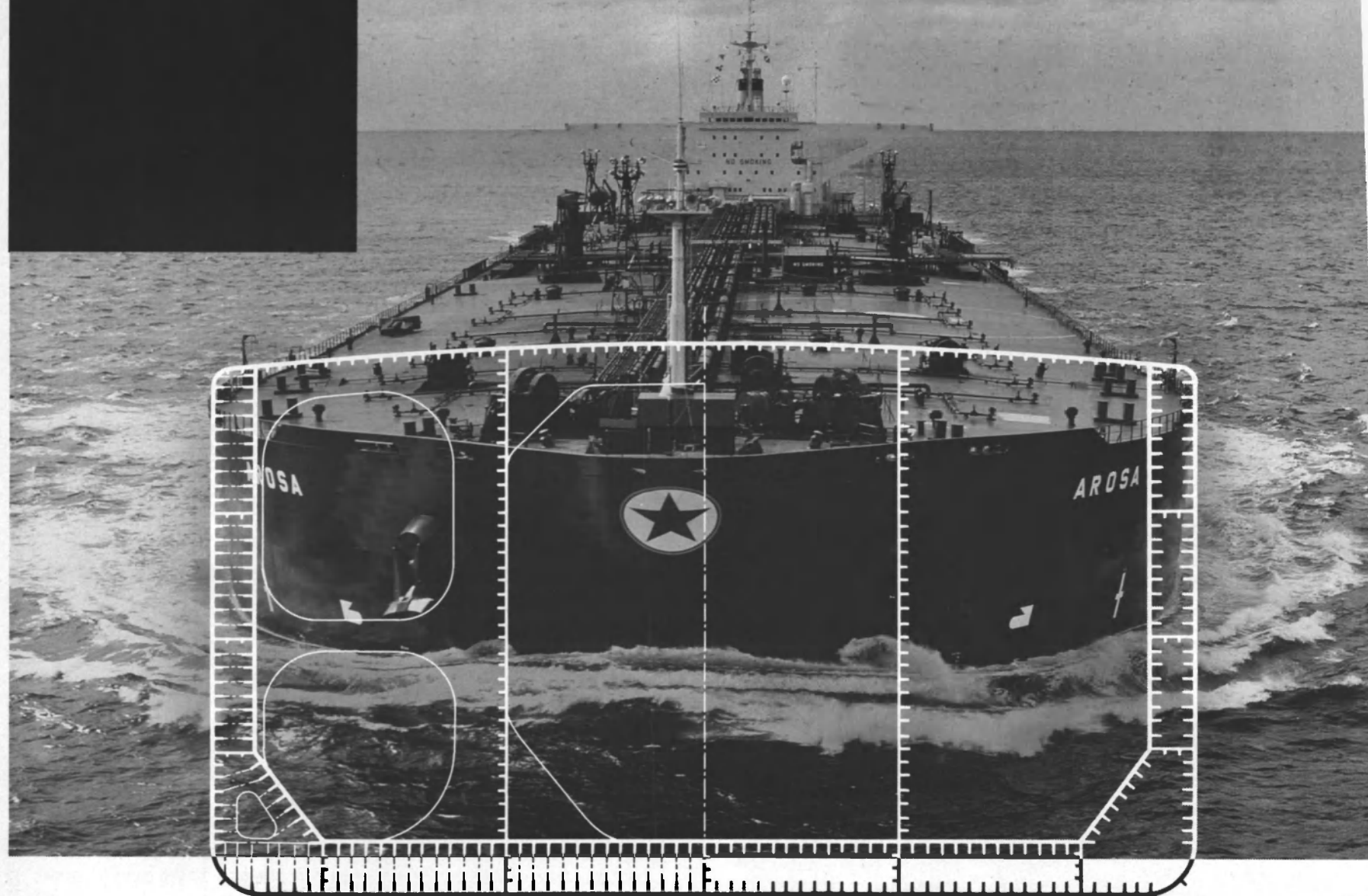
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## Halter Marine Wins \$60 M Contract For Navy Swath

Halter Marine, Inc., of the Trinity Marine Group, has been assigned a contract for approximately \$60 million by Tampa yards to complete T-AGOS 23, a 281.5-ft. (85.8-m), 5,368-long-ton displacement Small Waterplane Twin Hull (Swath) ocean surveillance ship. The U.S. Navy's Naval Sea Systems Command (VSEA) has consented to the assignment. The ships are used to augment the Navy's submarine surveillance capabilities by towing sophisticated sonar gear (SURTASS) in a broader area of coverage than previous T-AGOS vessels. Delivery in the Trinity yard, which is located in Moss Point, Miss., is planned for December 1998. The Navy and Tampa Shipyards awarded a contract for the construction of the ship in 1991, but the Florida yard was unable to complete the contract. The announcement of the new contract was made by John Dane, president of the Trinity Marine Group, who said, "This is an important milestone in Trinity's growth because it reflects the Navy's confidence in our ability to undertake and overcome complex shipbuilding challenges. The experience we will gain from this new type of vessel, coupled with our experience in the design and construction of T-AGOS

13 through 18, Navy oceanographic research ships, and the production, conversion and repair of over 15,000 vessels, enhances Trinity's stature as one of the world's most versatile shipbuilders."

T-AGOS 23, USNS *Impeccable*, will be 281.5 ft. long, with a 95.8-ft. (29.2-m) beam and a 5,369-long-ton displacement at design draft. The diesel-electric ship will have 6,000 kW of installed power provided by three diesel generator sets.

Mr. Dane said most equipment had been purchased and much steel had been cut, formed and fabricated, including about 50 percent of the lower hulls. Those components and other major block assemblies will be moved on barges, while other equipment is expected to be transported by truck or rail.

The ship will be completed at a new addition to Halter Marine, Inc., on approximately 11 acres of land adjacent to Halter's Moss Point facility. Trinity leased the property in April, and it will be integrated into Halter Marine - Moss Point. Mr. Dane said the new addition will provide additional wet dock space as well as special launching foundations, and storage and administrative space.

Mr. Dane said one of the smaller displacement T-AGOS 19 class ships recently went through a 48-hour



period in Sea State 9, and the crew was able to work without exhaustion and seasickness. As an indication of the ferocity of such seas, he said that Nathaniel Bowditch's classic, *The American Practical Navigator*, includes photos of ships enduring Sea States 1 through 7, but photos of ships in violent sea states above that are not available.

T-AGOS 23 will comply with all applicable requirements of the American Bureau of Shipping (ABS) and will be constructed under survey and classed by ABS to the highest classification of Maltese Cross A1, Circle E, Maltese Cross AMS, Maltese Cross ACU. Ice strengthening will be the Class "C" in accordance with ABS rules.

Trinity also announced that Jo-

seph McMahon has returned to Halter Marine, Inc. as T-AGOS 23 program manager, after working on T-AGOS 19 through 22, which are smaller Swath ships than the new T-AGOS 23 class. Mr. McMahon served at Halter as a production engineer and project manager from 1979 to 1984, specializing in diesel-electric ships.

For more information on Trinity  
Circle 16 on Reader Service Card

Impeccable	
Principal Characteristics	
Length o.a.	281.5 ft. (85.8 m)
Beam	95.8 ft. (29.2 m)
Draft	26 ft. (7.9 m)
Speed (Max. sustained)	12 kn
Transit range	3,000 nm

## French Yard Delivers Research/Supply Ship



Marion Dufresne, a research and supply vessel, was delivered in mid-May.

French yard Ateliers et Chantiers du Havre has delivered the vessel *Marion Dufresne* to a joint venture formed by Compagnie Generale Maritime and TAFF (Administration of French Austral and Antarctic Territories). The vessel is 396 ft. (120.8 m) long, and will serve two main functions: to act as a research vessel for experiments in ecology, biology, physics,

geology, and hydrography; and to supply the sub-Antarctic islands with containerized cargo and gas oil. *Marion Dufresne* is fitted with 650 sq. m. of laboratory space, a helicopter platform and a two-helicopter hangar, and will transport 160 scientists and missionaries in and out of the area. The vessel's first oceanographic campaign, IM-AGES (International Marine Glo-

bal Change Study), was scheduled to begin in late May in the North Atlantic and the Intertropical Atlantic.

For more information on  
Ateliers et Chantiers du Havre  
Circle 15 on Reader Service Card

Marion Dufresne Equipment	
Main generating sets	(3) Wärtsilä Vasa R32D, total power 8,250 kW
Electric propulsion	(2) Cagelac motors, 3,000 kW each
Bowthruster	KalMeWa
Rudders	(2) Becker flap type
Piloting System	Simrad DPS

Marion Dufresne Particulars	
Length	396 ft. (120.8 m)
Width	67.5 ft. (20.6 m)
Speed	15.7 knots
Container Capacity	109 TEU

## MCM Changes Name To Southern Marine

Marine Construction Management, Inc., a Fort Lauderdale, Fla., corporation, has changed its name to Southern Marine, Inc.

This announcement, made by President Jeffrey Dale Walsh, was prompted by the fact that the corporation has advised owners in all areas of vessel ownership, not just in construction and project management.

Southern Marine is presently involved in several projects including: the construction of a 300-ft. (91.4-m) fast ferry; the sale and potential refitting of a Peterson-built 66-ft. (20.1-m) patrol boat; and the pur-

chase and potential refitting of a Bertram sport fishing boat.

For more information on  
Southern Marine, Inc.  
Circle 70 on Reader Service Card

## Spedding Appointed Chair At Handling Equipment Co.

The Stamler Corporation, which is involved in the manufacturing and sales of material sizing and handling equipment, has appointed Matt Spedding as its chairman.

Mr. Spedding will guide the corporation in its introduction of battery-powered face haulage equipment and continuous haulage systems.

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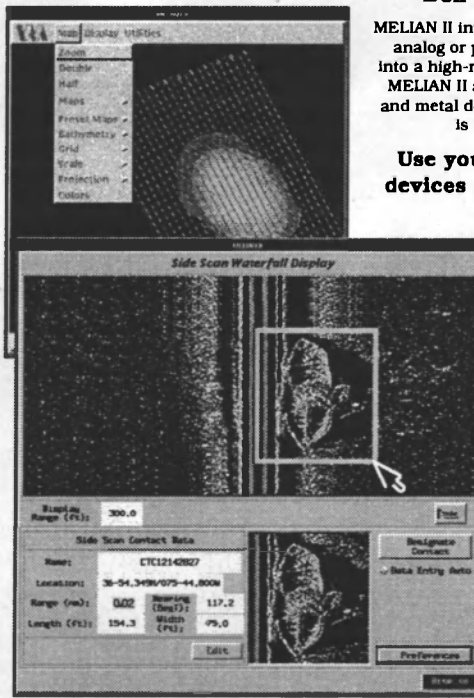
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**Analyze Contacts:** Use MELIAN II's database to catalog, categorize, and automatically cluster contacts and then build recovery plans.

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### Gibbs & Cox Supports Advanced Propulsion Pr

Gibbs & Cox, Inc. has been one of the principal subcontractors to a Lockheed Martin Ocean, River and Sensor Systems project to develop the next generation of propulsion plants. Lockheed Martin was recently awarded a contract by the Naval Sea Systems Command (NAVSEA) for Full-Scale Advanced Development (FSAD) of an Integrated Power System (IPS). The system will consist of an alternate current electrical distribution system deriving its power from the propulsion bus. A complete IPS system will be installed at the Naval Surface Warfare Center (NSWC) Philadelphia, where it will undergo testing by Cegelec Projects and General Electric Corporate Research Development, who are also principals on the Lockheed Martin team. This system will serve as the prototype for the Full-Scale Engineering Development (FSED) system that has been identified as one of the enabling technologies for the next generation of naval surface combatants (SC 21). Gibbs & Cox's role in the Lockheed Martin team will be that of ship integration lead for the total FSAD and FSED system. It will also include development of a zonal ships service system, as well as the specification of the FSAD system for NSWC.

For more information on Gibbs & Cox, Circle 44 on Reader Service Card

### Atlantic Dry Dock Merits ISO 9002 From Lloyd's

Atlantic Dry Dock Corporation, Jacksonville, Fla., was awarded ISO 9002 Quality Standard registration for ship repair and conversion by Lloyd's Register Quality Assurance (LRQA).

For more information on Circle 139 on Reader Service Card

### Simulators For Training, Certification Discussed

The International Marine Simulator Forum (IMSF) included presentations regarding the use of simulators in training; certification and licensing; ship dynamics mathematical modeling; and ship dynamics model validation. The meetings were held at RTM STAR Center's simulation, training and research facilities in Fort Lauderdale, Fla. According to Harry J. Crooks, chairman of IMSF, there is a growing demand for the use of simulators in the certification and licensing of mariners, and he noted that the U.S. Coast Guard recently approved the use of simulators in the certification of an Unlimited Master's License at the RTM STAR Center. In March, Carnival Cruise Lines signed a shiphandling training agreement with the RTM Star Center, to provide 10 weeks of shiphandling training classes.

For more information on the Circle 154 on Reader Service Card

Maritime Reporter/Engineering News

## Matson Waste Reduction Program: Profiting From MARPOL Compliance



by Bridget A. Murphy, assistant editor

In 1989, when the Center For Marine Conservation (CMC) held its annual California Coastal Cleanup, volunteers recovered a piece of plastic marine debris labeled "Matson Navigation Company," which was determined to have spent 20 years floating around the Pacific. Matson responded with concern, and in 1992, agreed to assist CMC in spearheading a pilot program for solid waste reduction. The two

organizations worked cooperatively, and in the space of one year, implemented a project that was successful in preventing an estimated 194 tons of waste from being dumped into the ocean. Waste reduction programs not only make good environmental sense, they also have economic value for shipping companies who seek to avoid U.S. Coast Guard fines, and stand to benefit financially

LEFT: Matson Navigation's Sand Island, Honolulu facility, the site from which ships' wastes are transported to regeneration plants according to the company's solid waste reduction plan.  
INSET: A solid waste program onboard the *Matsonia* prevented 194 tons of garbage from being dumped into the ocean.

through effective marketing of environmental compliance.

### Reviewing MARPOL Regulations

The International Maritime Organization (IMO) has established regulations designed to prevent further fouling of the oceans, and along with the U.S. Coast Guard (USCG), is working to close the gap between legislation and enforcement. The adoption of the IMO's MARPOL (marine pollution) regulations by the International Convention for the Prevention of Pollution From Ships in 1978 made it illegal to discharge plastic wastes anywhere at sea, and also prohibited the dumping of any solid waste in designated "special areas." These regulations were adopted by 68 individual nations, and in the U.S., the Marine Plastic Pollution Research and Control Act of 1987 went farther, imposing severe fines and prison sentences on violators of MARPOL Annex V, the annex relating specifically to solid waste disposal.

MARPOL regulations are getting stricter, with amendments scheduled to be adopted in March 1996. These amendments will extend port state control to vessel operational requirements, which means that ships can be subjected to inspections in ports of other Parties to the Convention, improving the efficiency with which marine pollution standards are enforced. As standards increase, and more "special areas" are established, solid waste reduction programs will become a standard requirement. It is therefore in the interest of commercial shippers to initiate programs now to accomplish a twofold objective: to protect the health of the ocean resource; and to utilize reduction programs as a marketing tool to promote business.

### The Pilot Program

In 1993, two staff members from CMC accompanied the 750-ft. (229.5-m) USS *Matsonia* en route

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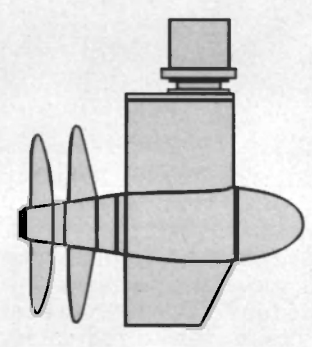
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from California to the Hawaiian Islands to fine the ship's waste disposal system and to mat a plan for "zero discharge." The representatives calculated that 47 percent waste generated was paper, 25 percent plastic, 19 percent metal, six percent glass, and percent cloth. They found that key factors establishing an effective solid waste reduction program are as follows: first, the generation of less refuse; and second, the maintenance of efficient means of storing the wastes during voyage.

One particular challenge faced by the Matson program were regulations, known as AP regulations, that prohibit the offloading in California of any food-contaminated refuse from ships that have called in Hawaii. Therefore, all solid waste generated onboard was stored for round trip voyage, and returned to a regeneration plant in Hawaii, where the non-recyclables were burned, with resultant energy sold to citizens by the plant. It should be noted that while recyclables such as glass bottles and aluminum cans are sometimes picked up in port, generating a small profit for ships, no recyclables en route to regeneration plants may be picked up and transported at cost.

Some practical recommendations for implementing reduction programs were furnished by **Linda Sheehan**, CMC's pollution program manager, based on the Matson program:

- Use of reusable cloth napkins and washable plastic utensils by the crew
- Disposal of individual cargo packaging at port before setting sail.
- Rinsing plastic to control the mess.

As stated by Ms. Sheehan, "The goal is to reduce garbage as much as possible before leaving port — go through the ship before leaving port and see where you can cut down." As of April 1995, waste reduction programs were successfully implemented on all nine of Matson's ships. The company now eliminates, recycles, or recovers the energy of 100 percent of its wastes.

**Retrofitting: Investing In The Future**

Matson's fleet comprises two classes of vessels: RoRos and containerships. The solid waste reduction program was designed with these schemes in mind, with vessels *Matsonia* and *Manukai* serving as models, respectively. In the case of *Matsonia*, a RoRo, one 40-ft. cargo container was sufficient to hold all the waste for a two-week round trip, but as described by Ms. Sheehan, one of the challenges faced in initiating reduction programs on Matson's fleet was maneuvering wastes through ships' quarters: "Ships were retrofitted to make it easier to transport the waste. This is where the cost lies."

In order to set up the program onboard *Matsonia*, very little retrofitting work had to be completed. According to Captain **Lynn Korwatch**, general manager of marine operations at Matson, "We didn't have to do much because of the big, flat deck space. We built steps that went up about a foot and a half (to the container)." The *Manukai*, however, required more effort: "On the aft-end of the ship, there is a steel structure built up, and garbage containers fit right into it. We modified the structure so that the crew can walk from the accommodation area directly into the container," said Capt. **Korwatch**.

In addition to the construction of a catwalk, the containers were also modified so that the doors would open in, as opposed to out. Garbage containers were purchased for all of the company's vessels, and five commercial dumpsters were installed inside each container, each with a designated function, separately storing plastics, cans, office paper, etc. Matson completed some of the retrofits in-house, such as minor door modifications. Other retrofitting work was contracted out to Dockside Marine, in California, and Todd Shipyards, in Washington.

Since retrofitting was completed, program

Maritime Reporter/Engineering News

tenance entails paying daily garbage fees of \$1,600 for porting debris to the regeneration facility, and monitoring the need for replacement of commercial dumpsters after approximately five years of use.

**Using A Financial Edge**  
According to Capt. Korwatch, the company invested \$110,000 on the program, including the costs of outfitting vessels, purchasing and filling containers, and setting up a waste regeneration program in Hawaii. Matson's decision to have crew involvement in the program was spurred by the location of its operations. "We felt that since we operate in an area that is very tourism-driven ... we had an obligation to protect their beaches. We have a responsibility to Hawaii because our parent corporation is located here," stated Capt. Korwatch.

"It's hard to say it's a sound investment monetarily," said Capt. Korwatch. She went on to say, however, that from a corporate standpoint, the investment makes perfect business sense. "We as a corporate organization do not make any money. However, if the crew wants to get involved, we allow them to refund the recyclables in order to buy things for the ship in order to enhance the quality of life on the ship. We have found that most people are environmentally responsible if you give them the opportunity." Satisfied employees, environmental responsibility, and the knowledge that it is way ahead of impending MARPOL restrictions are three factors that can surely work to benefit a company's bottom line.

The expenses incurred from retrofitting ships for waste storage and setting up a waste regeneration program are also a powerful investment in a shipping line's future. As explained by Ms. Sheehan, "Companies should think about future costs. A fine is going to cost more than setting up programs. I expect that more special areas (Annex V) will be added. The Coast Guard is also getting more aggressive with fines. It's to a company's own economic advantage to start thinking ahead and establishing waste reduction programs, because inevitably, it's going to be the law."

With efficient solid waste reduction programs in place, companies can use environmental compliance as a selling point to promote their services, and perhaps future innovations will include the development of profit schemes for the sale of recycled energy.

#### Using The Reduction Program Support System

The Center for Marine Conservation has extended its assistance to shipping companies that are interested in organizing waste reduction programs, and has reportedly been contacted recently by American President Lines and Sea-Land. The agency has published a report, *Achieving Zero Discharge: Ship To Shore*, that serves as a solid waste management handbook for commercial vessels. CMC also provides a

July, 1995

Commercial Shipping Information Packet, which contains materials from the National Oceanic and Atmospheric Administration (NOAA) detailing MARPOL Annex V regulations.

The USCG has estimated that merchant vessels operating in U.S. waters generate 34,000 tons of domestic trash annually and dump more than half that amount directly into the ocean. Plans to eliminate or recycle these wastes already exist; and the initiation of waste reduction

programs such as developed by CMC for Matson Navigation Co. are proof that a healthy environment can co-exist with the fiscal health of a shipping line.

For more information on developing a solid waste reduction program, contact **Linda Sheehan** at CMC's California office, tel: 415-391-6204. Other reports on this topic are available from NOAA's Marine Debris Information Office. Contact **Jim Coe**, program director, NOAA/NMFS Marine En-

tanglement Research Program, at tel: (206) 526-4009, for more information.

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Telstra Mobile Satellite & Radio Services is one of the largest providers of maritime communication services in the southern hemisphere. The Inmarsat service provided from Telstra's LES in Perth, W. Australia, offers all the existing Inmarsat services in IOR and POR — providing a combined coverage of over two-thirds of the planet. Telstra also operates a network of six Communications Stations around Australia for offshore radio

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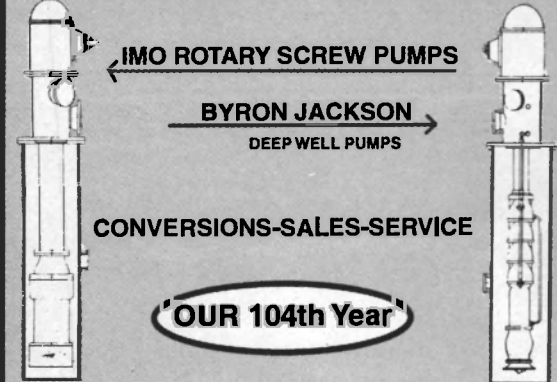
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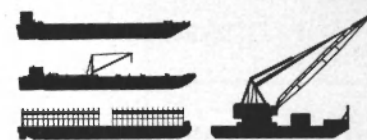
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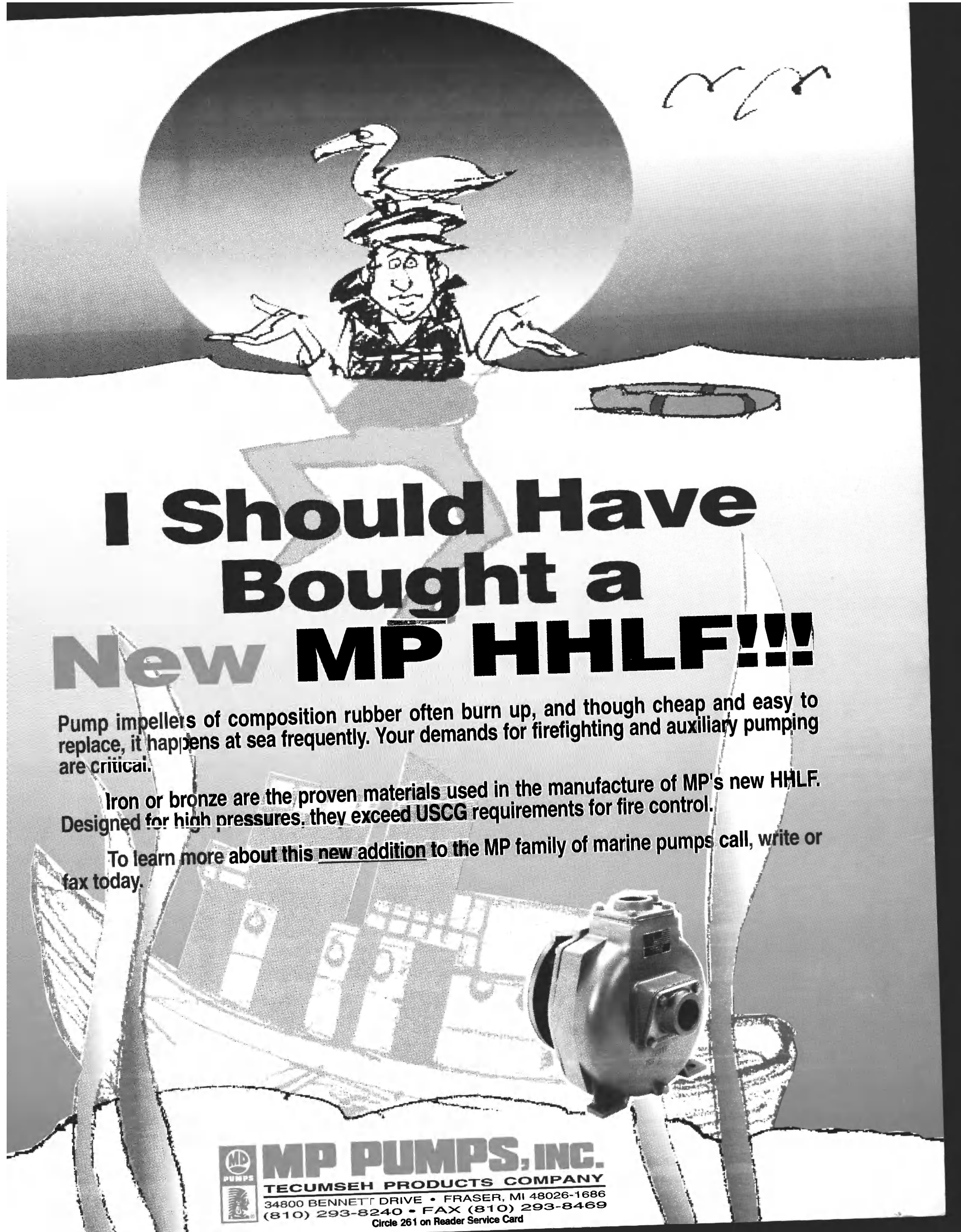
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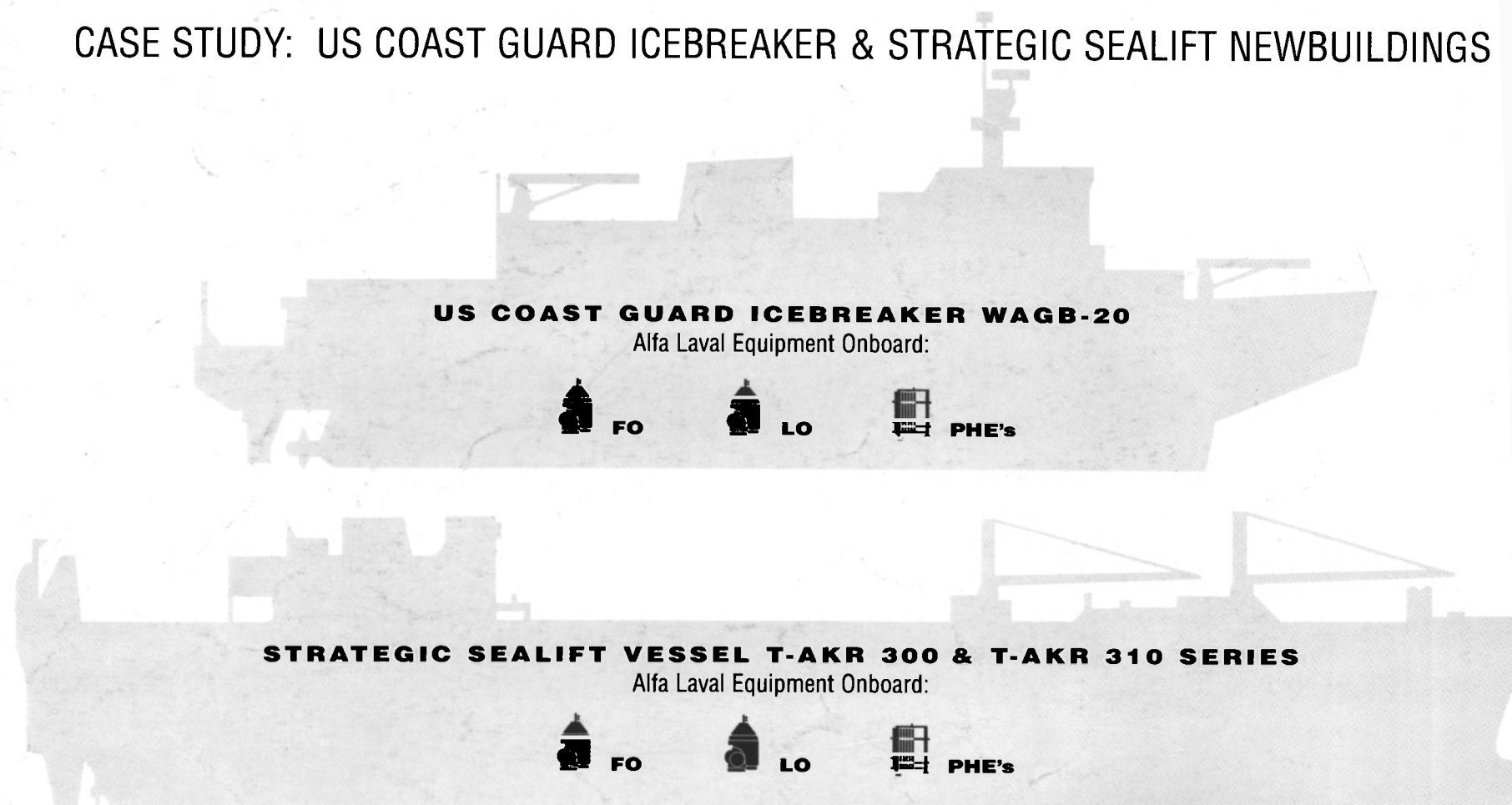
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