

**MARITIME
REPORTER
AND
ENGINEERING NEWS**

JULY 1997

Cruise Industry Annual

Merger Rocks Marketplace

Pro-active Cunard dominates luxury niche

- **Navigation & Communications:**
Equipment & service providers work hard to keep pace with demand
- **Diesel Engine Guide**
New engine models debut in Oslo
- **Italian Maritime Review**
Country tightens its grip on the cruise market
- **CAD/CAM Guide**
Selecting the right system

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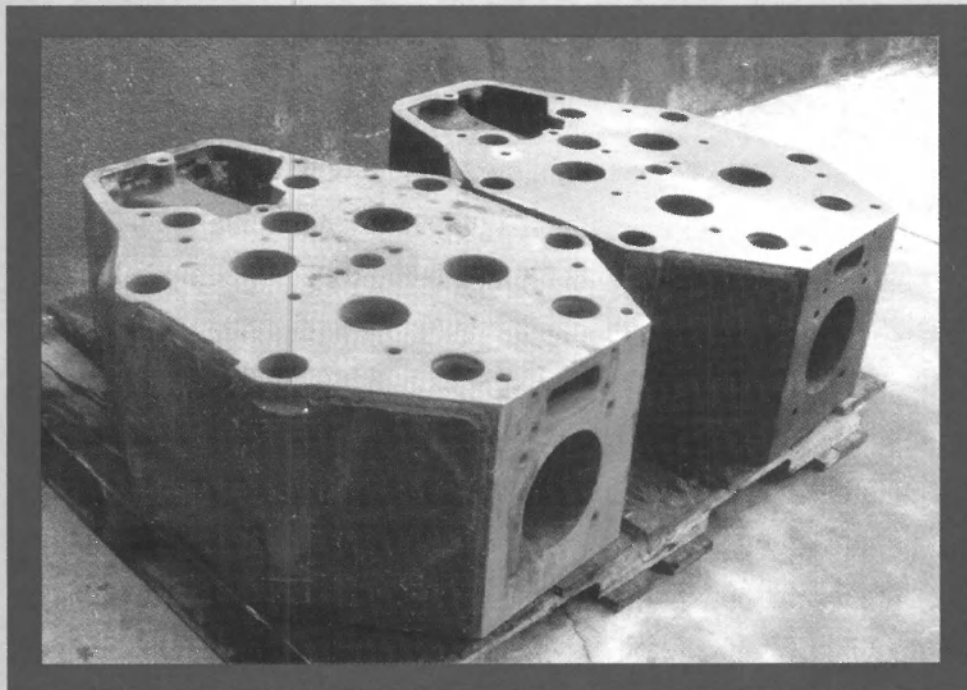
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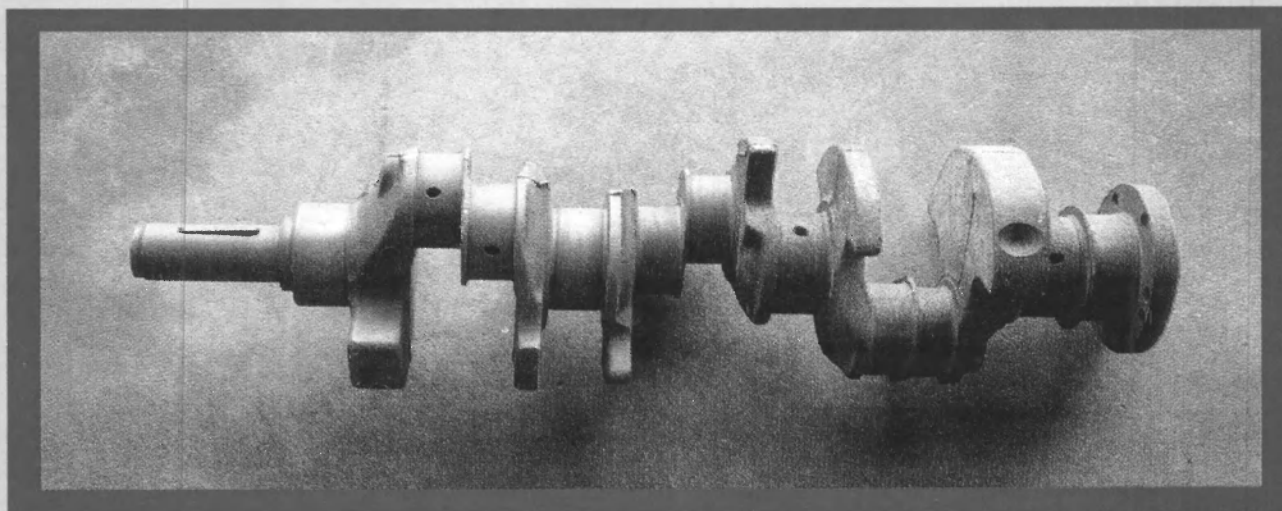
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In this edition

Pictured on the cover (and here): It will not produce the biggest class of cruise ships ever, but perhaps no other project has generated as much excitement as Disney's two-ship order with Fincantieri. Arrival of *Disney Magic* will further inflame competition in the already torrid cruise segment.

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After a flagship refit disaster, Peter Ward's eye-blink stint at the helm, a Kvaerner buy out and at-sea mishaps, Cunard has steamed its way back to front and center. CEO Antti Pankakoski spoke to Senior Editor Bridget Murphy about the company's plans for continued luxury niche dominance.
- 44 CAD/CAM: Choosing the right system**
— by Jonathan Ross, contributing writer
- 48 ITALY BATTLES BACK**
Battling fierce competition within and outside Europe, the Italian marine industry has maintained a stronghold on the lucrative cruise ship market and is positioned to capitalize on high-tech conversion and newbuild projects. — by David Tinsley, technical editor
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Shipowners are demanding and receiving improved and cheaper communications options.

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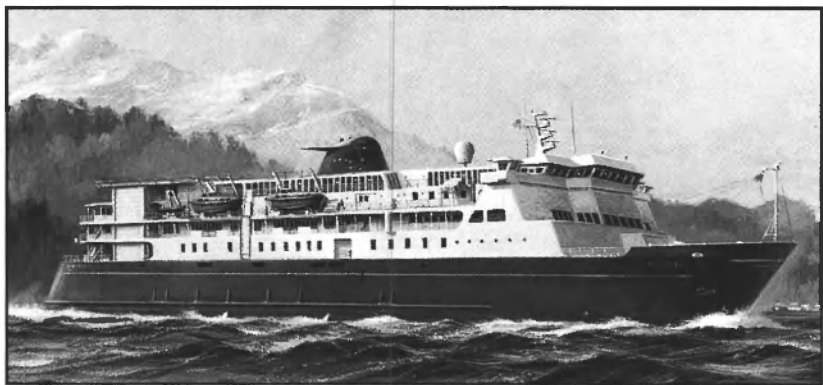
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EDITOR'S NOTE

Nor-Shipping in Oslo again proved its reputation as one of the industry's premier events. The exhibition featured a record number of companies — ship and boat yards, as well as product and service suppliers — causing it to literally spill out of the Sjølst. Center. "Show buzz" was good, as companies generally expect business to remain brisk for the remainder of the year. This attitude was perhaps aided by the recent pick-up of business in the host country's shipyards. Norwegian vessel builders continue to win a wide variety of contracts, driven by North Sea activity and led by the omnipresent Ulstein Group.

The Norwegian shipyards and ship's equipment suppliers have proven to be astute international marketers, and while the new business on its home turf is welcome, the industry has considerable interests in all regions of the world where vessels are built and repaired. This global view of doing business is necessary for survival in tomorrow's maritime market, and the trend is catching, proven by the 20 different international pavilions on hand at Nor-Shipping, including a U.S. pavilion featuring 27 companies.

MR/EN's cruise ship coverage this month revolves around Senior Editor Bridget Murphy's one-on-one with Cunard CEO Antti Pankakoski. Mr. Pankakoski provided MR/EN with a candid picture of the liner's recent reorganization, as well as the company's plans to dominate the luxury cruise niche.

The country focus this month is Italy, and Technical Editor David Tinsley provides an insightful view of the country's technical trends and business developments. Fincantieri's prominence in the cruise ship segment is a central theme — especially given its high-profile contract with Disney — but newbuild, repair and conversion business is strong and diversified. The story starts on page 48.

On the equipment side, this month's Diesel Power Review includes listings of top diesel engine suppliers, accompanied by news of recent introductions. As noted at the start of the section (page 33), the marine diesel engine market is a microcosm of world business, complete with massive consolidation and intense competition. Diesel engine makers, among a host of other challenges, are driven by shipowners to increase efficiencies, by shipbuilders to reduce cost and by legislators to improve emissions.

Finally, on the technology side, communications from ship to shore and ship to ship has become increasingly sophisticated, economical... and confusing. This month's Navigation & Communications section clarifies some recent advances, as well as delivers recent product and service announcements.



Gregory R. Trauthwein

Gregory R. Trauthwein, editorial director

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AUGUST

U.S. Ship & Boatbuilding Annual
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International Offshore Review
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OCTOBER

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N. American Shallow Draft Business
Australian Maritime Review
Fast Craft Design
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Country Focus: Spain

NOVEMBER

Nav/Comm Equipment Guide
Marine Environmental
Offshore Technology Review
Regional Focus: BENELUX

DECEMBER

Great Vessels of 1997
Software Solutions
Ship & Boatbuilding Technology
Country Focus: Japan

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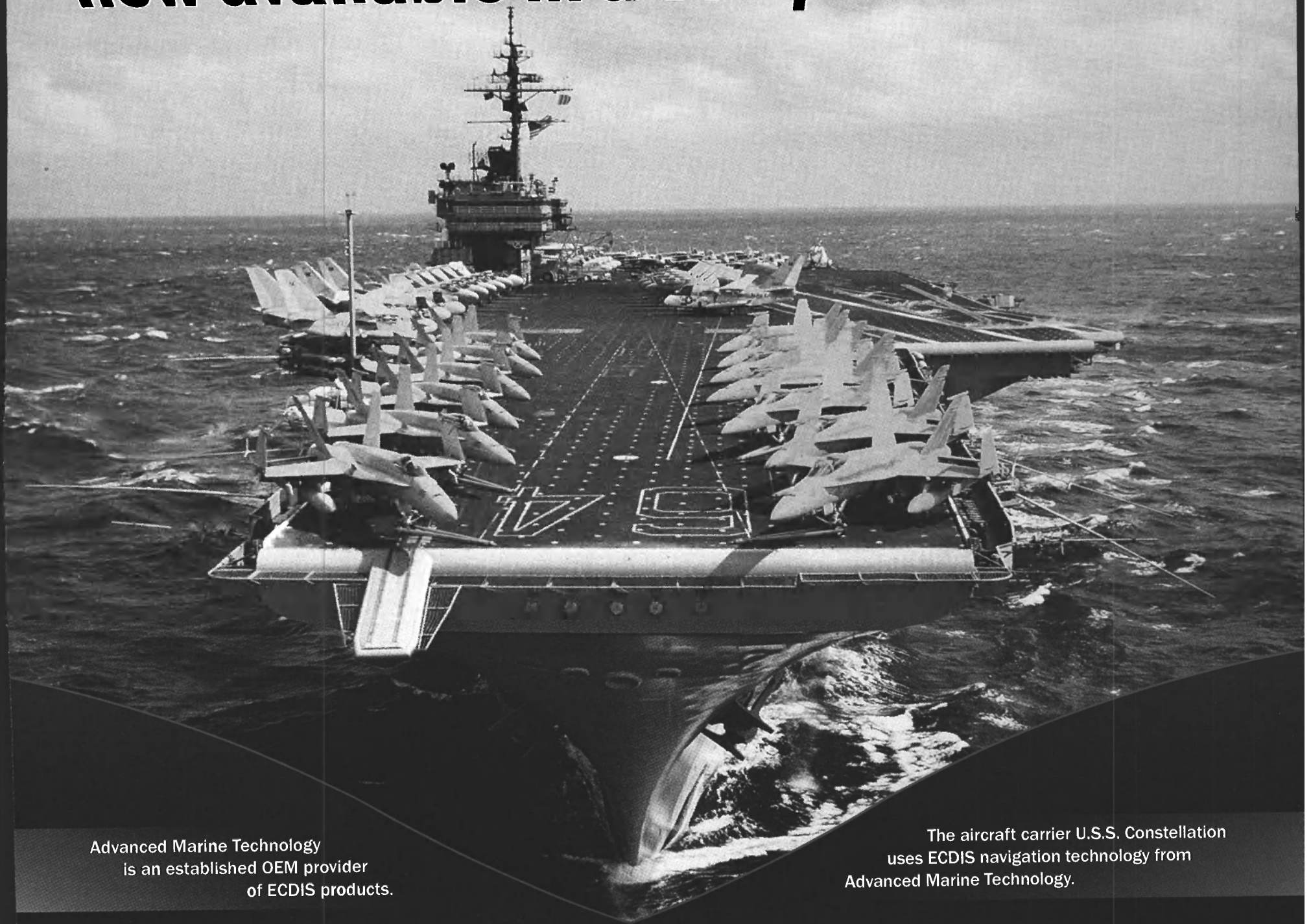
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MARINE FINANCE

EC Probes Agreement

The European Commission is probing an agreement between P&O Nedlloyd, Sea-Land Service Inc., A.P. Moeller-Maersk Line and Orient Overseas Container Line concerning container trade between North America and Europe. The accord, which was filed for EU regulatory approval in

November 1996, facilitates agreement among the companies on tariffs, capacity and inland services to shippers.

Boatracs Snags Contract

Canal Barge has signed a contract to purchase and outfit its fleet with Boatracs' satellite-based marine communications and track-

ing systems. Canal Barge expects to improve the efficiency of its operations.

AmClyde Wins Contracts

AmClyde Engineered Products, Inc. won two contracts worth \$1.2 million for offshore oilfield equipment for Petrobras America. The equipment includes a linear winch

and pedestal crane, both of which will be designed and built in the U.S. and delivered by early 1998.

NNS Gets Contract Increase

Newport News Shipbuilding (NNS) was awarded a nearly \$176 million increase to a previously awarded contract for work on USS *Nimitz*, according to the U.S. Defense Department. The contract is part of the advanced planning and material procurement.

Company To Issue COFRs

Terra Nova (Bermuda) Holdings Ltd. announced that its new underwriting agency subsidiary, Terra Nova Underwriting Agency Ltd., has executed an agreement with Scandinavian Reinsurance Co. Ltd. to establish a Bermuda-based facility that will provide financial guarantee insurance to owners and operators of vessels entering U.S. waters.

Raytheon Unit Wins Contract

Raytheon E-Systems won a contract from the U.S. Special Operations Command worth a possible \$1.12 billion over five years. The contract includes provision of logistics support to the Special Operations Command and other military, DoD and federal agencies. The support involved includes maintenance, fabrication, modification and repair of maritime systems, communications and electronics systems and weapons.

Jotun To Market Chartek

Norway's Jotun A/S will market Textron Systems' Chartek fireproofing materials. Jotun, a paint manufacturer, markets products to marine, offshore and industrial markets, supplying surface protection coatings to the North Sea FPSO market. Chartek coatings are spray-applied, epoxy fireproofing materials that expand to insulate against fire, while providing corrosion protection.

EU: Rates Restrict Competition

The European Union said recently that the International Group of P&I Clubs is in breach of EU rules because it does not allow enough competition among its members. The EU said that arrangements unduly restrict competition between the clubs by obliging all of the clubs to offer the same level of insurance cover, even if a large number of shipowners wish to obtain substantially lower levels. In addition, the EU said that the group imposes limits to price competition between the P&I



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MARINE FINANCE

Clubs.

The EU exempted some of these limits in 1985, after amendments to the original International Group Agreement were introduced; however these amendments have not sufficiently improved competition. The P&I Clubs can reply to EU objections before a final position is adopted.

Litton Reports Earnings; Seeks Stock Sale

On June 5, Litton Industries Inc. announced that sales for the third quarter ended April 30 increased nine percent over 1996 sales to \$1.1 billion. Net earnings for the third quarter rose eight percent over the comparable period of FY96 to \$42.0 million.

According to CEO **Michael R. Brown**, "Litton's financial results continue to benefit from the integration of acquisitions completed during fiscal 1996 and 1997."

Litton filed a shelf registration on June 2 with the Securities and Exchange Commission (SEC) to sell up to \$400 million in preferred stock and debt securities. Net proceeds will reportedly be used for general corporate purposes.

GE To Market Low NOx Combustion System For Gas Turbines

Through their GENXON(TM) Power Systems joint venture, Catalytica Combustion Systems, Inc. and Woodward Governor Co. announced an MOU with General Electric (GE) for the commercialization of XONON(TM) combustion systems for GE gas turbines.

The system will be adapted and applied to the requirements of GE's installed turbines, and GE will market the system and provide installation and retrofit services. The system has reportedly demonstrated oxides of nitrogen (NOx) emission to ultra-low levels, achieving NOx emission levels in the 3 ppm range during a trial on a GE 9E test stand.

EU Approves Swedish Shipping Aid Scheme

The European Commission has raised no objection to a state aid

scheme for Swedish shipping to help maintain and enhance job opportunities and training aboard Swedish-flagged vessels operating in international cargo trades to or from Sweden or in cross trades.

The scheme is an extension of a 1994 plan, and will run until the end of 2001. The total budget for

1997 is ECU 46 million.

Sumitomo Wins 10-Ship Order

Sumitomo Corp. has reportedly won a contract to build 10 double-

hulled bulk cargo ships for Hong Kong-based Top Glory Shipping Co. The order is estimated to be worth \$197.3 million. The ships include six 30,000-ton carriers and four 74,000-ton vessels. Sumitomo is expected to subcontract the work to Oshima Shipbuilding Co. of Nagasaki Prefecture, for deliv-

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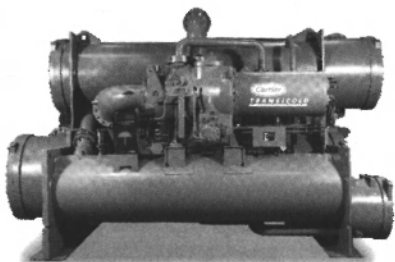
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MARINE FINANCE

ery of all 10 carriers by the end of 1999.

Crowley Sale Of Bay Asset Nears Conclusion

San Francisco-based company Fisherman's Wharf Bay Cruise was to complete the purchase of Red & White Fleet bay cruise and charter operations from Crowley Maritime Corp. last month — a transaction including the acquisition of Pier 43-1/2 at Fisherman's Wharf.

"We will continue to operate as Red & White, offering both bay cruises and land tour products with expansion into fast ferries," said **Thomas Escher**, president of the new company and grandson of Crowley's founder.

Former Red & White Fleet GM **David Pence** will serve as Marketing executive vice president. Previously linked to P&O and the Fred Olsen Group, **John Keith-Berkley** will serve as executive vice president and CFO. In addition, **William Stotler** has been named Sales vice president and Capt. **James Reed** will continue his tenure begun at Red & White Fleet as port captain for the new company.

Xylan Chosen As SmartShip Supplier

Xylan Corp. products have been chosen for the U.S. Navy's SmartShip program, which strives to reduce shipboard personnel requirements through advanced

technology.

SmartShip subsystems include integrated condition assessment systems, damage control systems, machinery control systems and integrated bridge systems. The first SmartShip installation is aboard Ticonderoga class Aegis cruiser USS *Yorktown*, and the Xylan backbone network on this ship was reportedly the first ship-wide ATM backbone installed on a U.S. Navy ship.

The network architecture for SmartShip consists of a shipwide backbone network based on ATM switching for distribution of real-time control system and navigation traffic among dedicated, switched Ethernet connections to SmartShip consoles, workstations and engineering signal data distribution nodes.

Transocean Offshore Completes Divestment In Norway

Transocean Offshore Inc. has reportedly completed its divestment of non-core activities and assets within its drilling services line of business in Norway. Net proceeds generated from the transaction were approximately \$105 million. **Reidar Lund** resigned as president and CEO of the Transocean ASA subsidiary to head Procon Offshore ASA, which holds the divested operations.

Moody's Assigns Rating To P&O

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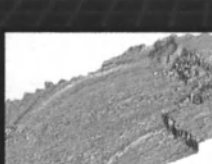


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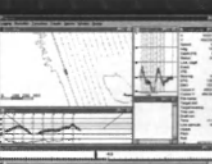
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Maritime Reporter/Engineering News

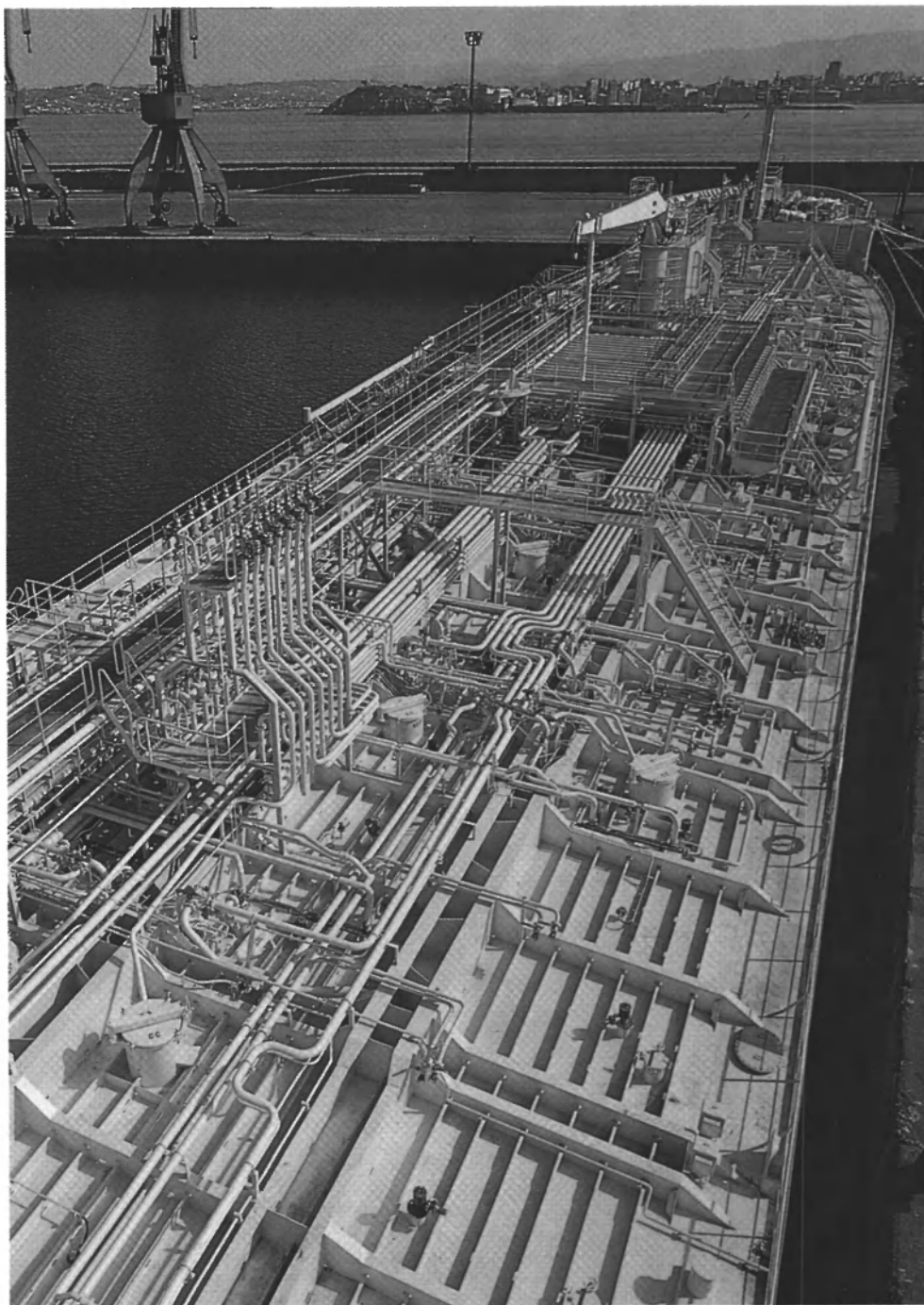
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MARINE FINANCE

Service assigned an A3 rating to the new \$300 million notes and debentures of P&O, reflecting the group's geographical diversification, the steps it is taking to reduce debt and improve operating efficiency, the current strength of its cruising operations and its growth opportunities in emerging markets. Moody's said the rating takes account of P&O's modest interest coverage and relatively high adjusted debt position as well as the company's increasing dependence on cruising, expected continuing high investment needs and uncertainty over elements of its strategic direction.

Moody's said the mergers of P&O Containers with the container shipping operations of Nedlloyd and (subject to regulatory approval) of P&O's Short Sea Cross-Channel Ferry operations with those of Stena Line AB, are well-directed towards meaningful cost-cutting and improving returns on investment. The transactions reduce P&O's on-balance sheet debt but also result in reducing the group's direct access to important sources of cash flow.

Coflexip Stena Reports Q1 Results

On May 28, Coflexip Stena

Offshore reported net income of \$0.07 per share for the first quarter of 1997. This compares with a net loss of \$0.64 per share for the first quarter of 1996.

This year's first quarter net operating revenues represent an increase of 61 percent compared with last year. However, when adjusting the first quarter 1996 to take account of the effect of exchange rate variations, the comparable line would be FRF1,028 million, with the first quarter 1997 showing an increase of 43 percent.

Moody's Downgrades TMM Ratings

Moody's Investors Service downgraded the long-term debt ratings of Transportacion Maritima Mexicana S.A. de C.V. (TMM) and its subsidiary, TMM Financial Services, Ltd. The rating actions consider the intermediate-term outlook for the company's business units as well as higher leverage and weakened debt protection measurements following a number of debt-financed acquisitions, the largest of which has been the investment in a joint venture to operate the northeast Mexican railroad.

The company recently announced a preliminary agree-

ment with APL to establish a joint service to serve the Asia-Mexico container trade. TMM expects this venture to improve efficiency and reduce costs. Similar benefits are anticipated from integrating TMM's current operations with Grancolombiana and Trasatlantica Espanola.

Fuel Handling Terminal Slated For Chilean Coast

Cordex Petroleum Inc. recently announced acceptance of a proposed letter of intent by Chilgener S.A. to fund the construction of a bunker fuel and asphalt terminal in Puerto Ventanas, Chile. Chilgener plans to finance up to 90 percent of the \$34 million project, with Cordex contributing a minimum of 10 percent.

As the sole marine fuel and asphalt facility on Chile's coast, it would become the principal fuel and asphalt handling terminal for the entire west coast of Latin America, accommodating Chile's burgeoning shipping and international trade in addition to supplying asphalt for its highways.

Vikoma Receives Orders

Vikoma International Ltd., an

Isle of Wight manufacturer of oil pollution control equipment, has announced two orders for its Kebab and Komara oil skimming systems. The contracts were signed with the U.K. Ministry of Defence and Surgutneftegaz Oil Co. in Western Siberia.

For more information on Vikoma Circle 26 on Reader Service Card

Long Island OSRO Signs Contracts

Windswept Environmental Group, Inc. announced that its West Babylon, N.Y.-based Trade-Winds subsidiary has signed an OSRO (oil spill removal organization) service contract with Star Enterprise/Texaco as a designated contractor for their Northeastern facilities through the year 2000.

Trade-Winds has also been awarded a one-year contract, with a one-year renewal option, from Long Island Lighting Co. for emergency spill response, cleanup and disposal needs for three power stations and seven additional facilities. Services will include both land and marine borne spills.

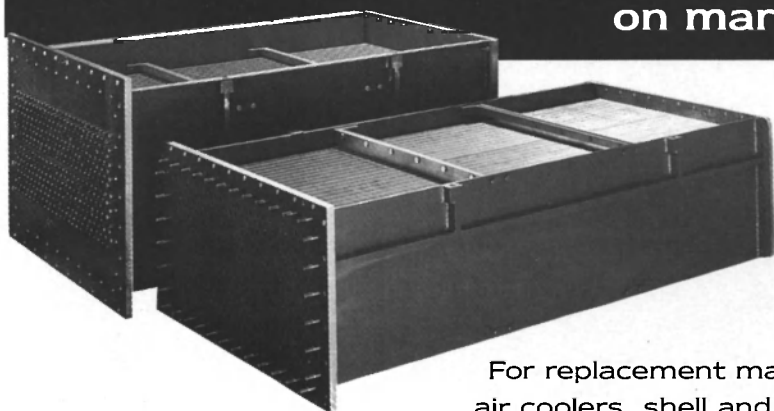
Service Marine Wins Historic Contract From Oceaneering

Service Marine Industries of Morgan City, La., will build a 248-ft. (75.5-m), 4,000-hp multi-service vessel for Oceaneering International, Inc. The vessel — dubbed *Ocean Intervention* — is the first newbuild ever ordered by Oceaneering, and it will be used in support of ROV surveying and diving.

Ocean Intervention will be classed to ABS DP-2 (double redundant) standards, certified for unrestricted ocean service and equipped with GMDSS for area A3 operation. The vessel will be configured with two 18-ft. (5.4-m) working moonpools to facilitate subsea operations in poor weather, and will be powered by a diesel-electric propulsion system. A Millennium class ROV will be built in, along with equipment to support diving services.

With a beam of 54 ft. (16.4 m), the vessel will have a dwt of 1,600 long tons at a draft of 15 ft. (4.5 m). Its capacities will include fuel oil storage tanks holding 149,000 gal-

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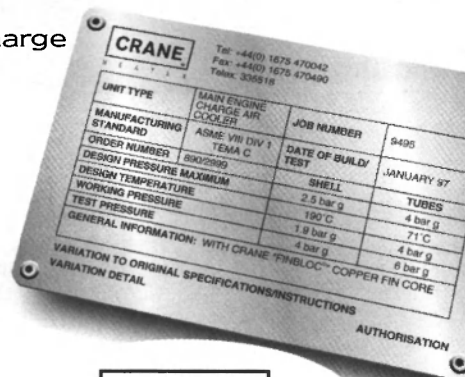
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lons, fresh water tanks holding 90,000 gallons and a ballast capacity of 300,000 gallons. The vessel is scheduled for delivery in the second quarter of next year.

For more information on Service Marine Industries
Circle 25 on Reader Service Card

NASSCO Wins Essex Contract

National Steel and Shipbuilding Co. (NASSCO) in San Diego won an \$8.5 million contract for the scheduled maintenance of USS

Essex (LHD-2). The yard will reportedly team with ship repair yards Southwest Marine, Inc.; Continental Marine of San Diego, Inc.; and Pacific Ship Repair & Fabrication, Inc. for the project.

For more information on NASSCO
Circle 27 on Reader Service Card

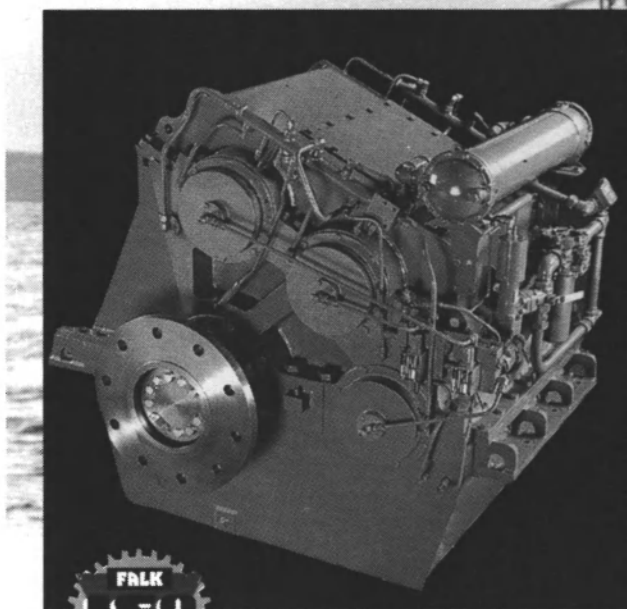
Coastal Oceanographics Sells Survey Package

Dassault Sercel NP, a French firm specializing in precision GPS products, has selected Coastal Oceanographics' Hypack hydrographic survey package as its software for turnkey hydrographic systems. The two companies have reportedly combined on several turnkey systems in the surveying and dredging sectors.

For more information on Coastal Oceanographics
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North Atlantic Marine To Perform Vessel Restoration

Portland, Maine-based company North Atlantic Marine Inc. will execute a restoration project on S.S. *Nobska* — a vessel built in 1925 at Bath Iron Works. The vessel is possibly the only and definitely one of few pure 19th and 20th century American coastal steamboats left. Fully restored, and under steam, *Nobska* will present passengers with the opportunity to experience the steamship travel of past eras. In April 1996, the ship entered drydock at the Charlestown Navy Yard in Boston to begin the restorative process, and to date, 10,000 hours of preservation and stabilization work has been performed, and \$300,000 worth of steam equipment has been acquired.

For more information
Circle 29 on Reader Service Card

STN Atlas Elektronik Supplies German Survey Vessel

STN Atlas Elektronik will provide power supply and distribution, navigation and hydrographic systems for new survey vessel *Komet*, building at the Kroger yard in Rensburg for the German Maritime & Hydrographic Agency (BSH). Equipment to be supplied includes: a NACOS 55-2 integrated navigation command unit; OSS-11Z object search sonar; Hydromap processing facilities; and Fansweep 20 shallow water multi-beam sounders.

For more information
Circle 30 on Reader Service Card

MARINE FINANCE

Incat Sells Wave Piercing Cat

Incat Australia has sold its second 282.1-ft. (86-m) wave piercing catamaran. *Sicilia Jet* (Hull 043) was purchased by Italian interests for operations on the 170-nm Naples to Palermo route.

The introduction of the vessel will reportedly reduce the crossing time between the ports from nine hours to four.

"*Sicilia Jet* is currently the only foreign-built, high-speed car ferry in commercial service in the Mediterranean," said Incat Chairman **Robert Clifford**. "I expect, as has been the case in other parts of the world, that the speed, convenience, comfort and reliability of the wave piercer will significantly increase both passenger and vehicle traffic on the route." Incat claims credit for constructing more than 40 percent of the world's fleet of high-speed car ferries.

For more information on Incat
Circle 31 on Reader Service Card

Kvaerner Kleven Wins \$50 M Contract

Kvaerner Kleven reports that it has won a \$50 million contract for two anchor-handling tug and supply (AHTS) vessels from Torm U.K.

The ship model — KMAR 404 — was designed by Kvaerner Maritime to service rigs and production vessels in medium and deep waters. Both vessels are due for delivery in the first quarter of 1991. Most of the services and components will also be supplied by Norwegian companies.

"This contract ensures full employment for all our 450 employees at Ulsteinvik and Rovde during this period," said Kvaerner Kleven Sales manager **Erik Andreassen**. Kvaerner Kleven has a reported nine off-shore vessels and one chem carrier on its books, worth a combined \$257 million.

For more information on
Kvaerner Kleven
Circle 32 on Reader Service Card

Sea Containers Forecasts Earnings; Appoints CFO

At its recent annual shareholders meeting, Sea Containers Ltd. forecasted significant improvement in 1997 earnings per share over the \$1.20 reported in 1996.

July, 1997

"Although we expect operating income from container leasing to be down somewhat from 1996 levels, we see substantial, offsetting gains in our ... passenger transportation business which should produce total net income on common shares more than double the 1996 results," said **James B.**

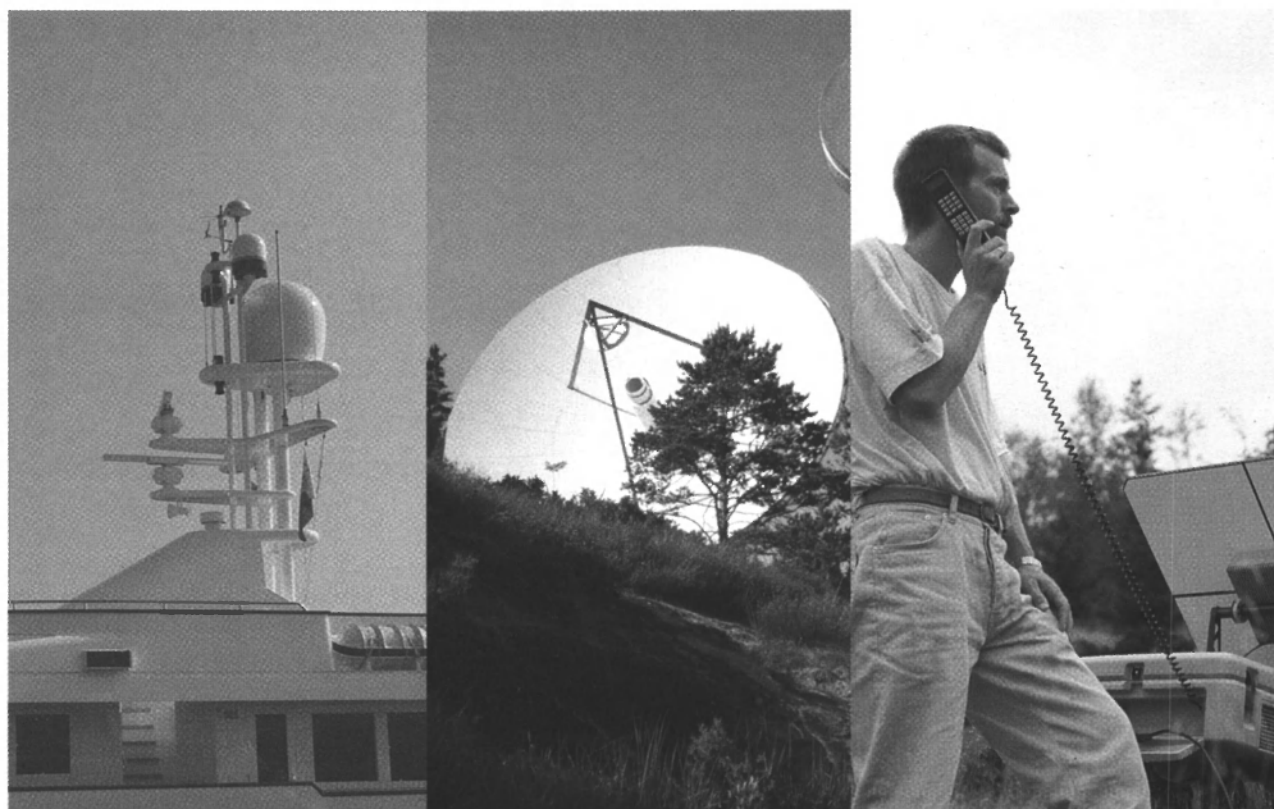
Sherwood, Sea Containers president.

"Ferries are expected to produce significant improvement in 1997 because two new SuperSeaCats will be operating the summer season, one in Scandinavia and the other in the English Channel. Our hoverspeed operation across the

English Channel is expected to have an improved year in 1997," Mr. **Sherwood** added.

In addition, Sea Containers' board of directors has appointed **Daniel J. O'Sullivan** as CFO. He was formerly senior vice president, Finance, and treasurer for the company.

Land Earth Stations and Mobile Terminals



Since Inmarsat began to offer satellite communications between ships at sea and the international telephone and telex networks more than a decade ago, Nera has been the leading manufacturer of Inmarsat technology.

Nera has designed and built nearly forty per cent of all Land Earth Stations in the Inmarsat system. About 8,000 Mobile Earth Stations of the Saturn family have been commissioned on ships and on land.

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COMPANY PROFILE

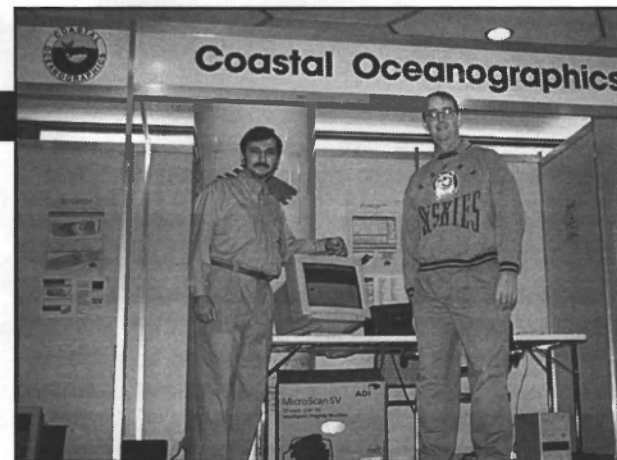
A Survey In High-Tech Product Development

Hypack software programs have been on the market since 1987, and have reportedly become a standard of excellence in the hydrographic surveying community. Hypack helped make hydro-

graphic data collection a less cumbersome and less expensive process.

Pat Sanders saw that there was a need for a low-cost, user-friendly system for collecting

hydrographic data; so he left his position as a hydrographer with the U.S. Naval Oceanographic Office to open his own hydro-



(Pictured L to R): **Mircea Neacsu** and **Pat Sanders** at the IHB Conference in Monaco, 1997.

graphic consulting service in 1979. He then began work on developing a sophisticated suite of programs dually designed for ease of operation and for providing surveyors with access to all necessary information.

He founded Coastal Oceanographics Inc. in 1981 as a hydrographic consulting service to serve companies carrying out large area survey contracts for government agencies. To help himself in the processing of manually collecting hydrographic data, he began to write programs in MicroSoft FORTRAN, and later, in PowerBasic. By the beginning of 1987 he had created an entire suite of programs, including a simple data collection program. It was then that he decided to market the product as Hypack, at a fraction of the cost of products which were currently on the market.

Hypack made its debut at a conference in Halifax, Nova Scotia. Ocean Surveys of Old Saybrook, Conn., became Hypack's first customer in 1988. By the end of that year, Coastal Oceanographics had sold three more survey software packages. The company sold 14 more packages in 1989. By 1996, the company had sold more than 185 per year, and the employee roster had grown to a staff of 15.

Mr. **Sanders** believes the ongoing success of Hypack is driven primarily by two factors: the selection of the PC platform; and the company's reputation for providing excellent customer support.

As PC technology improved rapidly and the price of the units dropped, Mr. **Sanders** said that hydrographers realized the benefits of switching. As interface cards become more widely available, they allowed the import of multiple serial devices, as well as virtually any survey equipment on the market. In 1992, the company created its first Windows-based package, which was subsequently

(Continued on next page)



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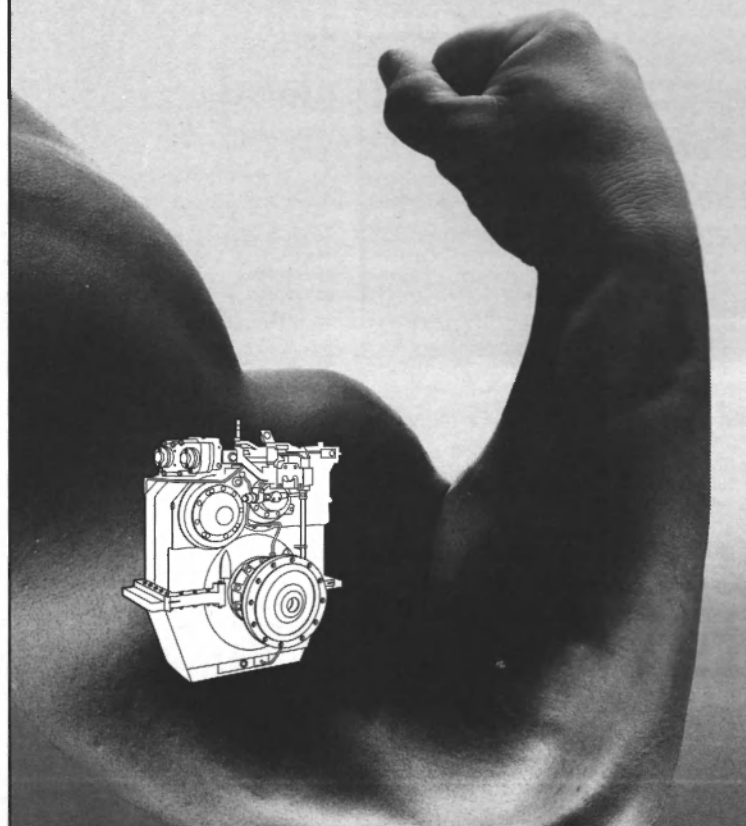
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Circle 121 on Reader Service Card

(Continued from previous page)

re-written to run under Windows95 and Windows NT.

Coastal Oceanographics has introduced new innovative products, including Dredgepack for the dredging industry and Navpack for the electronic chart industry. **Pat Sanders** was recently appointed president of the Hydrographic Society.

For more information on Coastal Oceanographics Circle 12 on Reader Service Card

Holla Wins \$87 Million In Ship Orders

South Korea's Halla Engineering and Heavy Co. has reportedly signed contracts worth \$87 million with Singapore's Tai Chong Cheang Group (TCC) to build a pair of 170,000-dwt bulk carriers worth \$87 million.

The company and the Singapore government's Trade Development Board said in a statement that an agreement was signed. The carriers will reportedly be delivered to Concord Navigation Pte Ltd., a subsidiary of the TCC Group. The first vessel is scheduled for delivery in April 1999.

Holyman To Buy Union Shipping Units

Shipping group Holyman Ltd. said it agreed in principle with Brierley Investments Ltd. to buy the Australian shipping businesses of Union Shipping Group.

Holyman said the businesses to be acquired are: Coastal Expressline, the second largest of four freight carriers across Bass Strait; Union Stevedoring Services, which serves the vessels of Coastal ExpressLine and other carriers; and Union Bulkships.

The acquisition is conditional upon regulatory and other approvals and the raising of necessary funds.

MISC Purchases Five Tankers

Malaysian International Shipping Corp. (MISC) signed a \$225 million contract to buy five 30,000-dwt chemical tankers from Hyundai Heavy Industries. To finance the construction, MISC reportedly agreed to a \$150 mil-

lion, five-year loan from a consortium of foreign banks. MISC currently has a fleet of 64 ships and has placed orders for 27 new vessels to be delivered by 2000.

Statoil Expands VLCC Fleet

Statoil AS has added super-tankers *Siam* and *Berge Stadt* to

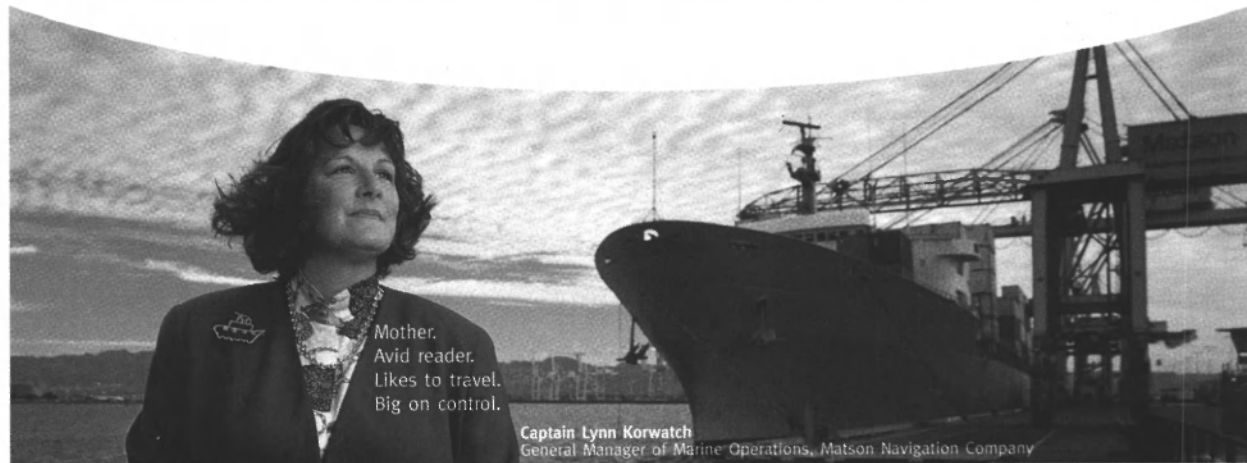
its fleet, primarily to transport crude across the Atlantic to Canada and the Gulf of Mexico. Built in 1993, the 300,000-ton *Siam* has a double hull and is owned by World Wide Shipping in Singapore. *Berge Stadt* is a double-hull tanker owned by Norway's Bergesen Group. It was built in 1994. The 307,000-dwt vessel will

begin its Statoil charter in the fall, the company's newsletter said.

Kvaerner Vyborg Wins Deal For 10 Ships

Kvaerner ASA's 75 percent-owned Kvaerner Vyborg shipyard in Russia reportedly won a 500 million crown contract to build 10

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standby vessels for Summer Wind Navigation Inc. The vessels are scheduled for delivery during 1998 and 1999.

Morocco Invites Bids For \$300 Million Port

Morocco is inviting five foreign consortiums to bid on a project to build a \$300 million port in the

northern city of Tangier.

The port which will be located about 12 miles south of Tangier, and will ease congestion in the existing port and create an infrastructure for external trade.

The site of the new port is on a deeper harbor area which will be able to accommodate ships of greater tonnage than the existing port.

IT Venture Launched

A.P. Moeller's Maersk Data unit will participate with Britain's Cable and Wireless plc in a global IT-communications for container-ships joint venture. A new jointly-owned company called Cable & Wireless Nautec is scheduled to be launched this month, if EU approval is granted.

Aging Tanker Fleet Forces NITC Into Ordering Mode

South Korea's Daewoo is first to benefit, with contract for five Suezmax oil tankers

National Iranian Tanker Company (NITC) is reportedly moving quickly to buy new oil tankers to replace its aging fleet. NITC has awarded a contract — reportedly worth \$300 million — to Daewoo Heavy Industries for five 158,000-ton Suezmax type oil tankers, and the state-owned company is expected to award a contract for five 100,000-ton Aframax tankers in the next two months.

According to an NITC source, the first Daewoo-built tanker will arrive within 27 months, with the balance of the four delivered in 45-day increments. In addition, NITC reportedly plans to purchase up to five oil product carriers and five VLCCs following the Aframax purchases.

NITC has scrapped 15 of its tankers in recent years, reducing its own fleet to 11 crude tankers and nine product tankers. The reduced fleet has caused the organization to spend money to time charter vessels from the international spot market. NITC is responsible for exporting approximately 950,000 bpd of Iran's 2.6 million bpd crude exports on a delivered or charge, insurance and freight (cif) basis. It also time charters its own VLCCs in the spot market.

Iran is the world's third largest oil exporter behind Saudi Arabia and Norway and is heavily reliant on the \$18 billion a year that oil revenue brings to the country. Daewoo supplied NITC with five 300,000-ton VLCCs in 1996.

In addition, Daewoo has also won a total of \$470 million in orders to build seven oil tankers. A company statement said a \$170 million order to build two 300,000-ton VLCCs was awarded by Euronav Luxemburg S.A. The carriers are scheduled to be delivered in the first half of 1999.



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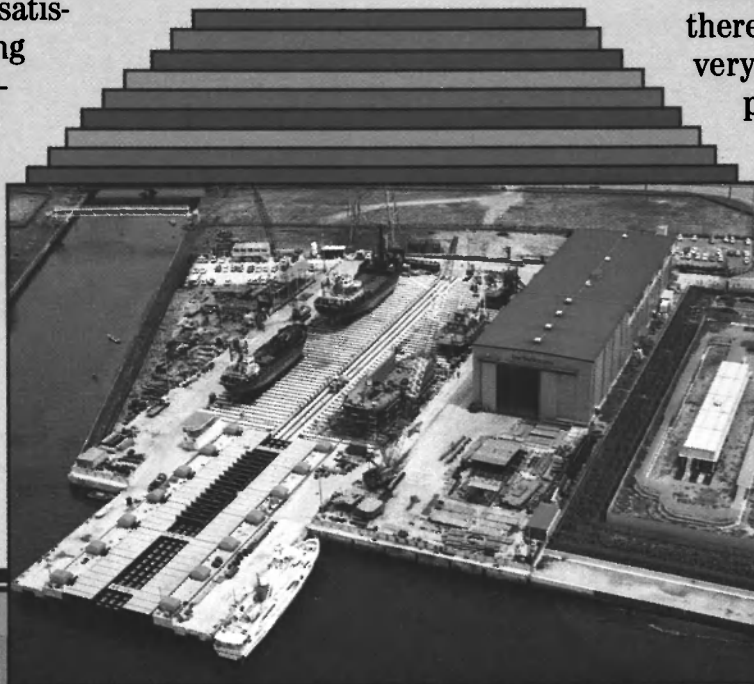
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Cruise Industry Annual

Cruising's Salty Seadog Learns New Tricks

Tradition-steeped Cunard takes aim at high-end market with new-age gusto

by Bridget Murphy, senior editor

Cruise shippers be warned: It would be a grave miscalculation to characterize Cunard's Chief Executive **Antti Pankakoski** as anything but a very cool customer. Don't let his charming, easy-going manner hoodwink you; after all, he is a veteran of the Norwegian-owned Kvaerner industrial empire and he does mean business.

Under his sturdy guidance, Cunard has steamed back to the front and center of the cruise industry in recent months, suc-

cessfully emerging from a series of at-sea mishaps, unlucky business tides and a change in ownership that temporarily waylaid the company's competitive stance in the luxury sector niche.

A focused business plan, combined with the now-unwavering support of new parent company Kvaerner ASA and rising stock prices have boosted the cruise line's image in the public eye, and concurrently, its positioning in the sector.

Revamping A Sullied Reputation

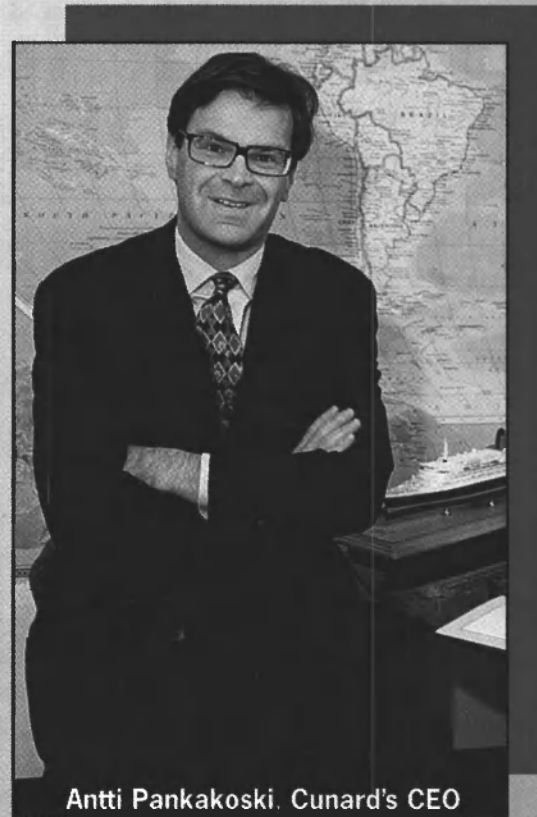
In August 1996, *The New York Times* profiled then-Cunard CEO **Peter Ward** as the force which would rescue the cruise line from a pattern of "rudderless management," in order to win the confidence of new owners who had already tried to sell off the business after acquiring previous owner Trafalgar House's assets in April of the same year.

Ward's goal was to reposition the company as a leader in what was a slowly maturing and quickly consolidating mar-

ketplace. This was to be no easy task considering the sector-wide intense battle for first-time cruisers, the 1994 *QE2* voyage which resulted in a payout in the millions to passengers after the flagship sailed prior to a refit completion, a fire aboard *Sagaffjord* which stranded passengers in the South China Sea and *Royal Viking Sun's* Red Sea reef encounter, which pre-empted a world cruise.

Fifteen months after putting a sensible and contemporary business strategy in place, the former Rolls-Royce chief jumped ship and market insiders once again held their breath as Cunard prepared for yet another torrent of bad press and sale negotiation rumors — rumors which proved to be more than just hearsay.

In November 1996, Kvaerner sacrificed its dually-appointed Shipbuilding vice president and Kvaerner Masa-Yards executive vice president to Cunard management in what appeared to be a last-ditch effort to bring the cruise line into a pattern of predictable profitability. When Finnish-born **Pankakoski** assumed leadership at this time, Kvaerner was still considering dumping the cruise line, although negotiators balked at the near \$600 million investment (\$325 million for the five-ship



Antti Pankakoski, Cunard's CEO

fleet and a \$240 to \$250 million commitment to build a ship at its Finnish yard) demanded by the owners.

Break-Out Plan Synergizes Strengths

Contrastly, seven months later, a bullish outlook on the company's business prospects prevailed at Cunard headquarters in New York City. The cruise line's all-important customer ratings had steadily

(Continued on page 26)



QEII, Cunard's flagship.

photo credit: Bridget Murphy

Proposed Celebrity Merger Attracts Rival Bid

Royal Caribbean offer for Celebrity sparks rival bid from Carnival

Princess Cruises reportedly mulling its options

On June 17, Royal Caribbean International (RCI) and Overseas Shipholding Group/Chandris Group interest Celebrity Cruise

Lines Inc. announced an agreement to merge the two companies. The value of the transaction is \$1.3 billion, and the combination of the

two cruise lines would result in a fleet of 20 ships, including five on order.

"Together, the two brands will enable us to deploy vessels and attract customers on an increasingly global basis, as well as provide opportunities to achieve

greater economies of scale," said Royal Caribbean CEO **Richard Fain**. RCI would reportedly maintain the Celebrity brand, in order to allow each entity to maximize its respective strengths.

The total transaction calls for a purchase price for the equity of approximately \$500 million and the assumption of approximately \$800 million in debt. The purchase price will be paid by a combination of \$230 million in cash and the issuance of 7.4 million shares of RCI common stock. The transaction is subject to due diligence, board approvals and the execution of definitive agreements.

The merger plot thickened six days later, when RCI rival Carnival made a \$525 million bid for Celebrity. Carnival offered the funds in cash or in cash and stock. Speculations regarding Princess Cruises' interest in acquiring Celebrity hit the news wires a few days later. At press time, Celebrity had reportedly not replied to rival bids of any kind.

On June 19, Standard & Poor's affirmed Overseas Shipholding Group's triple-'B'-minus corporate credit rating and senior unsecured debt rating. The company said that with approximately \$1.2 billion of debt, proceeds from the Celebrity sale would improve credit measures only modestly.



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Carnival Completes Joint Tender Offer For Costa Cruises

Together with Airtours plc, Carnival Corp. completed the joint tender offer for Costa Crociere S.p.A. on June 10. With the shares owned by Il Ponte, a holding company which Carnival and Airtours will purchase from the Costa family, Carnival and Airtours will own 98.2 percent of the ordinary share capital, 93.1 percent of the savings shares, 46.8 percent of the savings shares warrants and 82 percent of the total issued share capital of Costa Crociere on a fully diluted basis. The total cost of the securities acquired in the tender offer by Carnival and Airtours is approximately \$275 million.



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Newly Purchased Ship Will Join Windstar Fleet

Carnival Corp. has purchased cruise ship *Club Med I* from Services et Transports Cruise Lines for \$45 million. The vessel will join the fleet of Windstar Cruises, a Holland America company. Windstar will take delivery in March 1998, after the ship undergoes modifications at French yard

Societe Nouvelle des Ateliers et Chantiers, which built the ship in 1990.

CLIA Announces New Member

On June 24, Cruise Lines International Association (CLIA) President **Jim Godsman**

announced that Mediterranean Shipping Cruises had become the association's newest member.

The line has been in business since 1970, and operates a total of four cruise vessels in the Caribbean, Mediterranean and South Africa. The mainstay of the company's operations is container shipping and diversified maritime businesses, and the cruise line's U.S. operation is headed by **Nicola Arena**.

The cruise line's ships, *Monterey*, *Symphony*, *Rhapsody* and *Melody*, carry from 576 to 1,076 passengers.

Enchantment of the Seas Named During Southampton Ceremony

Royal Caribbean International (RCI) appointed **Colleen Fain** godmother of *Enchantment of the Seas*, now under construction in Finland. Ms. **Fain**, spouse of RCI CEO **Richard Fain**, was scheduled to name the ship during ceremonies in Southampton, England, on July 12.

Enchantment of the Seas will be the 12th ship in the Royal Caribbean fleet and is the fifth of six Vision class vessels being built. Royal Caribbean currently operates 11 modern ships with a total capacity of 19,770 berths.

The company will introduce its last Vision class vessel in May 1998, and will unveil a new generation of cruise ships in 1999 and 2000: two 130,000-ton, Eagle class vessels, the largest passenger ships ever built.

Holland America Supports Alaskan Programs

On June 11, Holland America Line announced \$200,000 in corporate contributions for Alaska tourism-related educational programs. The announcement of the donations was made by company President and COO **Peter T. McHugh** during receptions held aboard *Veendam* in Alaska.

Donations made to the

University of Alaska included funds for its museum, SeaLife Center, Anchorage food service program and for training native persons for the Alaska Native Heritage Center, which will open in 1999.

Fincantieri Launches New Princess Flagship

On May 22, *Grand Princess* was launched at Fincantieri's Monfalcone shipyard in northeast Italy. **Alison Ratcliffe**, spouse of P&O Group's Princess Cruises Ltd. Chairman **Peter Ratcliffe**, broke a bottle of champagne over the ship's bow.

The vessel was to be floated to an outfitting pier for interior completion before handover in spring 1998 when it will become the flagship of the Princess Cruises fleet. The \$400 million, 935 ft. (285 m) long, 109,000-gt ship will have a maximum capacity of 3,300 passengers and 1,100 crew. Its maiden voyage, from Southampton to Istanbul, is scheduled for May 1998.

The vessel is the fifth Fincantieri has built for P&O at Monfalcone after the 70,000-ton sisterships *Crown Princess* and *Regal Princess* and 77,000-tonners *Sun Princess* and *Dawn Princess*. The yard will also be building two additional 77,000-ton ships — *Sea Princess* and *Ocean Princess* — for P&O Princess Cruises.

This is reportedly the first vessel to be built at Monfalcone using a new mobile, completely robotized workshop designed and built by Fincantieri under the European Eureka project.

Electrical Problems Slow Cruise Liner Delivery

Royal Caribbean International's newest ship, *Rhapsody of the Seas*, returned to Chantiers de l'Atlantique shipyard in St. Nazaire, France, on April 22 following damage to the starboard propulsion motor. The ship was reportedly 25 miles out of

Fincantieri Joins Bow And Stern Of Disney Magic

The bow section of *Disney Magic*, pictured on this month's Table of Contents page, was launched and tugged 100 miles up the East Coast of Italy in mid-April to be joined with its stern outside of Venice. The sections of the ship were built simultaneously at Fincantieri yards in Ancona and Marghera in eight months' time.

"The construction of the hull in two different yards is one example of the many innovations which we are introducing to the cruise industry through the launch of the *Disney Magic*," said Disney Cruise Line (DCL) President **Art Rodney**.

This process has previously been used in building tankers and aircraft carriers, but this is reportedly the first time it has been applied to cruise ship construction.

The bow was launched from its building berth in the Ancona Shipyard on April 12, and accompanied by three oceangoing barges, embarked on a 42-hour transport to Marghera. Through the use of underwater cameras and mechanical guides, the bow was methodically guided in and the two sections were welded together to form the entire hull of the ship. *Disney Magic*, featured as this month's Cover Shot, is scheduled to enter service next March.

On June 6, DCL aired its first television advertising campaign in the U.S. The Leo Burnett-created commercial, "Clouds," is an extension of a print campaign that has been running since last October. "Our new advertising campaign was designed to establish Disney Cruise Line as the first-ever land and sea vacation created by the dream-makers at Disney," said DCL Marketing Vice President **Howard Pickett**.

Cruise Industry Annual

St. Nazaire when the electric motor overheated.

No passengers were aboard, and the ship returned to St. Nazaire under its own power. A team of Royal Caribbean technicians and representatives of electrical equipment supplier Cegelec assembled at Chantiers de l'Atlantique to review the damage and estimate repair time.

On May 23, *Rhapsody* made cruise history when it traversed the Panama Canal. At 915 x 105.6-ft. (278 x 32.1-m), the 78,491-ton vessel is the largest cruise ship ever to transit the canal. At this time the month-old ship was midway through its maiden voyage which began in Miami and concluded in Los Angeles on June 1, at which time the vessel was officially named.

Rhapsody was scheduled to begin its regular season June 14, with seven-night sailings out of Vancouver, visiting Juneau, Skagway, Sitka, Ketchikan and Misty Fiords in the Inside Passage.

Joining sistership *Legend of the Seas*, which has sailed Alaskan waters since 1995, *Rhapsody* will be the largest cruise ship operating in Alaska.

The ship cruises at a speed of 22 knots, and is equipped with two bowthrusters, one stern thruster and two stabilizers.

New Ferry Stability Rules Enter Force

New ferry and passenger ship safety regulations from the International Maritime Organization (IMO), and directly resulting from the loss of the *Estonia* in 1994, recently became effective.

Amendments to the International Convention for the Safety of Life at Sea (SOLAS), 1974, concentrate particularly on the stability of RoRo ferries. But the stability requirements for existing vessels are being phased in so ships with 85 percent of a stability value set by the IMO will not be required to comply fully until October 1, 1998.

Ships already reaching 97.5 percent of the A/Amx mathematical stability formula will be required to comply fully by October 1, 2005. A new regulation has also been introduced for RoRo passenger ships carrying more than 400 pas-

sengers, intended to ensure vessels can survive without capsizing if two compartments are flooded after damage.

An artist's rendering of *Grand Princess*. The ship was launched in late May at Fincantieri. For more information, see story on previous page.



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Cruising's Salty Seadog Learns New Tricks

(Continued from page 21)

climbed, Kvaerner's sale intentions seemed to have been shelved and **Antti Pankakoski** sat down with *MR/EN* to speculate on events in his company's recent past and to divulge his views on the apparent turnaround. First order of business: details on the Cunard reorganization strategy.

"Definitely our intention is to give good value for the dollar. The product is a luxury product, but it should always give good value for the dollar spent," said **Pankakoski**, explaining that an important element of the company's strategy was decided a few years ago when Cunard determined it would "concentrate on the luxury end."

At this time the company also sold off certain ships, launched aggressive sales and marketing campaigns and improved service onboard, reinforcing the corporate mission of growth through refurbishment and strategic marketing agreements.

"The process that he (**Ward**) and the team started — I do share their views and strategies. He and the team here (New York) started a lot of good initiatives. Basically, we're following the same lines, with a few differences," said **Pankakoski**.

The main tenets of the plan call for maintenance of a five-ship fleet, superior management shoreside, the best passenger service seaside and a peaked emphasis on all that exudes luxury. The seasoned observer would also add Cunard's engagement of a new public relations firm, the company's increased internet presence and the cruise line's absolute commitment to the highest vessel maintenance standards to the mix.

"The ships are up to the highest modern standards. They have been well maintained. We have a refit every two years so as to make sure we keep up with the state-of-the-art," said the Cunard executive.

Pankakoski also spoke about Cunard's information technology (IT) efforts, specifically in the areas of revenue management and shoreside reservations, stressing: "We're really trying to bring this company up to date. We're working on a number of initiatives at the same time. In order to maintain and improve our position, it goes without saying that you have to."

"I think we've seen some results based on higher '97 profits," said **Pankakoski**, adding: "The company is moving and the company is moving now in the right direction. Management-wise, we've been able to stabilize the company." He also said that keeping Cunard's senior management concentrated in New York as opposed to a split with London seems to have effected a better exchange of information, which is "much, much better from a team point of view."

To Sell Or Not To Sell

In mid-May 1997, Kvaerner shares surged seven percent based on the company's higher than predicted earnings for Q1. Reported profits of \$62 million included funds earned from the divestment of shares in Norwegian shipping group Bergensen and Britain's Amec plc, interests which were deemed sellable as non-core assets. Market watchers wondered if these transactions spoke volumes concerning Cunard's fate. **Pankakoski** was willing to clear the air somewhat in this regard.

"This operation is still being



Photo credit: Bridget Murphy



Photo credit: Eamon Callahan

regarded as a so-called non-core asset. At the same time, we have the full support of Kvaerner at all times ... They have approved every measure we have proposed," **Pankakoski** confided to *MR/EN*, squelching, if temporarily, gossip about parent company ownership misgivings.

Indeed, Kvaerner has been generous in approving Cunard's proposed measures, which according to the Cunard chief, account for a \$40 million tab which will go towards funding work on the line's five ships for just one year (December 1996 to December 1997).

Pankakoski also has his own measures in mind for increasing market shares and ensuring Cunard's dominance at the high-end niche of the cruise sector for years to come. He told *MR/EN* that his goal for 1997 is to reach full capacity utilization, and this goal doesn't seem far off as the year's bookings are solid. "In '97, the ships will be relatively full throughout the year," said the CEO.

After the goal of sailing full ships is realized, **Pankakoski** said that he will not overlook the possibilities of building new ships, exploring mergers or acquiring existing fleets. On the subject of newbuilding, this shipbuilder by profession confided: "I think that would be the likely way to go. I would hate to exclude the notion of doing something with another line or acquiring existing ships. Building a new ship is always a very attractive option."

Poised For Success In Global Market

The failure of several smaller cruise lines in

Cruise Industry Annual

the last few years and the continuing trend towards industry consolidation has emphasized the increasing globalization of the cruise market. North American cruise companies are springing to set up European and Asian markets in order to compete for passengers, namely the ever-valuable first-time cruiser, worldwide.

As a pioneer of transatlantic service, a cruise line with a rich heritage of transporting immigrants to new lands of opportunity and soldiers and supplies to battle in times of conflict, Cunard's business is inherently global and therefore poised for success in the current market conditions.

"What we have seen other cruise lines doing this summer is approaching the markets and the areas that we have been sailing for years," said **Pankakoski**, specifically referring to Southeast Asia and Europe, adding: "Forty-five percent of our total revenues come from abroad."

"Globalization has been an essential part of the operations of this company. We've been a genuine global company for many years. We wish them (other cruise lines) welcome to the those markets," stated **Pankakoski**. His logic is that the internationalization of the industry will attract more passengers to Cunard's ships in much the same way as the entrance of Disney ships will attract more repeat passengers to all of the industry's ships.

Return To Rumorville

While speculations regarding the sale of Cunard are not currently inflamed — but also not likely to fade away until the cruise line significantly ups profits or commands another sort of big-time deal such as a new ship contract or a merger agreement — the cruise industry rumor mill remains full.

A day after the Royal Caribbean International/Celebrity Cruises proposed merger was announced and before Carnival stepped in with a cash offer and rumblings of Princess' interest began, **Pankakoski** discussed how the merger of the cruise players would benefit the market: "I think it's a good move for the companies. It will allow them to synergize their strengths and cut down on cost."

Discussing past incidences when

Kvaerner placed Cunard on the sales block, he wouldn't say if any of these companies were involved in negotiations, adding mysteriously, "Let's just say a number of companies have been in touch in

the past."

With a merger-friendly shipbuilding executive at its helm, and former Dolphin Cruise Line and Majesty Cruise Line president Capt. **Paris G. Katsoufis** joining

the company as president and chief operating officer, the future remains bright for Cunard, whose ships are the salty, yet unmistakably favored seadogs of the cruise industry's infant fleet.



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INDIA: Big Plans To Acquire Ships, Aid Shipbuilders

\$1.3 billion worth of ships to be bought; 30% subsidy Approved

India Shipping Corp. Plans To Spend \$1.3 Billion To Buy 44 Ships

In the next five years, Shipping Corp. of India plans to buy 44 vessels totaling 1.95 million dwt, the country's Surface Ministry reported.

The ministry estimates the total cost to be \$1.3 billion. The increased capacity is reportedly needed to meet the country's increasing demand for crude oil imports, and also to deal with a sharp rise in waterways trade.

The company currently has a fleet of 29 crude oil tankers.

Shipping Corp. Tanker Deal Given Greenlight

The Indian government reportedly approved a proposal by state-owned Shipping Corp. of India to buy two crude oil tankers from Halla Engineering and Heavy Industries for \$42.1 million each.

The Aframax tankers will be designed with a capacity of 110,000 dwt each.

Aid Package Announced For Shipbuilders

India also announced an aid package for its shipbuilding industry — a package which includes a hefty five-year, 30-percent subsidy

The measure is intended to help bring the country's shipbuilding prices down to competitive world levels.

The Surface Transport Ministry said in a statement that the plan stipulates that the government would pay a 30 percent

subsidy to the yard over and above the international price of the vessel.

The ministry is reportedly encouraged by a capital restructuring plan at Cochin Shipyards Ltd., and had approved a similar package for Hindustan Shipyard Ltd. It announced that the government was writing off 4.7 billion rupees (\$130 million) of government loans and interest, and converting 1.2 billion rupees of debt into equity as part of the package.

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DCN Wins Norwegian Navy Contract

Boat modernization pact includes installation of next-generation combat management system

DCN International of France has won a contract to modernize 14 fast patrol boats for the Norwegian Navy. The contract calls for the supply of the French SENIT combat management system for the Hauk class patrol vessels.

The package will include associated sensors, communications and navigation equipment, as well as an upgrade of the boats. The first modernized vessel is scheduled for delivery in the third quarter of 2000. After that, deliveries are scheduled for every three to four months.

DCN International tendered in cooperation with Norway's Kongsberg.

The Norwegian authorities have also reportedly taken an option for supply of between six and eight DCN combat systems for a new sea-skimming patrol boat using hydrofoil-type technology.

Kvaerner is currently building the Skjold prototype, which is a new vessel class designed to achieve speeds of 50 knots with its hull lifting out of the water.

DCN would deliver a system based on SENIT, an automated system with software which will link up sensors such as radar, infra red and optronics, communications and navigation systems, to allow the boats to intercept threats along Norway's fjords.

PGS Selects Australian Company For 3-D Survey

Petroleum Geo-Services ASA (PGS) was selected by Australia's Woodside Offshore Petroleum to

perform a 3-D seismic survey offshore Western Australia. PGS plans to use *Ramform Challenger* to carry out the survey. Work is scheduled to begin in the last quarter of 1997.

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A Deep Submergence Vehicle Support Ship, a utility vessel, and an offshore drilling rig have solved their diesel bug problems by fitting special magnetic microbial decontamination units in their fuel systems. These unique devices, De-Bug™ Fuel Decontamination Units, eliminate diesel microbes and associated problems in a clean, safe, environmentally friendly manner without toxic biocides. Developed 14 years ago in New Zealand by De-Bug Worldwide Limited, a leader in magnetic decontamination, the units are marketed in the U.S. exclusively by Environmental Solutions International (ESI), Inc., of

Reston, Va.

The marine industry has long suffered with problems caused by microorganisms that live and grow in fuel, fuel tanks, cargo, ballast tanks, and lube oil systems. Some water is present in all fuel and the bugs flourish at the oil/water interface, feeding on the oil. Engine room temperatures (60-95° F) exacerbate the situation by providing ideal breeding conditions. Left unchecked, the bugs quickly multiply and clog filters, fuel lines, and corrode injectors, leading to equipment breakdown and failure. The patented De-Bug Unit passes the diesel fuel through vertically stacked ceramic permanent mag-

nets - TRI-MAG™ or MULTI-MAG™ Bug Killer Paks. Within the designed path, the fuel and microbes experience many flux field changes and intensity capable of destroying nearly 100 percent (97.6 percent) of the microorganisms in a single pass. An example is the DSESS *Kellie Chouest*, a 310-ft. Deep Submergence Rescue Vehicle Support Ship equipped with twin EMD 645 diesel engines. Leased to the U.S. Navy for research, rescue and retrieval, the vessel cannot risk engine power loss or shutdown. However, severe algae contamination of the fuel required replacement of the fuel filters on all engines every few



hours. Installing De-Bug Units in the fuel supply lines to the main, generator, and auxiliary diesel engines solved the problem, extended the filter replacement interval to the normal maintenance schedule, and restored the engines to their required standard of dependability. Captain **Eugene Thomassie** said, "We are well satisfied with the performance of the De-Bug units."

A 100-ft. utility vessel, the M/V *Skippin Sue*, owned by T.E. Marine, Larose, La., reportedly experienced similar problems. In May, filters on the DDI 12V-92 main engines were being changed two to three times per week due to microbial clogging.

After De-Bug installation, the initial filter change interval reportedly increased to two weeks, and one month later the filters are still clean. **Tillman Danos**, a T.E. Marine principal says, "...it's great ... really doing the job. (We) will put them on all the other boats..."

A major oil company's offshore drilling platform in the Gulf of Mexico experienced severe problems with diesel engine performance and dependability caused by contaminated fuel stored onboard. Fuel filters had to be serviced every one to two hours. Recirculating the fuel through a large De-Bug Unit Model L-4000, helped eliminate the problem by continuously treating the stored fuel before supply to onboard engines.

De-Bug Units are available in a complete range of sizes for all applications. The exclusive U.S. agents, ESI, Inc. are staffed by marine engineers with 70 years experience in fuels and lubricants who provide practical advice and optimal solutions. ESI also offers total fuel management systems and an international used-oil analysis service.

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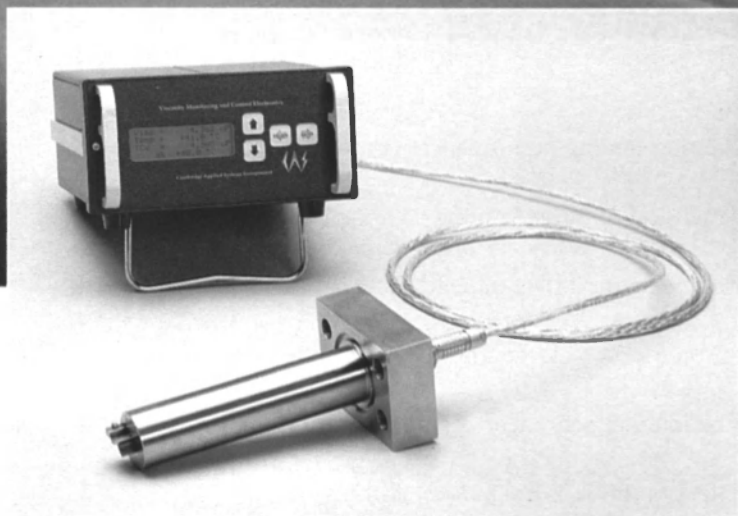
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(EFFECTIVE SEPTEMBER 1, 1997 AREA CODE 617 CHANGES TO 781)

Consolidation Continues To Sweep Diesel Engine Industry

The maritime diesel engine business continues to be a microcosm of international business trends as evidenced by the massive consolidation effort directed at creating internationally competitive conglomerates, with substantial efforts (and capital) dedicated to producing technologically advanced, environmentally-conscious products.

While there are far fewer competitors in the diesel engine segment than just four years ago, having fewer choices does not necessarily hamper vessel owner/operators or shipyards, as performance and price competition remains fierce among engine builders and suppliers.

The diesel engine business is truly an international one, and those companies positioned for long-term success are equally able to supply a

unit for a newbuilding project in the Gulf of Mexico as they are for a re-power in Singapore. Global presence, sales and service is no longer an attractive marketing point, it is the price of admission to growing business.

While international, national and regional environmental regulations continue to tax the budgets of even the highest quality owner/operators, diesel engine manufactures are increasingly called upon to provide economical solutions, developing and delivering power systems which are environmentally compliant, powerful and efficient.

The following is a directory of diesel engine suppliers from around the world, followed by news of recent product introductions.

DIESEL ENGINE SUPPLIER GUIDE

Product Key

Diesel Engines...DE
 Diesel Engines (low speed)...DE(ls)
 Diesel Engines (medium speed)...DE(ms)
 Diesel Engines (high speed)...DE(hs)
 Gensets...GEN

A

Alaska Diesel Electric

4420 14th Ave. NW
 P.O. Box 70543
 Seattle, WA 98107
 Tel: (206) 789-3880
 Fax: (206) 782-5455
 E-Mail: ADE@northern-lights.com
 Kurt Hoehne
 Product(s): DE(ms,hs); GEN

C

Coltec Industries-Fair Banks Morse Engine Division

701 White Ave.
 Beloit, WI 53511
 Tel: (608) 364-8100
 Fax: (608) 364-8233
 Nancy L. Stiener
 Product(s): DE(ms)

Cummins Marine

4500 Leeds Ave., Suite 301
 Charleston, SC 29405-8521
 Tel: (803) 745-1585
 Fax: (803) 745-1549
 E-Mail: wavemaster@cummins.com
 Geoff Conrad

Product(s): DE(ms, hs)

D

Daytona Marine Engine Corp.

1815 North U.S. 1
 Ormond Beach, FL 32174
 Tel: (904) 676-1140
 Fax: (904) 676-0164
 George Inhofer
 Product(s): DE(ms, hs); GEN

Deere Power Systems

3801 W Ridgeway Ave.
 Waterloo, IA 50701
 Tel: (800) 533-6446
 Fax: (319) 292-5075
 E-Mail: jdpower@deere.com
 Tom Withers
 Product(s): DE(ms)

Detroit Diesel Corporation

13400 Outer Drive West
 Detroit, MI 48239-4001
 Tel: (313) 592-5153
 Fax: (313) 592-5058
 Nancy Martin
 Product(s): DE(hs); GEN

Dieselmotorenwerk Vulkan GmbH

Werftallee 13
 18119 Rastock, Germany
 Tel: +49 381 1232130
 Fax: +49 381 1232132
 G. Bialowons
 Product(s): DE(ls)

G

GEC Alsthom Ruston Diesels

Vulcan Works, Newton-LE-Willows

Merseyside, England WA3 2EP

Tel: +44 1925 225151
 Fax: +44 1925 222055
 Malcolm Siberry
 Product(s): DE(ms); GEN

I

Inland Detroit Diesel-Allison

210 Alexandra Way
 Carol Stream, IL 60188
 Tel: (630) 871-1111
 Fax: (630) 871-8997
 James Angelos
 Product(s): DE(ms, hs); GEN

K

Kawasaki Heavy Industries, Ltd.

4-1 Hamamatsu-cho 2 Chome, Minato-ku
 Tokyo, Japan, 105
 Tel: +81 3 3435 2374
 Fax: +81 3 3435 2022
 T. Matsuzaki
 Product(s): DE(ls, ms)

KHD Canada

4420 Garand St.
 St. Laurent, Quebec
 Tel: (514) 335-3150
 Fax: (514) 332-4173
 R. Radtke
 Product(s): DE(ms, hs); GEN

Klattenberg Marine Agency

17 Grandview Ave.
 W. Orange, NJ 07052
 Tel: (201) 731-4018
 Fax: (201) 325-3681
 E-Mail: shipfix@aol.com

Richard Klattenberg

Product(s): DE(ls)
 (Klattenberg Marine Agency represents Stork Services B.V., a manufacturer of slow-speed diesels; TurboNed B.V., a manufacturer of turbochargers; Soteco International, a manufacturer of fuel oil purifiers; and Crane Heatex Ltd., a manufacturer of charge aircoolers)

M

MaK Motoren GmbH

Falckensteiner Str. 2, D-24159 Kiel, Germany
 P.O. Box, D-24157 Kiel, Germany
 Tel: +49 431 3995-01
 Fax: +49 431 3995-157

MaK Americas, Inc.

7555 Danbro Crescent
 Mississauga, Ontario, L5N 6P9
 Tel: (905) 542-7810
 Fax: (905) 542-7812

Makita Corporation

4-1-1, Asahi-Machi Takamatsu, 760, Japan
 Takamatsu Kapawa Pref., Japan
 Tel: +81 878 21 5501
 Fax: +81 878 21 5510
 Tautamu Adachi
 Product(s): DE(ls)

MAN B&W Diesel

17 State St., 18th Floor
 New York, NY 10004
 Tel: (212) 269-0980
 Fax: (212) 363-2469
 E-Mail: manbw@ix.netcom.com
 Les Gingell
 Product(s): DE(ls, ms); GEN

MAN B&W Diesel

Stadtbachstr 1
 86153 Augsburg, Germany

Tel: +49 821 3220
 Fax: +49 821 3221655
 Werner Haselboeck
 Product(s): DE(ls, ms); GEN

Man B&W Diesel A/S-Alpha Diesel

Niels Juels Vej 15
 DK-9900 Frederikshaun, Denmark
 Tel: +45 96 20 44 00

Fax: +45 96 20 40 30
 E-Mail: alpha@manbw.dk
 T. Klingenberg
 Product(s): DE(ls, ms)

MAN B&W Diesel A/S, Holeby

4913 Holeby, Denmark
 Tel: +45 54693386
 Fax: +45 54693040
 Peter Dan Petersen

Product(s): DE(ms); GEN

Mitsubishi Heavy Industries, Ltd.

5-1 Marunouchi 2-chome
 Chiyoda-ku, Tokyo, Japan, 100
 Tel: +81 3 3212 9080
 Fax: +81 3 3212 9779
 Yusuru Ichimasa
 Product(s): DE(ls, ms); GEN

MTU Friedrichshafen

88040 Friedrichshafen, Germany
 Tel: +49 7541 90 2817
 Fax: +49 7541 90 2724
 E-Mail: Burkart.Feurer@mtu.mercedes-benz.com
 Burkart Feurer
 Product(s): DE(hs); GEN

N

Northrop Grumman Corporation

401 E. Hendy Ave.
 P. O. Box 3499
 Sunnyvale, CA 94088-3499
 Tel: (408) 735-2886
 Fax: (408) 735-4419
 Jim Gilbert

S

S.E.M.T. Pielstick

2, Quai de Seine, BP n° 75
 93202 Saint-Denis Cedex, France
 Tel: +33 148097600
 Fax: +33 148097878
 M. F. Hylander
 Product(s): DE(ms, hs)

STN Atlas Elektronik GmbH

Behringstrasse 120
 D-22763 Hamburg, Germany
 Tel: +49 40 8825 2720
 Fax: +49 40 8825 4102
 R. Swoboda
 Product(s): GEN

Stork Services B.V.

Klompemakerstraat 71
 3194 DD Hoogvliet RT, the Netherlands
 Tel: +31 10 2310555
 Fax: +31 10 4163842
 Michel Kurzer
 Product(s): DE(ls)

U

Ulstein Bergen A.S.

P.O. Box 924
 5002 Bergen, Norway
 Tel: +47 55 199000
 Fax: +47 55 199104
 Magnus Bernson/Odd M. Horgen
 Product(s): DE(ms); GEN

Volvo Penta of the Americas

1300 Volvo Penta Dr., Chesapeake, VA 23320
 Tel: (804) 436-2800
 Fax: (804) 436-5150
 Ed Monacchio
 Product(s): DE(hs)

W

Wärtsilä NSD Finland Oy

Marketing Communications Center
 P.O. Box 252, FIN-65101 Vaasa, Finland
 Tel: +358-6-3270
 Fax: +358-6-327-1373

Wärtsilä NSD Switzerland Ltd.

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 CH-8401 Winterthur, Switzerland
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How nodular iron pistons make a Lugger your best engine value.

The heart of a diesel is the piston. It's design and ability to withstand intense heat and pressure is critical to your vessel's operation.

Lugger 125, 140 and 170 series diesels from 400 to 1300 horse-power are the only engines in their class with one piece, nodular iron pistons. This metallurgical breakthrough gives you more power, longer engine life and lower fuel costs than engines with aluminum pistons.

Here's how:

- One piece design eliminates failures associated with two piece pistons.
- 1. Combustion chamber with centered fuel injection point thoroughly mixes fuel and air for more complete, clean combustion and fuel economy.
- 2. Iron is stronger and has a higher melting temperature than aluminum, allowing the top compression ring to be closer to the piston crown. The combustion dead zone is minimized and fuel economy is increased.
- Equal thermal expansion of the piston and liner allows a closer fit,



- reducing piston slap. Engine noise is reduced.
- 3. Keystone shaped compression rings reduce carbon buildup and ring sticking during light load and idle speed operation. Fewer service calls.
- 4. Oil sprayed into the piston gallery cools the piston crown, allowing higher combustion temperatures for more power output per c.i.d., less exhaust smoke and more efficient use of fuel.
- Tuftride nitrate surface treatment holds lube oil and prevents scuffing.
- 5. Massive wrist pin and wedge shaped connecting rod boss

increases effective bearing area to carry higher firing load. More power output.

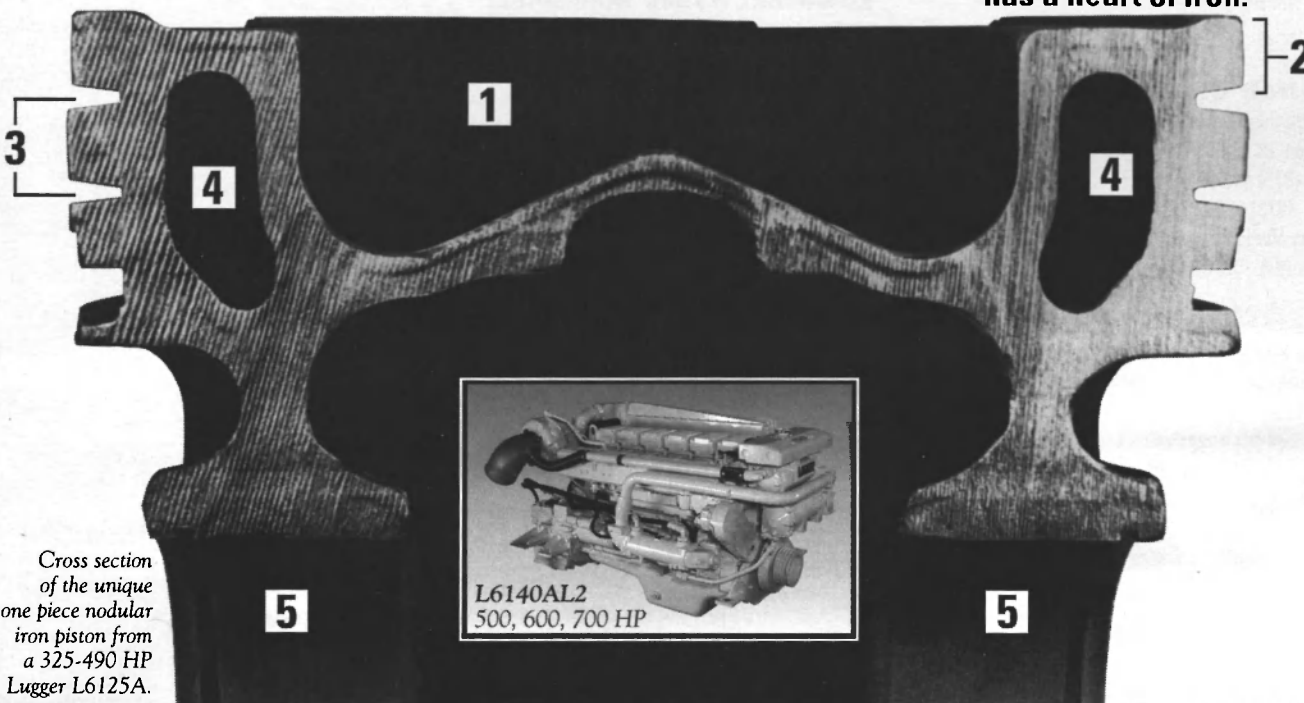
- Strong but light. A 700 HP Lugger iron piston weighs only 8.7 lbs. A competitive aluminum piston is 7.6 and a two part steel/aluminum is 9.7.

Iron pistons are just one of many technically advanced features making a Lugger the best marine engine value for your new vessel or repower project.

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 Alaska: 1-800-478-3006
 Northeast: 1-800-480-4223
 Southeast: 1-800-843-6140
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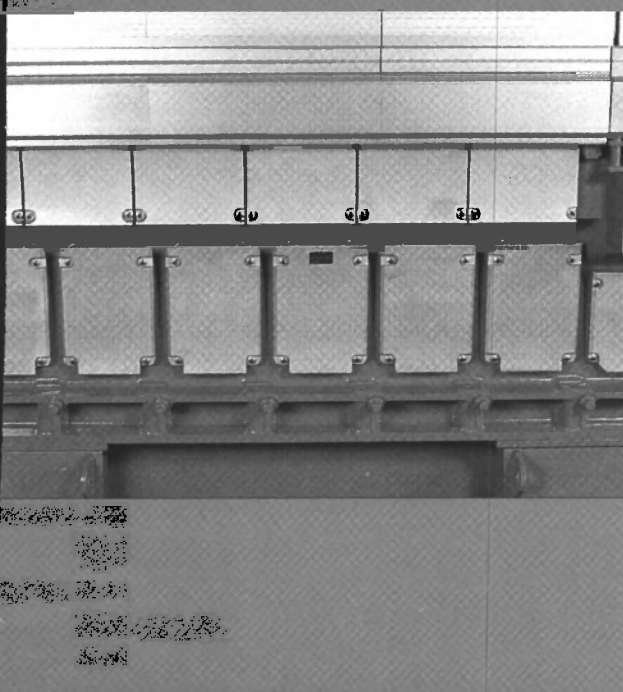


Cross section of the unique one piece nodular iron piston from a 325-490 HP Lugger L6125A.

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The merger of Wärtsilä Diesel and New Sulzer Diesel brings to the market a global engineering corporation with the widest range of engines and power systems in the industry. Wärtsilä NSD's renewed diesel and gas engine portfolio covers high-, medium- and low-speed engines and propulsion systems under the Wärtsilä and Sulzer brands from 500 to 66,000 kW (700 – 90,000 bhp). Combined with the worldwide network of own sales and service companies and licensees, it makes Wärtsilä NSD your partner for successful shipping.



WÄRTSILÄ NSD
CORPORATION

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Formed by the merger of Wärtsilä Diesel and New Sulzer Diesel.

Design And Development Of A New V-Type Diesel Engine

When Ulstein Bergen was designing the BR engine in the mid-1980s, the company had started with the intention of designing a series of in-line and V-versions which spanned the power range

and shared efficiencies via common components. However, the company astutely concluded that, at the time, neither company resources nor market demand warranted a full scale roll-out. To prepare for when the time would be right, studies were designed and the main principles and dimensions were laid down for a new V-engine based closely on the BR.

The engine embodies many important firsts for the Norwegian engine builder. It is the first V-engine from the company which features a single piece engine block, and it is, in fact, the most intricate block the company has ever designed. This is the first engine the company has created which was fully designed via a CAD program, a fact which helped ensure further accuracy and efficiency.

Now the new engine is here — after having made its debut at Nor-Shipping in Oslo — and it represents the fulfillment of the V-engine project with a complete family of six, eight and 9-cylinder in-line engines, and 12, 16 and 18-cylinder V-engines in due course. This development means that the company will soon offer a complete engine range between 2,600 and 7,800 kW at 720/750 rpm, running on diesel oil and heavy fuel.

The compact layout of Ulstein Bergen's V-engine is intended for use in many advanced machinery arrangements, particularly where high powers are required, such as in many types of offshore supply vessels, large ferries, RoRos and cruise ships.

The BV-range at 720/750 rpm for 60/50 Hz offers high power with compact dimension, combined with

favorable noise and vibration signatures. In addition, a gas-powered version is under development which will complement the company's KV-G range of lean burn gas engines in the power station market between 4.5 and 6 MW.

Special design features include:

Fully bore-cooled combustion chamber components (new in that class) designed for optimum balance between thermal and mechanical loading;

A special injection pump base designed to avoid fuel leakage into the lubrication system;

Cleaning/lubrication system for the fuel pump racks;

Features to accommodate future high ratings: an extra-strong fire deck in the cylinder head (80 mm thick) to enable high pressures; six cylinder-head studs to secure good sealing at such ratings, etc.

Technical Details

For ease of manufacture and repair, cooling water distribution is through large pipes along each cylinder bank. The same philosophy also lies behind the design of the main oil channel, which is comprised of pipe sections supported in the main bearing walls.

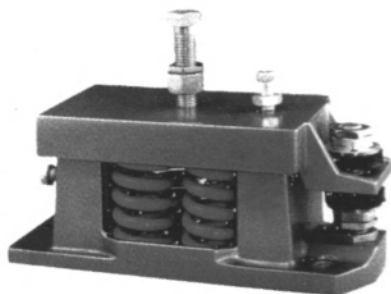
The crankshaft is of the underslung type, with large main bearing caps secured by vertical and

(Continued on page 41)

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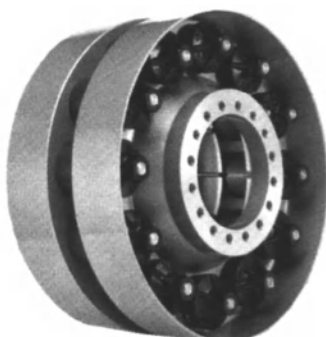
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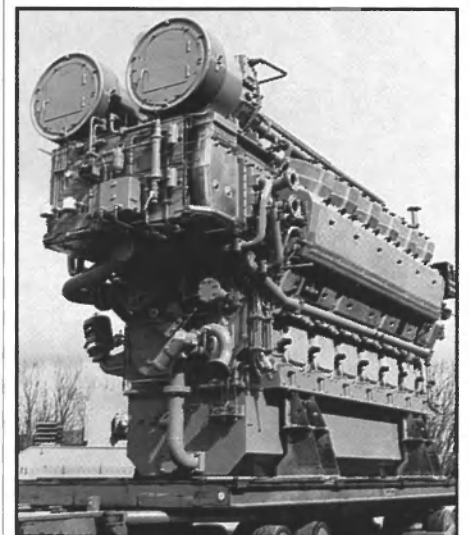
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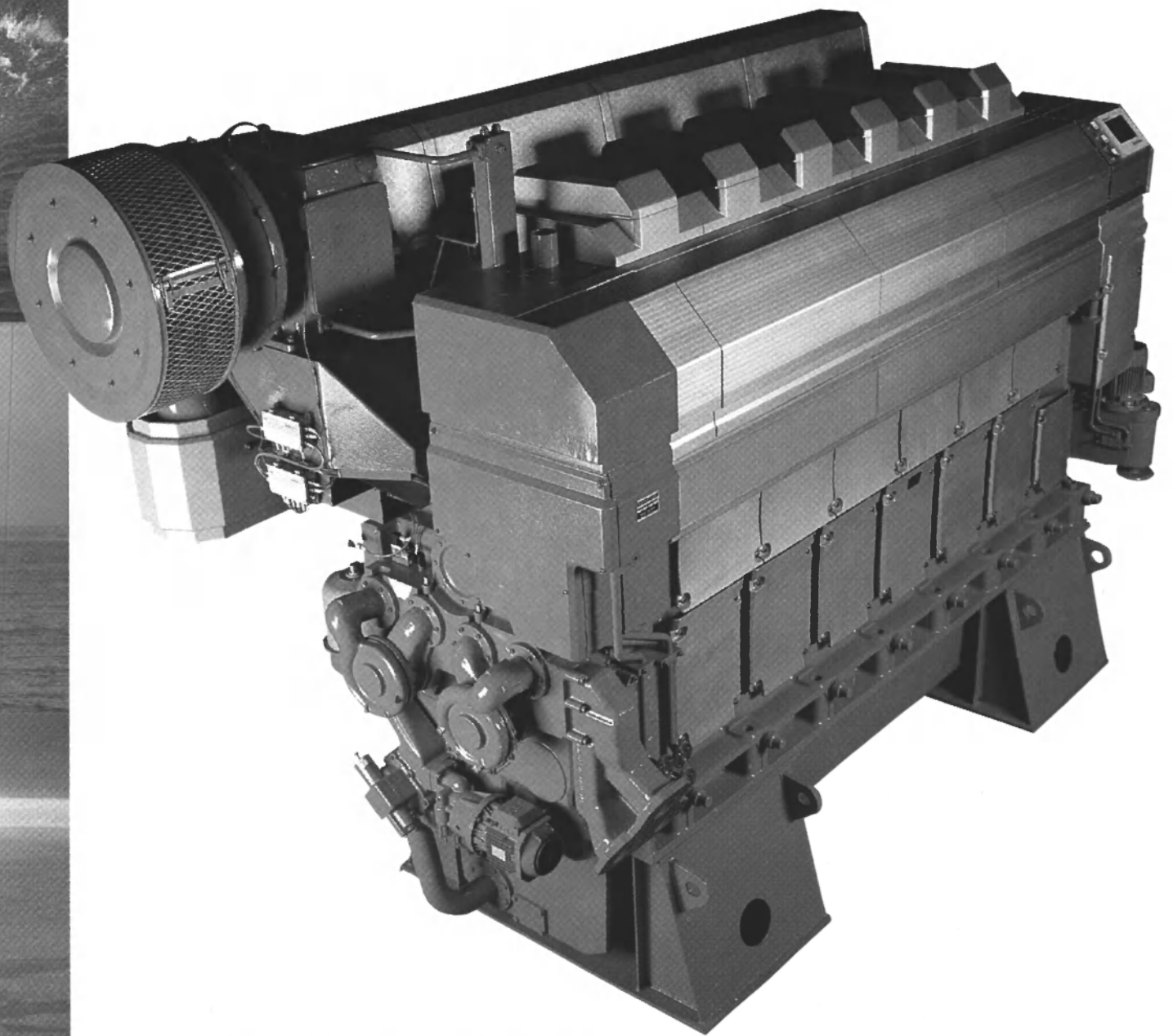
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Circle 281 on Reader Service Card



A new engine from Ulstein.

The Performer



Wärtsilä NSD introduces Wärtsilä 32 – the Performer. A whole new engine concept in the 2700 to 8280 kW output range. The new medium-speed engine integrates reliability, economy and ecology in a way that meets even the toughest requirements.

The engine's reliability is based on a modular design with integrated functions. Such as the engine block's integrated channels for oil and water and the engine-integrated monitoring and control system.

Its durability is based on using the most wear-resistant materials and innovative technical solutions in all engine parts to extend their lifetime to the maximum.

Thanks to the engine design which enables high firing pressures and effective turbocharging, the engine's fuel efficiency is excellent.

Coupled with built-in low NOx combustion as standard, the Wärtsilä 32 gives a performance that lives up to all standards. Wherever the stage might be.

The stage



WÄRTSILÄ NSD
CORPORATION

Circle 318 on Reader Service Card

ABS Publishes Guide On Propulsion Redundancy

ABS has developed and published a new reference tool — *Guide for Propulsion Redundancy* — which applies to propulsion and steering systems designed to provide enhanced reliability and availability through functional

redundancy. "ABS has developed practical and effective standards within the new guide after extensive discussions and input from the industry," said ABS Chairman **Frank Iarossi**.

Within the marine industry, interest in the reliability concept has increased, particularly in its application to ships navigating environmentally-sensitive areas.

In addressing these concerns, the guide provides guidelines which should assist in reducing the risks of damage and injury, as well as the economic and environmental consequences stemming from failures causing loss of propulsion or steering capability. This risk reduction is achieved through varying degrees of redundancy.

The aim of the new standards is

to establish a system whereby a single failure will not incapacitate a vessel, but leave it capable of maintaining course and maneuverability at reduced speed without assistance from another vessel, as well as its position under adverse weather conditions.

Falk Gears To Be Installed During Ferry Modification Project

Two Falk Corporation marine gear drives have been specified to help power passenger/auto ferries *Jos. Deschenes* and *Armand Imbeau*, which are both being lengthened from 203 ft. (62 m) to 269 ft. (82 m), increasing auto capacity from 56 to 75 vehicles.

The Falk marine drives, each with a 3.69:1 reduction ratio, will be driven by Caterpillar 3516 engines, which were upgraded from 1,410 hp at 1,200 rpm to 1,650 hp at 1,200 rpm. The Falk reduction gear drives are rated Lloyd's Ice Class 1AS. Voith fluid couplings were specified and fitted by Falk on the drives' input shafts to help absorb shock during winter operation.

For more information on Falk
Circle 18 on Reader Service Card

"Substantial reduction in lub oil consumption"

Regular deglazing and honing of engine cylinder liner surfaces can cut your lub oil costs dramatically. It can also notably increase time between overhauls while improving the service life of your engines.

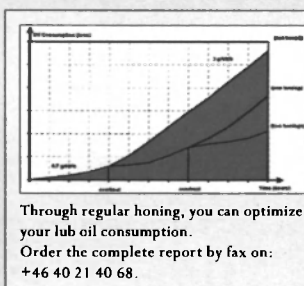
Chris-Marine develops methods and manufactures portable engine maintenance machines, tailored for all types of slow speed and medium speed marine and stationary diesel engines. Precision made machines for deglazing and honing, surface and valve grinding, wear edge and carbon deposit removal.

Decades of close co-operation with major engine manufacturers ascertains that the Chris-Marine precision machines are the obvious choice of cost-conscious shipping companies.

Contact us to find out how you can improve efficiency and save money.

CHRIS-MARINE

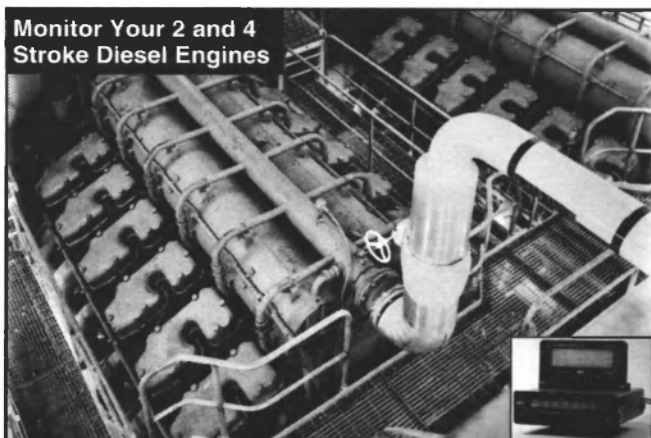
THE OPTIMUM SOLUTION



“The substantial reduction in lub oil consumption and the resulting savings we have experienced since we began using Chris-Marine honing equipment is impressive.” *Claes Svensson, Chief Engineer, M/S Peter Pan, TT-Line, Hamburg.*

CHRIS-MARINE AB, P. O. Box 9025, S-200 39 Malmö, Sweden. Phone +46-40 21 03 20, Fax +46-40 21 40 68. AUSTRALIA: Phone +61 2 9667 2345, Fax +61-2 9317 4447. B.W.I.: Phone +1-345 949 8132, Fax +1-345 949 9176. CROATIA: Phone +385-51 514 129, Fax +385-51 227 820. GERMANY: Phone +49-40 538 3845, Fax +49-40 538 3847. JAPAN: +81-78 302 2870, Fax +81-78 302 2870. NORWAY: Phone +47-3279 8590, Fax +47-3279 8509. SINGAPORE: Phone +65-268 8611, Fax +65-264 3932. SPAIN: Phone +34-1 575 2960, Fax +34-1 578 3898. U.S.A. East: Phone +1-904 354 6566, Fax +1-904 358 7862. U.S.A. West: Phone +1-253 593 3963, Fax +1-253 593 3962.

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Business Is Booming For Spanish Propeller Companies

A contract for the design and supply of 10 propellers for a series of 45,000-dwt bulk carriers to be built by Polish shipyard Stocznia Szczecinska has been won by a joint bid from Spain's Sistemar — which will design the advanced CLT design propellers — and Navalips — which will produce the propellers.

The 10 vessels were designed for Chilean shipping company CCNI. The owner's preference for CLT propellers was largely responsible for the order being placed with Sistemar and Navalips. The first propeller is due to be delivered later this year, with five more to be delivered in 1998 and the remaining four in 1999. The four-blade propellers are made of a nickel/aluminum/bronze combination, and each has a 6,200-mm diameter and weighs approximately 22 tons.

Specifications for a series of vessels on order at the same shipyard for Polish Steamship Co. also call

Hydrocomp Forges Partnerships, Launches Smart Engine

HydroComp and its European partner, Design Systems & Technologies, recently formed a partnership with Kobelt Manufacturing Ltd. The immediate result of the partnership is a new-generation software tool, Smart Engine, which was launched at the recent Nor-Shipping exhibition in Oslo. Smart Engine is a machinery monitoring analysis and

control application, developed in response to a growing demand for energy-efficient operation of propulsion systems.

The system, after development for more than a year, monitors engine performance and allows users to analyze and optimize voyage management from the propulsion standpoint.

Smart Engine is a modular application, designed for maximum flexibility and portability, lending itself for use onboard (tactical operation) and onshore (strategic decision making). To date, Smart Engine is comprised of the fol-

lowing modules: Smart Engine Data Acquisition; Smart Engine Real Time (monitoring); Smart Engine Analysis Library; Smart Engine Fuel Consumption (under development); and Smart Engine Trip Management.

The current version of Kobelt's electronic controls was originally designed in 1993, and the controls use the Motorola 68000 and HC11 microprocessors to monitor and control all systems.

For more information on Smart Engine
Circle 172 on Reader Service Card

for CLT propellers, and Sistemar has already been commissioned with the design. Sistemar and Navalips have also recently won a contract to retrofit CLT propellers for three bulk carriers belonging to Cargill International of Geneva. These propellers will replace conventional design propellers on *Cherokee*, *Powhatan* and *Paiute*, and will weigh 39, 16.6 and 16.3 tons respectively. *Cherokee* is a 164,000-dwt bulk carrier and a sistership of *Comanche*, which already has a CLT propeller fitted. Comparative speed trials of these two vessels reportedly showed that the CLT propeller has increased ship speed by more than .6 knots at a constant propelling power.

For more information
Circle 19 on Reader Service Card

RGF Offers Advanced Biotreatment System

RGF Environmental Systems, Inc. has introduced its newest packaged treatment system — BioSorb — for the treatment and/or reclamation of sewage and biodegradable industrial waste waters. The new system is designed for a variety of applications including use in marinas and at oil drilling sites.

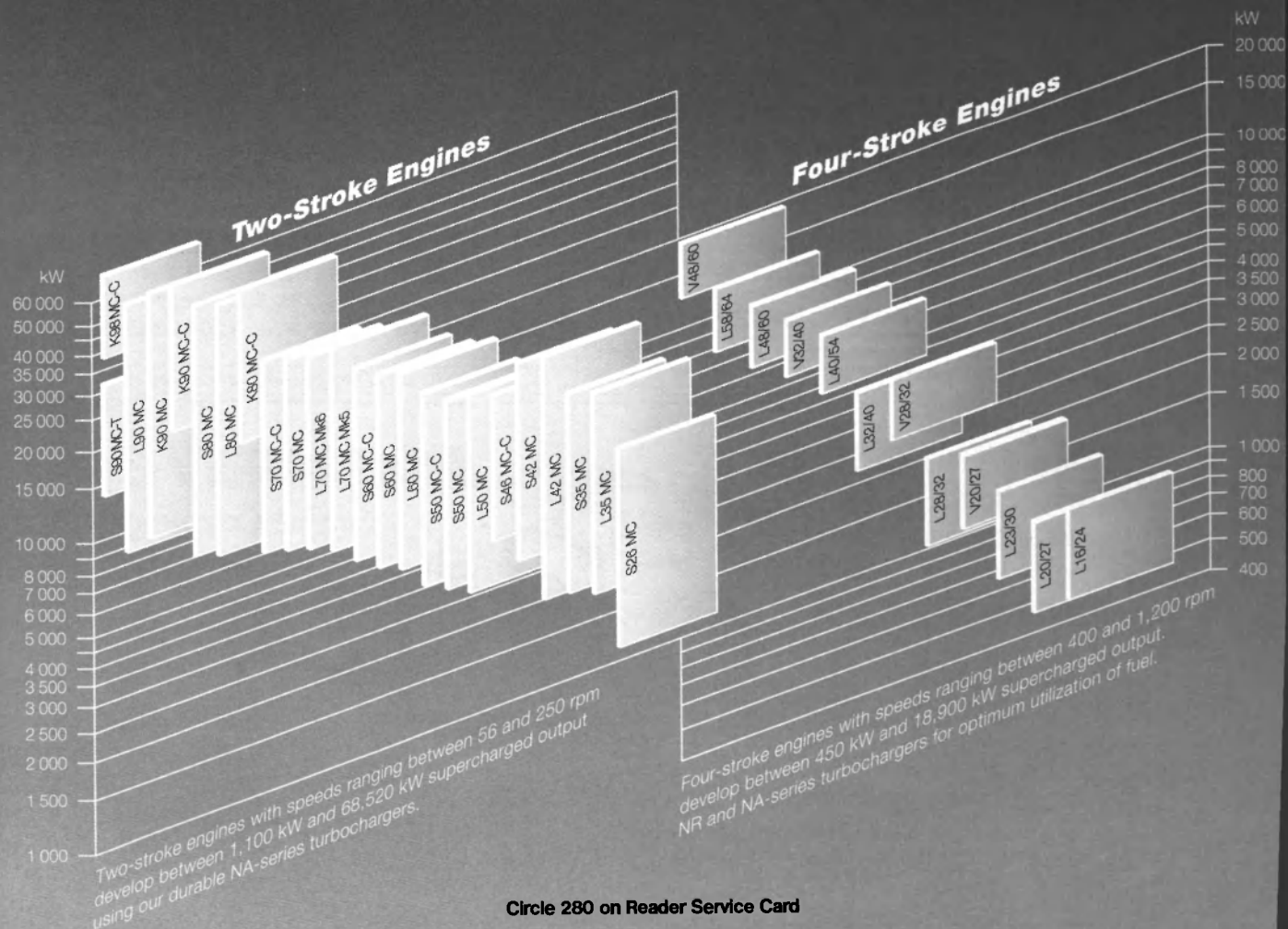
BioSorb consists of RGF's state-of-the-art process technology, including the company's catalytic oxidation process which destroys contaminants through oxidation. The system is designed to claim the waste water for irrigation or to discharge it, and is made of impact-resistant, carbon-charged, UV-protected polyethylene materials which reportedly eliminate corrosion and maintenance painting. The BioSorb system has been designed to exceed international codes for design and installation of small treatment works.

For more information on RGF
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July, 1997



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WORLDWIDE SERVICE

Northern Lights ML984 Arrives Quietly

The new Northern Lights ML984 generator set was designed to set new standards for noise and smoke emissions. The newest model to the line from Alaska Diesel Electric is rated at 32 kW for 60 Hz models, and 25 kW for the 50 Hz models. There are several features on the new

units which are designed to ensure a quiet ride. A double-walled oil pan, isolated valve cover, helical timing gear, soft mounts and a noise maze air intake silencer combine to reduce both vibration and noise. If additional noise dampening is required, Northern Lights offers

optional sound shields and hydroelastic mounts. To ensure ease of service, the ML984 has single-side servicing with easy-to-access, spin-on fuel and oil filters. There is also a lube oil drain for quick oil changes.

For more information on the ML984
Circle 171 on Reader Service Card

Willis Corroon Offers Insurance For Research Ships

A new specialist insurance program for research vessels has been developed by the Willis Corroon Group. The Taros program, designed by the group's Global Special Risks division, is designed to insure geophysical, oceanographic,

seismographic and general research vessels. It will cover equipment, personnel and onboard observers.

Griffin's Managing Director Resigns

Mike Meehan has resigned as managing director of Griffin Shipping Holdings Ltd., effective July 31. According to a joint statement issued by Griffin and its parent company, Grincor (Grindrod Unicorn Group Ltd.), his resignation was received with regret and Mr. Meehan's departure was on amicable terms.

Mr. Meehan, who has been with the Grincor group for 23 years, said he enjoyed an exciting career. "I have seen the group develop from a small coasting and agency company to a significant player in the freight transportation industry."

Company Profile: Uniservice

The history of Uniservice dates back to the early 20th century, as passenger and merchant steamships crossed the Suez Canal in order to reach the overseas territories of the Italian colonies. The condensers on these vessels experienced problems due to deposits of scale caused by salt precipitation in the pipes which were difficult to remove. Engineers often were forced to stop the engine and open the condenser covers to descale and mechanically clean the internal piping.

In 1920, Jean Urruty and Silvio Garbarino formed Urruty & Garbarino, a Savona-based company dedicated to producing chemical products. The company established itself in the Port of Genoa.

In 1974, the company changed its name to Urruty GG Niego, and since that time has become fully involved in the shipping industry, manufacturing a complete line of specialty chemicals, with operations throughout Italy and the Mediterranean.

In 1986, Erani Andreatta joined the group and, with the help of Giovanni Baldelli, set the Urruty group up for international expansion.

In 1991, A. Gaeta joined Urruty, setting up a consortium which led to Uniservice Consortium Urruty-Gaeta.

In the early 1990s, Uniservice was presented with the opportunity to establish a minority shareholders position in the newly formed Uniservice Americas. In 1995, another major opportunity presented itself to the Uniservice group, when key managers from a renowned international company elected to leave the organization that had purchased their company. This gave Uniservice the gateway it needed to become a worldwide presence, setting up distributors in countries such as

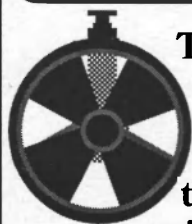
(Continued on page 58)

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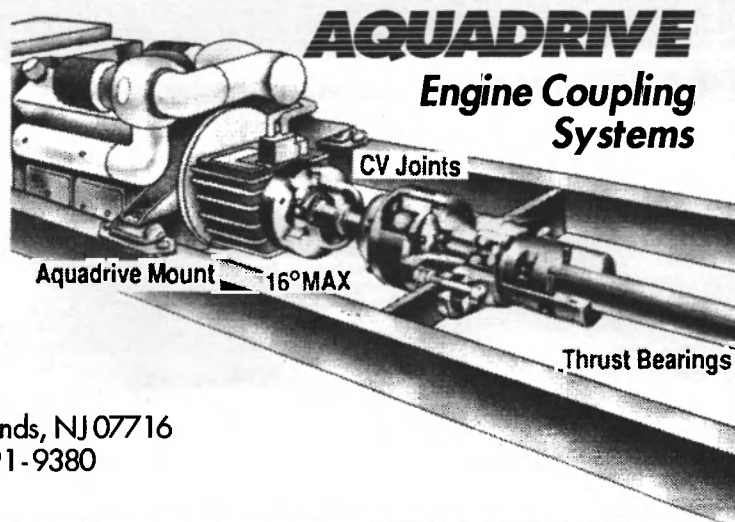
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Circle 21 on Reader Service Card

(Continued from page 36)

horizontal (hydraulically tightened) bolts of generous dimensions. Strong ribs lead from the six cylinder head bolts right down to the main bearing bolts to give a straight and uninterrupted force flow, and thus enable the very high firing pressures this engine is designed for (200+ bar). The crankshaft is a single piece forging of very high-grade steel; it is ground and polished and has a counterweight on each web. The main bearing diameter is increased compared with the BR but the crank pin diameter is the same. At the aft end is the camshaft drive via a split gear wheel, and at the forward end provision is made for fitting a torsional vibration damper, the elastically mounted gear wheel for auxiliary drives, as well the provision of a 50 percent power take-off.

The BV's single-piece engine structure enables the integration of several functions into the block and gives increased strength and stiffness.

For the larger BV-16 and BV-18, additional solutions — including all new exhaust and turbocharger systems — are under development.

For additional information on the new Ulstein Bergen engine
Circle 175 on Reader Service Card

First Order For Ulstein Bergen BV Engine

The first pair of BV series engines will be installed in a 262.4-ft. (80-m) anchor-handling tug supply (AHTS) vessel to be built for Simon Møkster Shipping of Stavanger, Norway.

They will be 12-cylinder units, type BVM12, each developing 5,294 kW (7,205 hp) at 750 rpm.

The vessel itself will be a variation of the UT722 design from Ulstein, and will be constructed by Hellesøy Skipsbyggeri AS for delivery in May 1998. It is the third UT722 to be ordered by Simon Møkster Shipping and will be about 16 ft. (5 m) longer than the first two vessels, with greater deck area and tank capacity.

MAN B&W Introduces New Medium-Speed Design

(see story on page 102 of this edition)

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Circle 248 on Reader Service Card

Wärtsilä Introduces Second Engine In High-Speed Family

Following the introduction of the Wärtsilä 200, Wärtsilä NSD has introduced a second contender in its line of continuous duty, high-speed engines, the Wärtsilä 170.

The Wärtsilä 170 was designed to provide high reliability and deliver low fuel consumption at low emissions, while offering high power density and easy maintenance.

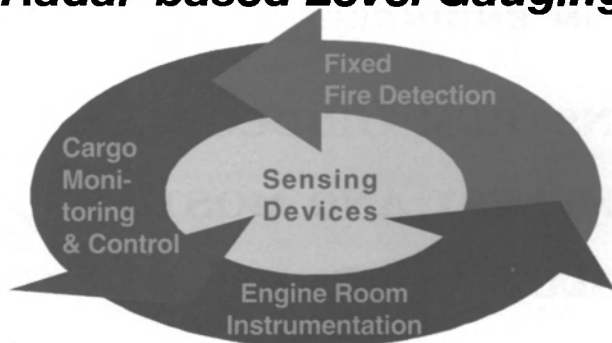
According to the manufacturer, the cylinder unit and crank gear are the areas in which the reliabil-

ity of the medium-speed engine is most visible in Wärtsilä 170. The piston is a composite design with an aluminum skirt and steel top, and the piston skirt is pressure lubricated — a patented design used in all other Wärtsilä engines. The cylinder liner also features an anti-polishing ring, and the combination of the pressure lubricated piston skirt and anti-polishing ring is designed to result in reliable piston operation and low oil

(Continued on page 102)

Autronica

Trend-Setter within Radar-based Level Gauging



1984

Introduction of the GL-90 radar-based level gauge.

**5,000 units delivered
Installed on 300 vessels**

1991

Introduction of pressure transmitter series GT200.

12,000 transmitters delivered

1993

Introduction of the Ex-LON network.

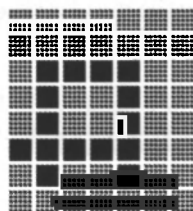
**20 systems delivered
4,000 sensing devices connected**

1997

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gauges to the international
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Maritime Instrumentation



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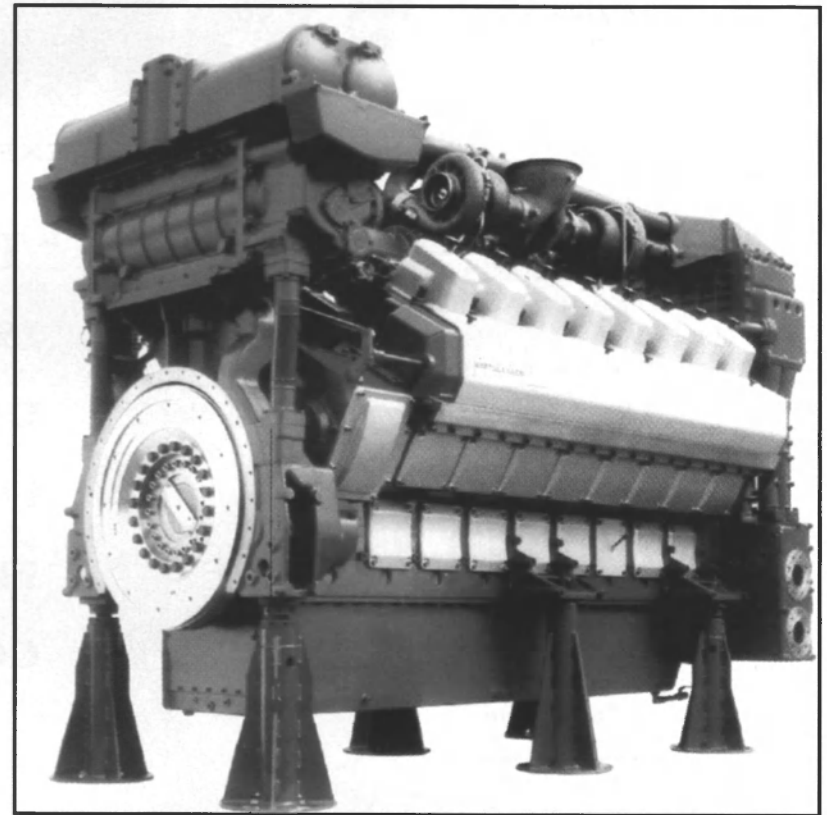
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CAD/CAM/CIM:

Selecting the Right System for Your Shipyard

The following article is based on the paper CAD/CAM/CIM Requirements for a World Class Commercial Shipyard, presented at the Society of Naval Architects and Marine Engineers (SNAME) 1997 Ship Production Symposium. The paper was based on the Phase II report of the National Shipbuilding Research Program Project 4-94-1. Contributing Writer **Jonathan M. Ross, P.E.**, is director of Engineering of Proteus Engineering in Stevensville, Md., where he is involved in computer-aided design, engineering and manufacturing for ships and shipyards in the U.S. and overseas.

One of the greatest challenges facing shipyards entering the world shipbuilding market is selecting a computer-aided system for ship design and production. Such systems, called CAD/CAM/CIM (computer-aided design and manufacturing, and computer-integrated manufacturing), may be developed by shipyards in-house, purchased from a third-party vendor, or may be a third-party system specially tailored to the requirements of the shipyard.

Selection Methodology

Not all shipyards will want, need or be able to afford to carry out all their engineering, design and production with computer software. A balance must be achieved between automated and manual methods. Thus, a selection methodology is needed to decide in which scenarios computers will best serve the needs of each shipyard. CAD/CAM/CIM selection is a melding of business and technology in the shipyard, and the first step in the selection methodology is for upper management to define the shipyard's strategic plan. In a larger sense, the selection methodology may be viewed as a way to align technology with business results. Two steps in this alignment include: planning for innovation, customization and opti-

mization; and using the theory of constraints to identify priorities.

Innovation, Customerization and Optimization

CAD/CAM/CIM technology requirements may be aligned to business objectives by using the following equation: $MS1 \times MS2 \times MS3 = \text{Profit}$; where $MS1 = \text{Market Size}$, $MS2 = \text{Market Share}$; and $MS3 = \text{Margin on Sales}$.

For example, if a shipyard has a 10 percent share ($MS2 = 10$ percent) in a \$100 million market ($MS1 = \100 million), and its margin on sales is 20 percent ($MS3 = 20$ percent), then $\$100 \text{ million} \times 0.10 \times 0.20 = \2 million Profit . The thinking in this approach is that everything a company does should improve at least one of these three areas. Thus, these areas can be used to track trends and evaluate alternative business actions. Looking at each area in detail provides further insight as to its use:

- **Market Size (MS1)** — Create or participate in attractive markets through new product innovation. Innovation drives market size.

- **Market Share (MS2)** — Win market share against competitors by providing products and services customers prefer. Customerization drives market share.

- **Margin on Sales (MS3)** — Earn healthy margins by some combination of earning a premium price and/or being the lower-cost provider. Optimization drives margin on sales.

Theory of Constraints

The Theory of Constraints is a way to focus on where to improve a

process. For example, a shipyard may want to improve throughput in a plate nesting and cutting operation. At first, the best approach may seem to be replacement of an existing manual cutting operation with robotics. Closer study may show that robotic cutting would reduce the number of personnel in the operation, but not increase throughput because of downtime while waiting to receive cutting data: robots or people could work only a fraction of the time and must wait the rest. Thus, throughput would remain as before. In this case, the constraint is the lofting operation, which slows down the overall throughput. If the lofting time is decreased (for instance, through CAD/CAM automation), then the constraint is removed. Knowing the constraints in the shipbuilding process will help a shipyard focus on how CAD/CAM/CIM technology can improve that process.

The Methodology

The selection methodology is a way for a shipyard to choose its CAD/CAM/CIM system. As mentioned above, this process must involve upper management and must be based on achieving business results. Thus, the selection methodology is business driven and not technology driven, as demonstrated in the following steps:

- Conduct business assessment;
- Define new processes;
- Identify priorities;
- Select requirements; and
- Select technologies.

CAD/CAM/CIM Requirements

Given this overview of the selec-

tion methodology, one may now focus on defining the requirements of the CAD/CAM/CIM system. These requirements form the building blocks of the system, and describe the processes that the computer will carry out. Requirements reside in a specific location in the overall software life cycle process; this location defines the role and the level of detail of requirements. The software life cycle process may be summarized as follows:

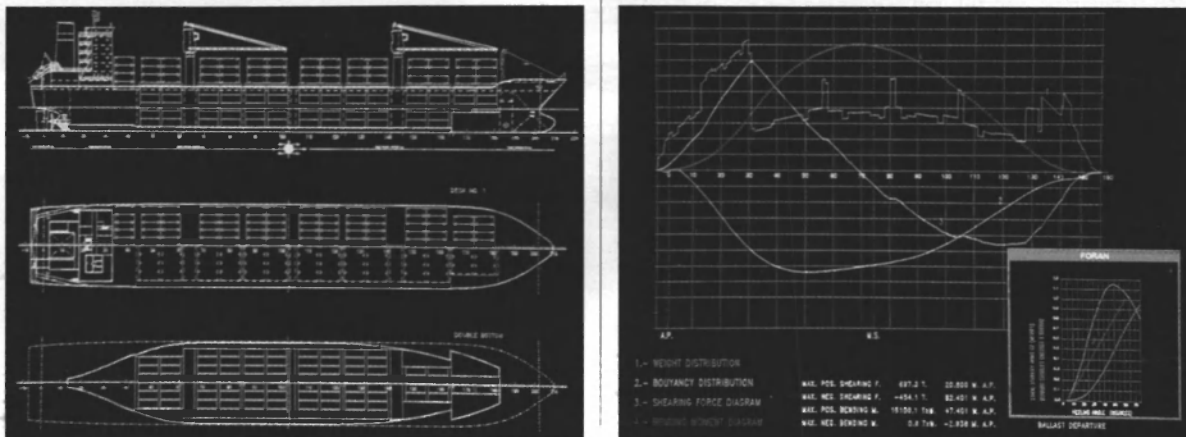
1. Determine user needs;
2. Develop software requirements;
3. Develop software specifications;
4. Conduct programming;
5. Test and debug;
6. Implement, train users;
7. Maintain; and
8. Decommission.

Requirements are located in step two. They are based on shipyard design and engineering needs and are couched in terms appropriate for software engineers to use as a basis for developing specifications and then carrying out the actual programming (steps three and four). In cases in which shipyards decide to select from existing software, the step two requirements serve as a benchmark against which to compare competing systems.

Requirements are not software modules; they are features of the software.

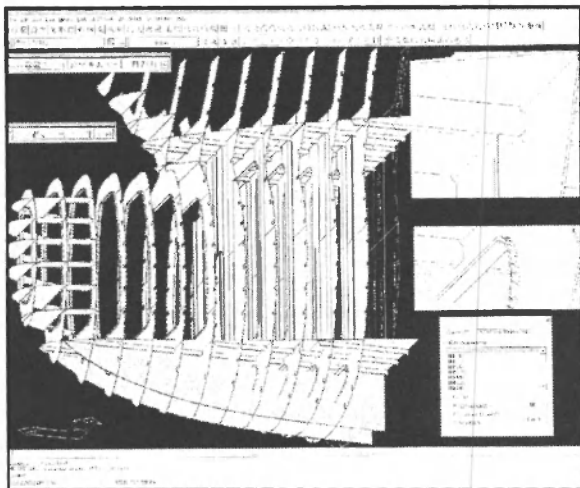
The requirements do not tell how to design the software, they simply state needs the software must fulfill. Thus, various solutions may exist, each of which may meet requirements, but in different ways.

The use of this approach, tailored to the needs of the individual shipyard, will help ensure that the selection of CAD/CAM/CIM software meets the business needs of the organization by providing for the needs of designing and producing ships in a manner that is competitive in the world market.



Pictured above are screens from Sener's Foran V30 software, an example of a third-party computer software system.

ARL Announces ShipConstructor97



Albacore Research Ltd. (ARL) has designed new versions of its shipbuilding software, which when combined form the integrated suite of programs named ShipConstructor97. Together, the programs cover all aspects of ship hull production from fairing and lofting through parts detailing, nesting and NC processing and report generation. All new software is designed to take advantage of the latest Windows NT and Windows 95 features and to run on PCs.

The new program versions will include the following: ShipCAM97, which stores all shareable data and parts in a Microsoft Access database; CAD-Link97, which provides 3-D ship structural modeling at 2-D ease; NC-Pyros97, an NC-code generator for gas and plasma burning machines which converts CAD drawings to an NC-code; and ShipReporter97, which consists of several functions to produce printed production information such as a bill of materials, assembly sequences and nest reports.

For more information on Albacore
Circle 4 on Reader Service Card

Baystate Technologies, Inc.

Baystate Technologies, Inc. has released CADKEY 97 – a major enhancement release of the CAD-KEY mechanical Computer-Aided Design (CAD) software program for Windows 95, NT 3.51 and 4.0. The new program reportedly offers solid modeling capabilities, an exclusive wireframe-to-solid converter, macro support, direct web page linking and an optional CADKEY classic DOS-like interface.

“CADKEY 97’s freeform hybrid modeling gives designers the freedom to apply the design tool of their choice to the job at hand – from wireframe to surface modeling,” commented **Robert Bean**, president and CEO of Baystate Technologies.

For more information on Baystate
Circle 3 on Reader Service Card

KCS TRIBON Vitesse

Kockums Computer Systems offers its new TRIBON Vitesse application, a modification of the original TRIBON software for ship design and production. TRIBON Vitesse reportedly enables the user to choose his or her own Vitesse programs, based on direct access to the TRIBON Product Information Model, while at the same time provides all the functionality of available TRIBON applications.

TRIBON Vitesse was developed in close cooperation between KCS and shipyard Chantiers de l’Atlantique. KCS anticipates that TRIBON Vitesse will lead to a change in ship design efficiency through rule-based automated design for different types of structural arrangements and outfit layouts. The program can reportedly be used for creating the smallest of design features to major sections of ships.

TRIBON is an integrated design and information system created for the shipbuilding industry. TRIBON applications cover all aspects of ship design, from initial design to production, including advanced features from the assembly phase of ship production and materials control.

For more information on KCS
Circle 1 on Reader Service Card

Verisurf Software, Inc.

Verisurf Software, Inc. has released VERISURF, a Windows-based, multi-surface inspection and analysis software

program that aids in manufacturing Quality Control. Using data collected from a Coordinate Measuring Machine (CMM), Tracker, Theodolite or other inspection device, VERISURF compares a machine part with a 3-D CAD model of the part. VERISURF measures and analyzes the deviation between the 3-D CAD model and the inspection data. The CAD model can be imported from virtually any CAD

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Halifax, Nova Scotia, Canada
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Circle 260 on Reader Service Card

CAD/CAM REVIEW

system, or created with VERISURF's CAD drawing tools. Once the part is analyzed, VERISURF provides easy-to-interpret, instant topographical color and text reports to show which points on the part are in or out of tolerance. A color legend shows the

amount of deviation in different shades. For example, shades of red represent negative deviations, while shades of blue represent positive deviations. Points within the set tolerance limits are displayed in green. VERISURF will import and export CAD models using

industry standard data translators such as IGES, SAT, DXF, CADL, VDA, ASCII text and STL (StereoLithography). CATIA EXP and AutoCAD DWG translators are available as an option.

For more information on Verisurf Circle 13 on Reader Service Card

Dutch Firm Introduces Automatic Nesting Program For CAD/CAM

Dutch engineering firm Yachting Consult's latest development in its MasterSHIP CAD/CAM system is the inclusion of an automatic nesting program. The new program is fully integrated within AutoCAD, allowing it to run on a low-cost PC-platform under Windows and DOS.

The MasterSHIP nesting program, which was developed for typical shipbuilding parts in steel and aluminum, automatically fits parts in plates. Information on parts, such as marking lines for assembly purposes or part identification codes, stays attached to the parts during nesting.

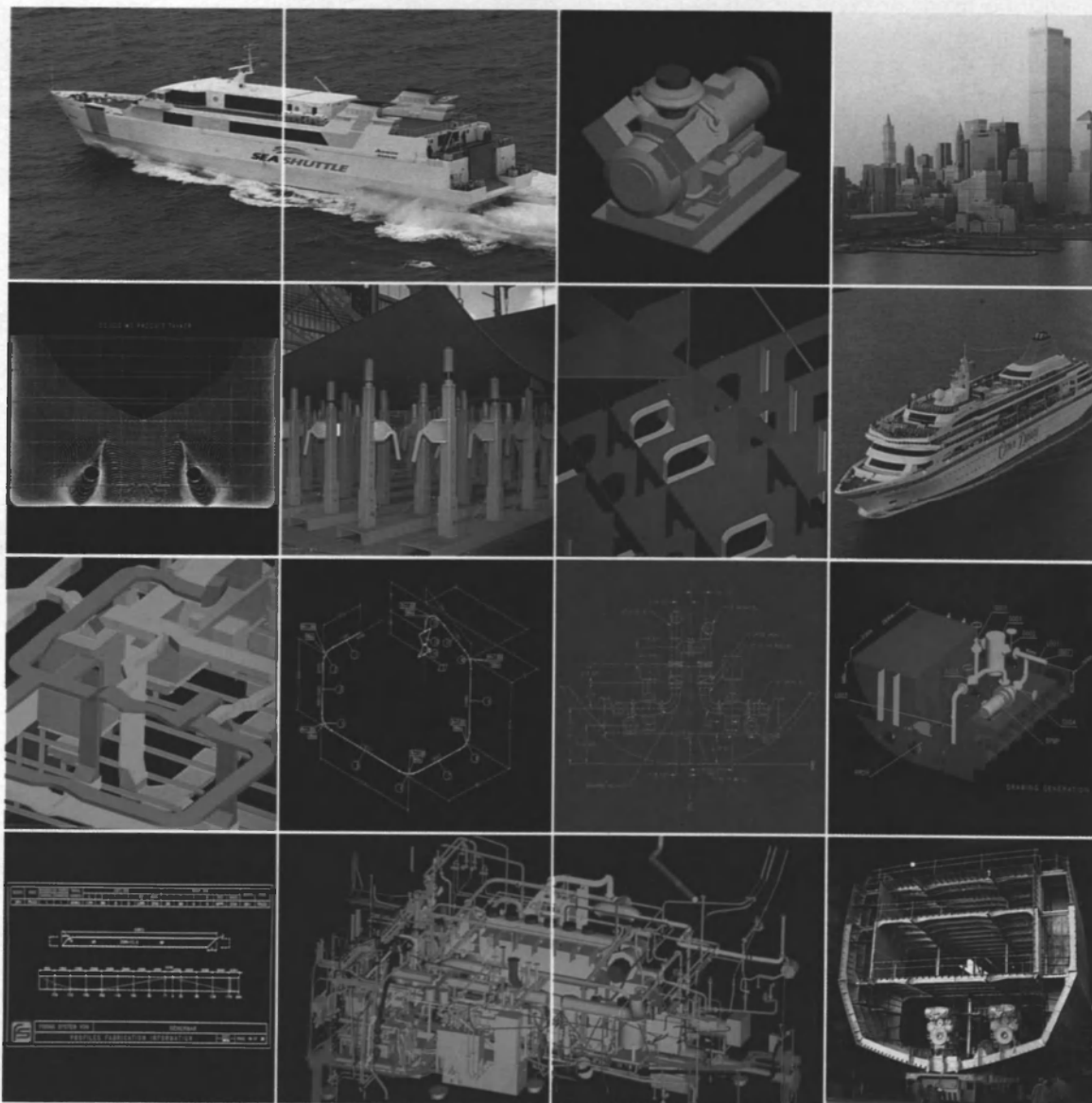
The system is suited for shipyards, engineering companies, design offices and specialized cutting centers.

MasterSHIP CAD/CAM software contains modules for three activities, namely construction drawing, lofting and expansion and cutting parts.

For more information on Yachting Consult Circle 2 on Reader Service Card

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Circle 299 on Reader Service Card

A Call For Increased Ship Scrapping

Dry bulk carrier shipowners were urged to encourage more vessel scrapping by their representative organizations. "We must address market balance and encourage scrapping, Intercargo's (International Association of Dry Cargo Shipowners) Chairman **Sverre Tidemand** said recently, continuing, "There is a grave danger that with the current substantial overhang of newbuildings and orders coupled with the absence of sufficient scrappings...the market will remain as soft."

He added the industry must resist the urge to heap on new regulations which can distract vessel masters from concentrating on their jobs. However, he said that proposals put forward by IMO to increase bulk carrier safety "provide a proper balance between risk and benefit and will be generally acceptable."



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ITALY: Transforming Its Maritine

by David Tinsley, technical editor

FINCANTIERI ...

... Closer focus on niche markets

Italy's contribution to European shipbuilding activity tends to be understated, partly because of historic rivalries and often outmoded perceptions within Europe itself. But the dynamism of the industry in Italy cannot be disputed, mirrored in the far-reaching restructuring of the state-owned sector and its forceful assertion in growth areas of the international market.

On the equipment manufacturing side, Italy's share of the business has contracted in the past 10 years. Yet, during what has been an exceedingly difficult period for European shipbuilders as a whole, Italy has retained traditional craft and technology skills, as well as outfitting strengths.

A characteristic flair for interior design — from which Italy's renaissance in passenger ship construction and refitting has benefited — complements the nation's technical and engineering know-how, which is now supported by microprocessor-based computational and analytical tools.

While state-owned Fincantieri has enjoyed a remarkable financial

turnaround in recent years, and now has hard-earned prominence in the cruise ship sector with an unmatched 40-plus percent market share in terms of gross tonnage, Chairman and CEO **Corrado Antonini** said there is no room for complacency.

An evolving market situation poses new challenges for the future, and even in the niche area of large, luxury passenger ship construction, the competitive pressures are intensifying. Quality, delivery and contractual performance are the guiding principles in a market where customer expectations have risen steadily.

Central to long-term success in the market, said Dr. **Antonini**, are project management skills, which have been continuously honed at the Monfalcone and Venice-Marghera yards since the group returned to the large passenger ship field in the mid-1980s.

Fincantieri has secured contracts since that time for a total of 21 cruise ships, to an aggregate value of more than Lire 11,000 billion. With 10 capital vessels delivered in the last seven years, the orderbook for the remaining 11 newbuildings

is worth more than Lire 6,500 billion. The new era was signaled by the seminal 70,000-gt sisters *Crown Princess* and *Regal Princess*, originally ordered by Sitmar and delivered to P&O Princess Cruises in 1990/91.

The float-out in May of the 85,000-gt *Disney Magic* marked an important juncture for the shipbuilder, given the enormous technical and project management demands of the two-ship Disney contract, and the value-intensity and strategic, commercial significance of the project to the cruise line.

While success has been enjoyed, Dr. **Antonini** warned that the restructuring process has to continue, to ensure that the group is best equipped to cope with the market situation. Changes already effected include a substantial reduction in the payroll, the sale of most of the repair yards to the private sector and the adaptation of the naval yards to facilitate a large-scale entry into the fast ferry market.

Fincantieri has strived to maintain a diversified business approach whereby steel-intensive

ships such as Aframax and Suezmax crude carriers and Panamax and larger bulkers have complemented production of ship types with a higher capital concentration. However, **Corrado Antonini** believes that the company will have to become more selective in its product range, and devote itself to a greater extent to niche markets.

Long an advocate of regional short sea shipping, he believes that Europe can offer expanding opportunities for RoRo ferries and other efficient forms of sea transportation as part of a modal shift of freight from the road system to coastal routes.

Fincantieri continues to target new opportunities in the cryogenic tanker sector, where it maintains an actual production presence, as currently expressed in the construction of a 65,000-cu-m LNG carrier for SNAM.

The recent delivery, in quick succession, of monohull fast ferries *SuperSeaCat One*, *Pegasus Two* and *SuperSeaCat Two*, highlights the group's level of commitment to the fast ferry sector. Forced to deal with reduced Italian defense spending, contractual success in the commercial field has meant that at least 50 percent of the activity of Fincantieri's naval ship division is accounted for by high-speed ferry design and construction. Another 20-25 percent of the division's business is generated by the mechanical products division, such that the actual warship building operation is down to less than 25 percent of activity.

The current program of MDV-series monohull vessels, employing both steel and aluminum alloy

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Model/Part	Type	Material	Weight	Vol	Area	RF
FP_124-02	PlatePart	AGS-Steel	1924.81	0.000	1573.754	
FP_124-03	PlatePart	AGS-Steel	102.00	0.000	177.000	
FP_124-04	PlatePart	AGS-Steel	102.00	0.000	177.000	
FP_124-05	PlatePart	AGS-Steel	4369.20	0.000	2106.254	
FP_124-06	PlatePart	AGS-Steel	3674.89	0.000	2126.488	
FP_124-07	PlatePart	AGS-Steel	688.62	0.000	6.578	
FP_124-08	PlatePart	AGS-Steel	1524.12	0.000	6.619	
FP_124-09	PlatePart	AGS-Steel	7711.90	0.000	306.699	
FP_124-10	PlatePart	AGS-Steel	1364.82	0.000	152.734	
FP_124-11	PlatePart	AGS-Steel	1936.00	0.000	254.000	
FP_124-12	PlatePart	AGS-Steel	275.50	0.000	2136.488	
FP_124-13	PlatePart	AGS-Steel	7711.90	0.000	306.699	
FP_124-02A	STIFFENER	AGS-Steel	90.30	0.000	646.000	

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Industry To Remain Competitive

hulls, includes the largest high-speed ferries ordered to date worldwide. Each of two MDV 3000 Jupiter class RoRos measures 479 ft. (146 m) long and is designed to convey 1,800 passengers and 460 cars, or up to 30 trucks plus 100 cars, at speeds of 40 knots using a CODAG (combined diesel and gas) installation.

Notwithstanding the successful

diversification and the perception of fast-going commercial vessels as a growth business sector, Dr. **Antonini** does not see high-speed ferries as a substitute for naval work. He stressed the need for a resumption of Italian fleet renewal, and is in doubt about the long-term importance of the naval sector to the group.

Fincantieri has continued to

invest in its capabilities in the naval field, in terms of both research and facilities. Although the most recent contract dates from 1993 when a fleet oiler was ordered, it seems that fresh work could be in the offing, given current requirements for two diesel-electric submarines and four high-seas patrol vessels.

In looking to further strengthen

the organization for the future, Dr. **Antonini** has an eye on the long-mooted withdrawal of intervention subsidies, and also on the longer-term implications of the growth in world shipbuilding capacity. This is already impacting price levels, and the Fincantieri head believes that "overcapacity is going to give problems to all of us, including those who created it."

Welcome to Cruise Ship Capitol! Pictured is Dr. **Corrado Antonini**, Fincantieri chairman and CEO, with *Disney Magic*



Fincantieri's stake in the new European force in diesel engineering, Wärtsilä NSD Corporation, is set to increase from the initial 12.2 percent to 15.4 percent. The Italian corporation received a cash payment of \$90 million as part of

the transaction. This saw the hitherto, wholly Fincantieri-owned, Swiss-based New Sulzer Diesel brought within the new entity, in which Wärtsilä Diesel's owner — Metra Corporation of Finland — has an 87.8 percent holding.

Wärtsilä NSD has in turn secured a 40 percent stake in the otherwise Fincantieri-owned Grandi Motori Trieste (GMT). The activities of the plant in northeastern Italy, which builds larger types of four-stroke engines as well as

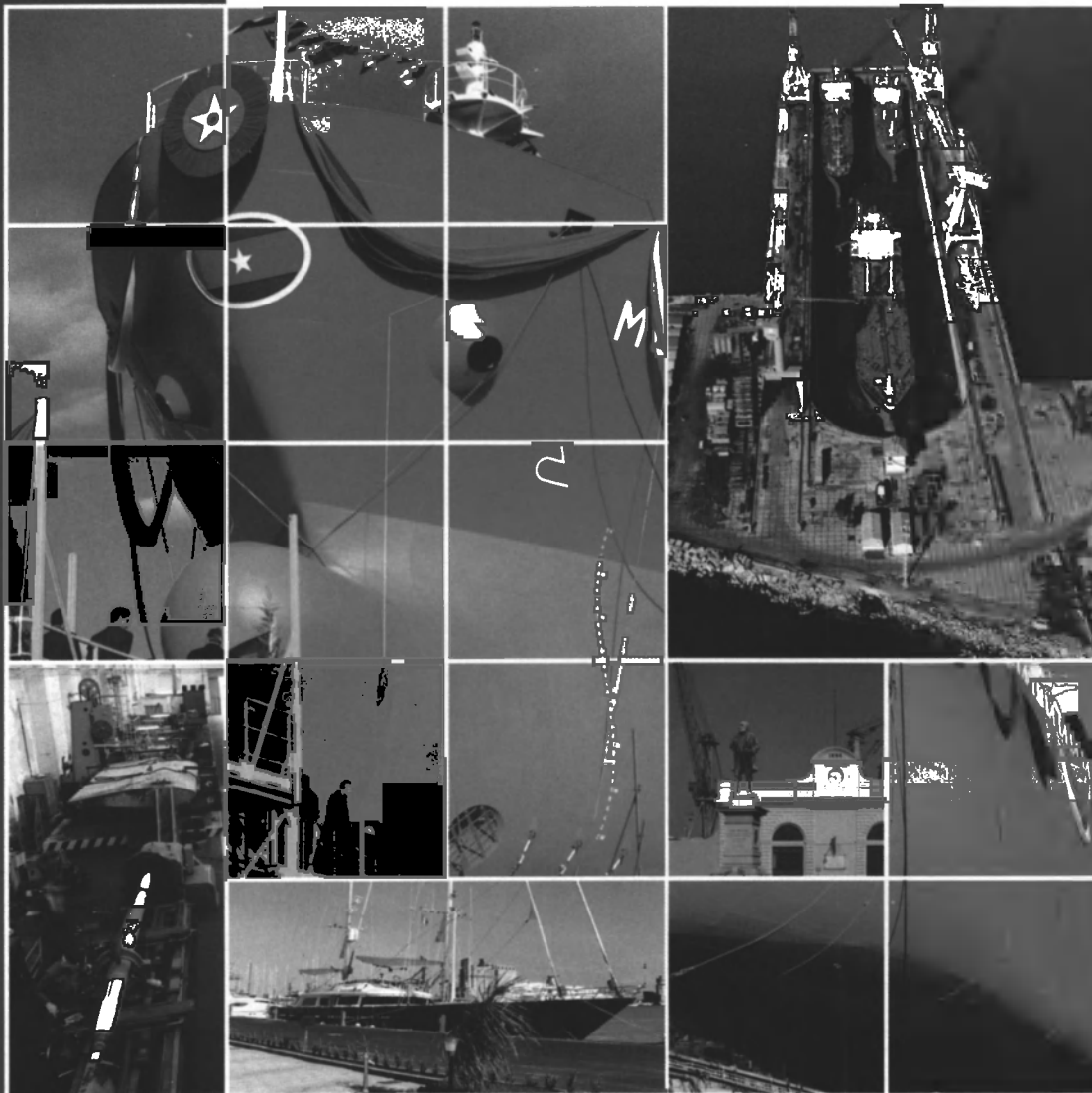
ARSENALE VENEZIA ...

... Buoyant business in private yard

Claiming to be the first Italian repair yard approved by Registro Italiano Navale to ISO 9002 standard, Arsenale Venezia encapsulates the new spirit in the industry following Fincantieri's spin-off of much of its ship repair assets several years ago. The Venetian company, whose facilities had been part of the Fincantieri network up until the early 1990s, has had a good start to 1997, with a pronounced contractual leaning to the international shipowning community, accounting for around 70 percent of work. One plank of the firm's commercial strategy is to build business in the U.S. market, a prestigious reference having been repairs to the U.S. Navy's modern oceanographic research ship *John McDonnell*. Arsenale Venezia operates three dry-docks, enabling it to handle vessels up to 820 ft. (250 m) long and with Panamax beam, with accessibility equivalent to a draft of 33 to 39 ft. (10 to 12 m), depending on the tide.

When recently contacted by *MR/EN*, the company reported a full orderbook. Visitors to the yard this year have included Ukrainian passenger ship *Carina*. The twin-screw, 7,127-gt *Carina* had previously been extensively refurbished at Venice in 1994, and returned in February for further maintenance, repair, and also partial upgrading of passenger spaces.

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Circle 227 on Reader Service Card

two-stroke designs, may well be boosted by production of powerful, Wartsila-designed, medium-speed machinery.

NUOVI CANTIERI APUANIA

Cruise ferry technology, long the province of northern Europeans, has a growing number of active proponents in the Mediterranean. Italian champion of the concept, **Aldo Grimaldi**, has strengthened and revitalized the longer coast-wise and short sea routes, and introduced a quality mini-cruise element, by investing in a new breed of vessel.

Starting with the 32,800-gt *Majestic* in 1993, the class successfully combines a substantial RoRo freight capacity with passenger facilities of cruise ferry standard.

It provides a showcase for Italian interior design, not least for Genoa-based Studio De Jorio, and for builder Nuovi Cantieri Apuania, located against a marble quarry-scoured Apennine backdrop at Marina di Carrara.

Consecutive vessels of the series reflect a continuing design progression, from *Majestic* to near-sister *Splendid* of 1994, on to the larger, and more powerful 35,000-gt *Fantastic* of 1996, and due to be taken a stage further in the 40,000-gt *Excellent*. The latter is scheduled for delivery by Apuania in May 1998, and is 42.6 ft. (13 m) longer than *Fantastic*.

The Grandi Navi Veloci blend of power and speed, and introduction of new quality standards for both passengers and freight, will have a

further reference in spring 1999, in a fifth-of-class ship similar to new-building *Excellent*.

However, the latest addition to the program will be largely constructed in Genoa by Sestri-Cantiere Navale, using blueprints and the first block supplied by Apuania. The assignment of the work to Genoa rather than Marina di Carrara is understood to be linked with Grimaldi's cancellation of a deep sea RoRo contract with Fincantieri, the 100 percent owner of the Sestri yard.

Nuovi Cantieri Apuania has complemented recent years' devotion to the top end of the ferry market with its long-standing presence in specialized tanker building. It recently delivered its largest-ever cargo carrying vessel, the 39,850-

dwt oil and chemical products carrier *Isola Rossa*, the first of two sisters ordered by Rome-based Finaval. The new tanker offers a 43,000-cu-m cargo capacity in 16 compartments fitted with individual deepwell pumps, and employs Wartsila propulsion and power technology including back-up/emergency drive arrangements. The yard also has a 10,000-dwt chem tanker ordered by Castaldi due for completion this year. It earlier built a series of 4,200-gt yacht cruise ships and is now targeting the market for luxury vessels in the 400-800 cabin range.

INMA ...

... Heavier weighting on building new at INMA

Although a name long synony-

FRATELLI ORLANDO . . .

. . . Resurgence of shipbuilding in Livorno

Just 18 months after its sale by Fincantieri to an employees' cooperative, the Livorno shipyard has re-emerged as a force in the industry, attracting the confidence of specialist tanker operators and investing in a switch to the construction of larger vessels.

The re-styling of the enterprise as Cantiere Navale Fratelli Orlando underscores the shipbuilding tradition in the Ligurian port, where the Orlando brothers started the business in 1866. It also signifies the perception of the yard as an integral and essential element of the local economy, in which a broad cross-section of townspeople involved in the building and repair of vessels now have an ownership stake.

For 12 years, the family name had been subsumed into Fincantieri, which had merged the former Cantiere Navale Luigi Orlando into one of its operating divisions in 1984. The years leading up to the spin-off of the yard by the state-owned group had marked a period of uncertainty for the industrial community at Livorno, albeit with a maintained presence in specialized shipbuilding having enabled the retention of key skills.

The yard's operating platform, spanning the more demanding areas of small-ship construction as well as ship repair activities, has been used to full effect by the new, autonomous owning company. The orderbook extends through 1999, and the prospects are such that the enterprise plans to shift newbuilding work to an adjacent, larger berth.

Last month saw the completion of the 14,000-dwt refined oil product and chemical tanker *Montebello*, the first vessel to have been laid down at Livorno since the takeover. The \$32 million newbuilding set the scene for a surge of

business in specialized tanker construction with an estimated, aggregate value of around \$380 million.

The work, all to the account of private Italian owners, is concentrated on tankers in the 9,500 to 14,000-dwt range, most of which have been specified to be equipped with stainless steel throughout the cargo section. But the latest series of contracts signed at the beginning of 1997 also included two combined-role oil/chemical tankers of 36,000 dwt, vessels which give form to the yard's strategy of extending its remit.

The orders for the 36,000-tonners, entailing a class of tanker for which Orlando anticipates significant demand in the coming years, have acted as the catalyst for a project to transfer newbuilding operations within the yard estate to a much larger slip that has lain idle for many years.

Accordingly, work is due to start this September on the rehabilitation and equipping of the 656 x 115-ft. (200 x 35-m) berth in the Morosini Dock, from where a ship was last launched around 30 years ago.

A 360-ton gantry is to be purchased for the facility, which is scheduled to be ready to lay down the first of the 36,000-dwt newbuildings in June 1998. The two lead ships for Finaval and Marnavi, partners in the Novamar tanker pool, embody a design which the Livorno yard has developed to raise its profile in the international market. It is looking to become fully competitive in the handy-size tanker category with yards in the Far East.

The high-volume (45,000-cu-m), full-bodied type embodies 12 cargo tanks and four segregation, horizontal pumps and a deck cargo con-

trol room in the interests of economy, and an 8,000-kW, two-stroke propulsion engine to give a laden speed of 14 knots. The yard has put a price tag of around \$38 million on the class for delivery in the second half of 1999.

By contrast, the intervening and overlapping program of much smaller, sophisticated tankers, most of which will employ Avesta stainless steel throughout the revenue-earning areas, has commanded unit values of \$36-\$40 million.

Despite the current concentration on tanker construction, the company is studying a range of other vessel types through project discussions with a number of European owners. In terms of technical scope for specialized tonnage, the yard's recent experience in diesel-electric propulsion and dynamic-positioning systems is pertinent.

Last year, 70 percent of the yard's business was on the newbuilding side, including the supply of sections to other Italian yards, with the balance of business arising from ship repair and a well-equipped mechanical workshop. The company is looking to maintain a similar ratio in the future.

The new enterprise attaches great importance to ship repair operations, which benefit from a range of facilities including the 300,000-dwt graving dock commissioned in 1975.

In the light of good geographical location relative in relation to market demand, including that generated by U.S. shipping principals, Orlando plans to supplement its repair resources with a floating dock of around 12,000-tons lift capacity. Both secondhand and newbuilding opportunities are reportedly being investigated.



Passenger vessel *Carina* recently stopped in the Arsenale Venezia repair yard for work. The 7,127-gt ship was built in 1977.

mous with technically-demanding ship conversion and rebuild projects, the INMA establishment at La Spezia has fostered a change of emphasis in recent years by devoting more of its resources to the field of special-

ized newbuilding construction.

The result is a 70 percent weighting to shipbuilding, a policy of cooperation with like-minded yards offering complementary skills and capacity, and an ever-more selective approach to conversion and repair work.

The recent refit and modification of French-owned seismic research vessel *Fohn* confirmed the company's skills in reconstruction and engineering-intensive projects. But the building of a series of highly sophisticated, intra-regional chemical tankers underlines its increased commitment to the newbuilding market. This is also expressed in the scheduled arrival at the yard later this year of a Tirrenia RoRo passenger ferry — now approaching the launch stage at nearby Cantiere Navale Ferrari — for outfitting and completion.

The first of three 5,400-cu-m, stainless steel chemical tankers booked at the yard to the account of Stolt Finanzia Marittima is due to be delivered toward the end of 1997, for operation with Stolt Parcel Tankers.

A contract for a fourth vessel is reportedly being negotiated, as the Stolt-Nielsen Group originally expressed interest in a series of six.

The class, conceived for efficient operation and minimum maintenance over a working life of at least 25 years, is distinguished both by a high degree of compartmentalization into 16 stainless tanks, and by the adoption of a diesel-electric power and propulsion system. Employing four Wartsila medium-speed, engine-based gensets developing a total 3,600 kW, the arrangements confer a high degree of operating flexibility and economy through the quickly-changing power load profile characteristic of short sea trading, with its rapidly alternating seagoing, maneuvering and cargo handling modes. Playing to its strengths in another area of specialized tanker construction, the yard also has a fourth example of a versatile class of 7,350-cu-m LPG/ethylene carrier on order for delivery toward the end of 1998.

As a consequence of the collaboration forged with another yard in La Spezia, Cantiere Navale Ferrari, INMA is due to receive the first of two Tirrenia coastal ferries in September for outfitting, in its capacity as project coordinator for



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Fincantieri Delivers New Fast Ferry For Scandinavian Service

Fast ferry MDV 1200 – dubbed *Pegasus Two* – was recently delivered to Ocean Bridge Investments at Fincantieri's Muggiano shipyard. The vessel will be managed by Color Line on the Larvik-Skagen route between Norway and Denmark.

The 312-ft. (95-m) vessel is powered by four MTU 20V 1163TB 73L diesel engines developing a total power of 26,000 kW to provide a maximum speed of more than 37 knots. The fast ferry was constructed with high tensile steel and built according to the IMO High Speed Craft Code (HSC), under classification of Italiano Navale and Germanischer Lloyd.

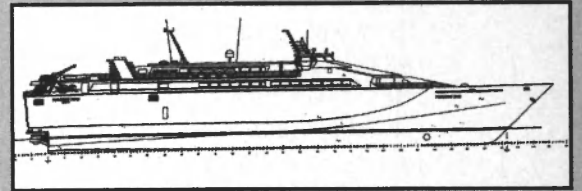
Pegasus Two main particulars

Length	312 ft. (95 m)
Beam	52 ft. (16 m)
Draft	9 ft. (2.7 m)
DWT	400 tons
Service speed	37 knots
Main engines ...	(4) MTU 20V 1163 TB 73 L
Propulsion units ...	(4) KaMeWa 112 waterjets

Pegasus Two is intended to transport 600 passengers and more than 170 cars. Passengers will be accommodated on two decks. Car embarking/disembarking operations will be carried out through

one large stern door on the main car deck, and through three moving ramps which connect the two garage decks.

For more information on Fincantieri
Circle 36 on Reader Service Card



the project. The link-up for the 7,300-dwt class combines Ferrari's steel working strengths with INMA's long-standing skills in outfitting. At 590 ft. (180 m) long overall and 88 ft. (26.8 m) wide, the ferries are substantially in excess of the maximum length of about 459 ft. (140 m.) possible on the INMA building berth, where the traveling gantry imposes a beam limitation of 75.5 ft. (23 m).

Each of the Tirrenia pair will offer 2,000-lane meters of garage deck space for RoRo freight and accommodation for 1,200 passengers. Two Wartsila 12V46 engines delivering a total 25,200 kW are designed to ensure a speed of 23 knots at 90 percent output, to make the vessel competitive on the Naples/Palermo route.

Adaptable INMA is also keen to attract new contracts in the high-speed commercial vessel field, having shown its mettle in the fast-going sector through the production at La Spezia of two 37-knot passenger/vehicle-carrying ferries. Commissioned by Corsica Ferries, the project was executed by way of a joint venture with Rodriquez Engineering, which provided the monohull design knowledge for the 338-ft. (103-m), steel-hulled new-buildings.



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SOCIETA ESERCIZIO CANTIERI, Viareggio ...

... SEC fosters radical change in build system

Ranking as a European leader in the construction of high-technology stainless steel chemical carriers, Societa Esercizio Cantieri (SEC) has raised its game both by taking on substantially larger tankers, and by moving into the

field of advanced RoRo freight ships.

The common link in the two elements of the company's business strategy is the adoption of a production system based on simultaneous construction of sections of each ship at several sites along the Ligurian coast, including Viareggio, from where project control is exercised.

The arrangements, contributing to a self-described 'Copernican' renewal of Italy's largest, privately-owned shipbuilder, have enabled SEC to increase its market scope beyond the previously 14,000 to 15,000 dwt maximum vessel size. No less important, the new system has enhanced its competitiveness in lead times and in execution of multiple-vessel pro-

jects, and is expected to yield benefits in unit cost efficiency.

Thus, the first of the new breed of RoRo trailerships ordered by Swedish operator Stena is being constructed in three main sections at three plants: respectively at Viareggio; at the ORAM yard premises in La Spezia purchased by SEC; and at Genoa, where it is involved in a joint venture with GMG. The aft part of the ship is being built at Viareggio, where a slipway has been demolished to make additional space for the new process.

Joining of the mid-body from La Spezia and forward section from Genoa will take place in a 820 x 131-ft. (250 x 40-m) graving dock in the latter port.

Transportation of sections between the points of production will be effected using two specially adapted, 328 x 131-ft. (100 x 40-m) barges bought by SEC. To increase the company's operating flexibility still further, it has also obtained a site in Livorno harbor.

Delivery of the first of the 12,350-dwt Stena series, offering a trailer laneage of 2,705 m and a service speed of 22 knots, is anticipated in the latter part of 1997.

The step change in production and organization has extended SEC's business potential to double-hulled tankers in the handy-size category, the immediate result of which has been the sealing of two contracts with domestic owners for an advanced new type of 22,500-dwt chem tanker.

The SEC Group, which absorbed the neighboring Benetti yard at Viareggio in 1990, has significant experience in the field, having constructed 32 chem tankers since 1972.

The new 22,500-dwt sisters for Marnavi and Finaval constitute another stage in the development of specialized tanker technology, incorporating aspects of the Greenchem concept developed by SEC in mind of increasing environmental requirements.

One of the key features of the design is the adoption of a diesel-electric installation which will cover all shipboard energy needs including the propulsive power delivery for different operating modes up to a maximum service speed of 16 knots.

A while ago, SEC was disappointed in its hopes of entering the fast

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Drydock 1	90 m	13 m	5 m	3,000
Drydock 2	160 m	20.5 m	7.5 m	20,000
Drydock 3	250 m	32.2 m	10 m	75,000

Berth Characteristics	Length	Max vessel Breadth	Depth	Dwt
Arsenale	300 m	23 m	6.5 m	30,000
Marani	250 m	25 m	7.5 m	90,000



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New Italian Consortium Formed

Snav, Navigazione Libera del Golfo and the Lauro Group have formed the Line Marittime Veloci consortium.

Snav, which is controlled by the Marininvest Group, operates a fleet of 23 craft, including four catamarans and 19 hydrofoils, connecting the Port of Naples and the Campania Islands, as well as routes between the Aeolian Islands and in the Straits of Mesina. Snav reported a passenger flow of approximately two million in 1996.

Navigazione Libera del Golfo is a

50/50 joint venture of Aponte and the Savarese family. The company operates mainly in the Gulf of

Naples, with a fleet of five motorships and five high-speed craft. Navigazione reportedly transported 1.5 million passengers in 1996.

The Lauro Group's fleet consists of hydrofoils, catamarans, high-

speed monohulls, ferries and traditional vessels, with a total of 30 craft in service year-round. In 1996, the group reportedly transported more than three million passengers on both tourist and commuter routes.

ferry domain by way of a Tirrenia project for a stern-ramped, 305-ft. (93-m) vessel based on the SES (surface effect ship) concept. Nonetheless, it is continuing to explore possibilities and opportunities in the high-speed sector, in line with its traditional concentration on the more specialized and higher added-value areas of the business.

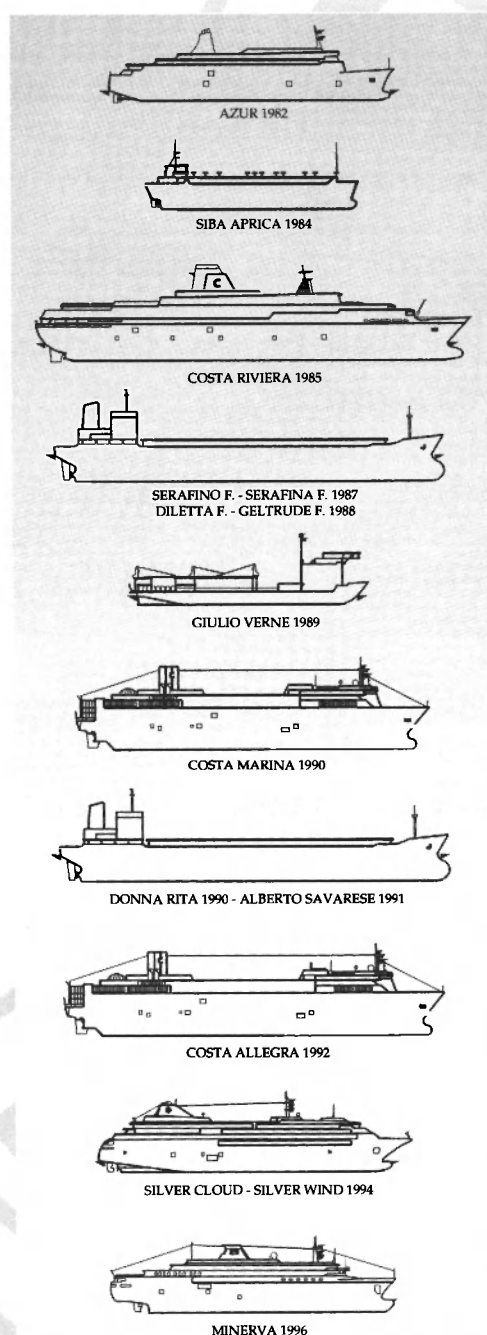
Fincantieri Delivers SuperSeaCat Two

SuperSeaCat Two, which was profiled in *MR/EN's* June 1997 issue, recently left Fincantieri's Muggiano Yard for delivery to owner SeacContainers, Ltd. Both *SuperSeaCat Two* and its predecessor *SuperSeaCat One* reportedly obtained excellent results for speed, maneuverability, course keeping and seakeeping during sea trials.

The contract for both vessels was signed in November 1995 in conjunction with the construction of a series of new monohull, light-alloy, fast ferries to be built in Italy. The two *SuperSeaCats* measure 328 ft. (100 m) long and each carry approximately 800 passengers and 175 cars, and are managed by a crew of 26.

For more information on Fincantieri
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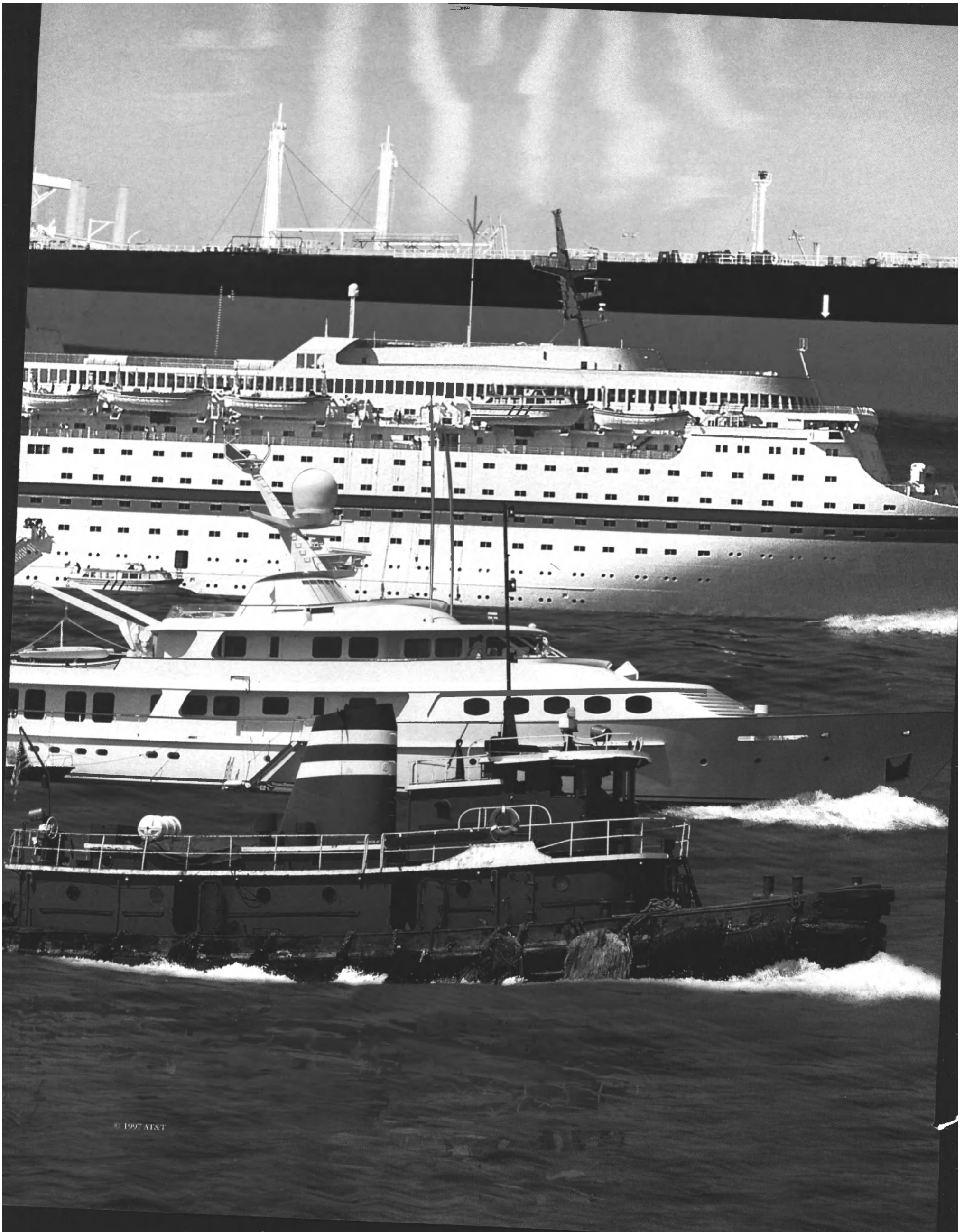
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AT&T Just Put Mobile Satellite Services On An Even Keel

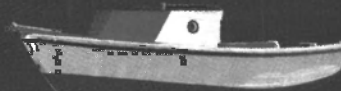
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MSC Puts New Flagship To Sea

The new flagship of Mediterranean Shipping Cruises (MSC Cruises), the cruise branch of the Mediterranean Shipping

Company Group (MSC Group) recently left Genoa for a seven-day cruise in the Mediterranean.

Built in 1982, *Melody*, which

MSC purchased last January from Premier Cruise Line for \$70 million, measures 672 ft. (205 m). The vessel can reportedly accommodate 1,600 passengers. The vessel joins the MSC existing fleet of cruise ships

Monterey, *Rhapsody* and *Symphony*.

"With the purchase of *Melody*, MSC Cruises confirms its positive trend, as the company in 1997

has increased both fleet and turnover," said **Nicola Coccia**, chairman of MSC Cruises in Naples.



MSC Chairman
Dr. N. Coccia

GENOA CRUISE



GENOA: ITALY'S MAIN CRUISE TERMINAL.

In only a few years, Genoa has become one of the cruise capitals of the Mediterranean, with a throughput of over 400,000 passengers transiting into its Cruise Terminal, operated by "Stazione Marittima Porto di Genova S.p.A.", that is considered one of the most efficient, safe and functional structures all over Europe. Genoa's Cruise Terminal geographic position offers its ferry passengers excellent opportunities to discover the city and its surroundings.

HISTORY

Genoa is Italy's main port. It has been, as historian Braudel said, "a world within a city", a financial and commercial capital, like Amsterdam or New York. Its cultural past is kept alive through the museums and 16th & 17th century aristocratic palaces.

LANDSCAPE

With Cinque Terre, its Rivas and Portofino, you'll never be tired of Genoa, a unique landscape, rising up from the green Appennines down to the sea.



Stazione Marittima Porto di Genova s.p.a.

Genoa's Passenger Port Information

Access harbour	24 hours service
Mooring for cruise vessels	
Length up to:	300 mt
Width:	no limits
Draught up to:	11 mt
Volume:	no limits
Mooring location for cruise vessels	
Berthing places:	5
Overall length:	1,260 mt
Depth up to:	11 mt
Passenger terminals:	2
Roasted mooring:	available
Shuttle boats for ship/harbour connection	available
Terminal mooring:	available
Mooring time allowed (*):	12 hours
Additional time for ship approach:	30 min
Compulsory pilotage:	for ships exceeding 500 GT
Mooring services:	available
Available tugboats:	30
Tide range:	30/40 cm
Services	
Ship repairs, Barges for refuelling,	
Garbage collection, Water supply,	
Various supplies, Bank, Garage	
Location	
44° 24' 15" N - 8° 54' 20" E	
City centre:	1 km
Airport:	5 km
Railway station:	500 mt
Transport Bus, Tube, Taxi, Private bus service	

(*): Longer periods allowed upon prior programming when moored.

Melody specifications

Length	672 ft. (205 m)
Breadth	90 ft. (27.43 m)
Engines	diesel 22,070 kW
Speed	.21 knots
Gross tonnage	36.5
Passenger capacity	1,600

(Continued from page 40)

Company Profile: Uniservice

Singapore, Turkey, Israel, Denmark, Belgium and Greece. Today, Uniservice maintains service network capability in more than 700 ports worldwide.

Uniservice's product line includes a full range of water treatment, maintenance, tank cleaning, fuel treatment, sanitation treatments, and environmental and specialty products. Its boiler water treatment program is comprised of three separate and distinct concepts: one shot treatment; standard treatment; and organic treatments. The company's cooling water treatments reportedly carry approvals from leading engine manufacturers and offer effective protection within vessel engine internals. The company's Unitrend is a program which enables vessels to log test results and create long-term data utilizing both graphs and numerical information.

For more information on
Uniservice

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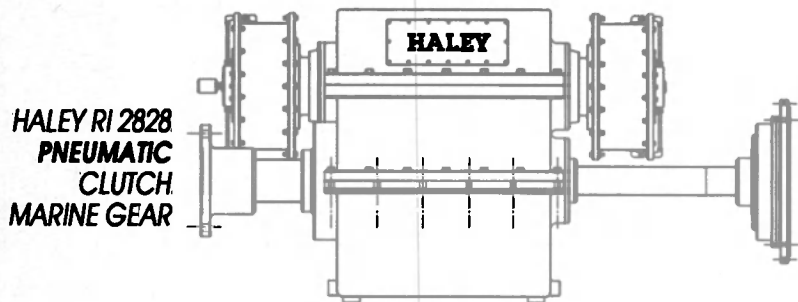


The Livorno (Leghorn) Shipyard

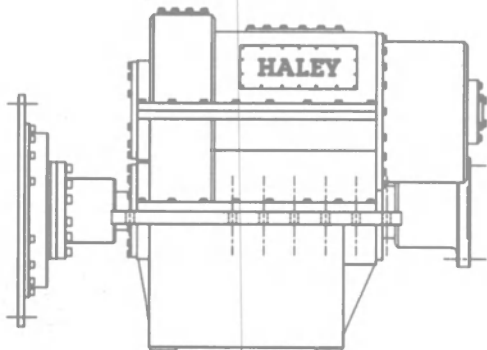
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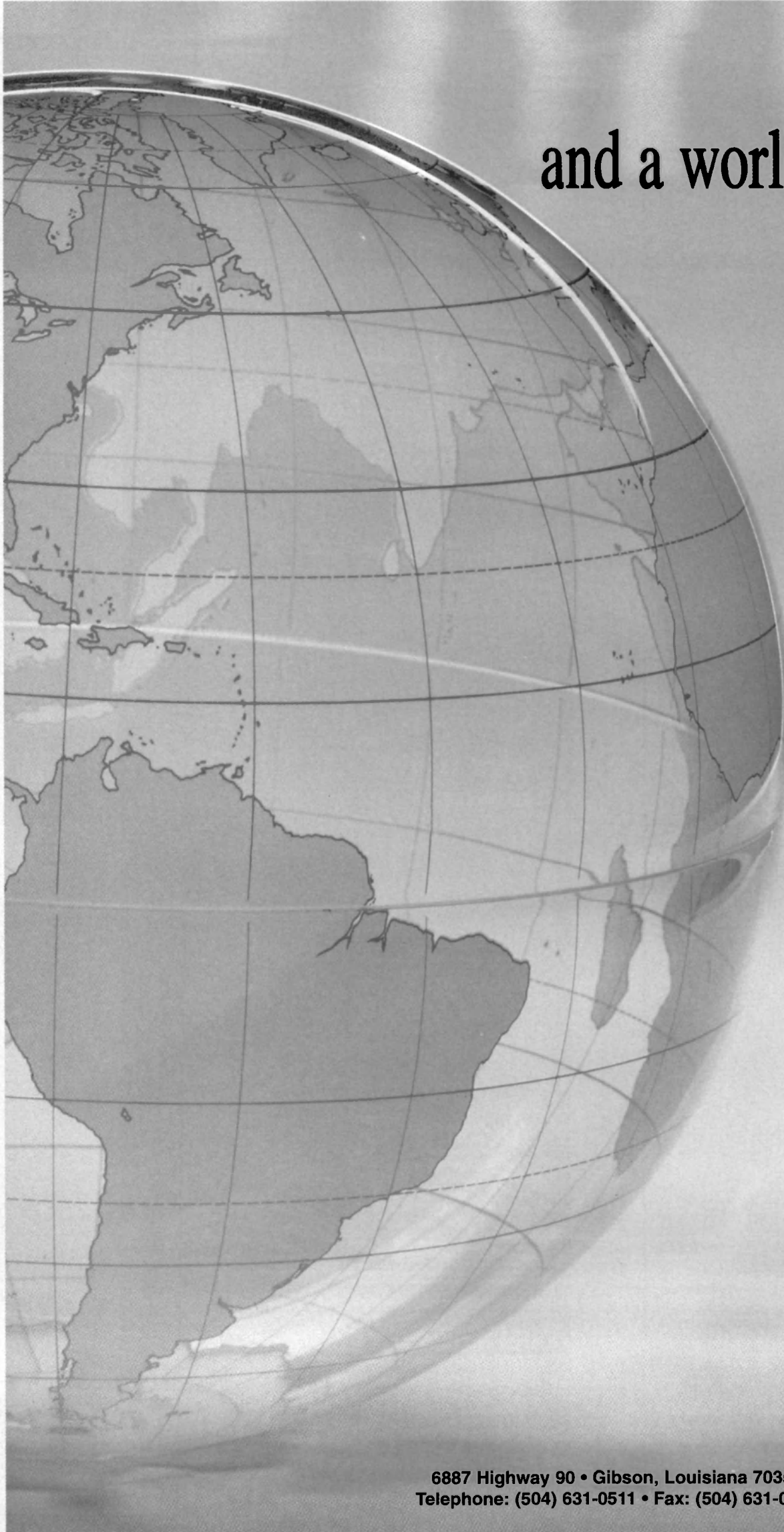
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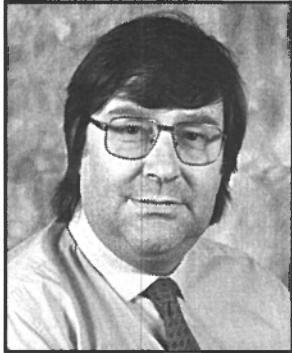
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Circle 30C on Reader Service Card

FPSO And Cruise Ship Work Dominate Repair Market

by Alan Thorpe, international editor

Following lengthy discussions, Norwegian Cruise Line (NCL) has finally obtained the necessary financial backing to move forward with contracting the lengthening of 39,217-grt cruise vessels *Windward* and *Dreamward* at



Bremerhaven's Lloyd Werft. The financing for the project, believed to be worth in the region of \$107 million, has been arranged with various German banks, KfW in Frankfurt being the leading institution.

Both ships will be lengthened by the addition of a 131.2-ft. (40-m) midbody section. *Windward* is due in the yard on January 13 of next year, staying to March 15, and *Dreamward* is scheduled to arrive on March 11 and sail on May 10. Each vessel will have a new total length of 754.5 ft. (230 m) and the project will increase passenger capacity from 1,500 to 2,000. Both ships were built by French yard Chantiers de l'Atlantique during 1991/92. The first midbody section was started at Lloyd Werft during April.

The first stage of the refit of cruise vessel *Sagarose*, formerly Cunard's *Gripsholm*, was completed by A&P Southampton on May 13 when the vessel left for a three-day shake-down cruise prior to loading its first passengers in Southampton on May 19. The cruise ship is due to return to A&P on October 21 for the remainder of an eight-week refit. The main

outfitting contract for this ship has gone to Southampton-based CLC Marine.

Another U.K. yard involved in passenger vessel refits is Belfast's Harland & Wolff (H&W), which has recently been awarded the conversion contract for 63,524-grt P&O cruise vessel, *Arcadia*, ex-*Star Princess*, which is due in the yard in November. This will be the first ship undertaken with H&W's new partnership with outfitting specialist Mivan Marine Ltd. When completed, *Arcadia* will take over the sailing schedule from P&O's former flagship *Canberra*, which is being retired from service.

Dubai Drydocks has won a contract from BP Shipping for the first docking of a series of four large LNG carriers owned by Abu Dhabi National Gas Co., built by Japan's Mitsui Shipbuilding & Engineering (two ships), Mitsubishi Heavy Industries (one ship) and Kawasaki Heavy Industries (one ship), and managed by BP Shipping. The 71,931-dwt, Liberian-registered ships are: 1994-built *Al Khaznah*, which is due on May 10; 1995-built *Ghasha*; 1994-built *Shahamah*; and 1995-built *Ish*. There are another four sisterships in this fleet, all built by Kvaerner Masa-Yards, managed by Gotaas-Larsen and due for similar dry-docking operations next year.

Following Bahrain-based Arab Shipbuilding & Repair Yard's (ASRY's) record year for ship repair revenues in 1996, the yard has announced a 20 percent increase in revenue for the first quarter of this year. This good start has been helped by an increase in the average value of repairs per vessel and two shuttle tanker conversions. The most significant projects carried out during this time involved the conversion of 131,584-dwt Petrobras tanker *Jurupema* and 140,905-dwt Red Band tanker *Knock Taggart* into FSO vessels.

The latest projects at the yard involve 133,752-dwt, Petrobras-owned ore/oil carriers *Mafra* and *Marau*. The main work includes installation of bow loading systems, manufactured by Hitech Marine in compliance with the requirements of Lloyd's Register (LR). Other work involves relocation of mooring

Marau is depicted leaving ASRY's graving dock.



Sagarose at A&P Southampton.

systems; forward main deck structural work; blasting and painting; installation of watch cabins, stowing tanks, air-cooler compartments, cargo and fire pipes on forward main decks; installation of hydraulic systems and pipes; and alteration of main switchboards.

A major FPSO refit contract has gone to Portugal's Lisnave, the first such contract won by the yard. The project, which involves in excess of 900 tons of steel renewal, involves 79,313-dwt, Liberian-registered FPSO *Ocean Producer*, which is owned by U.S. company Oceaneering Inc. and located in the Kiabo field off the Angolan coast (West Africa). The unit was due to arrive in the yard during early June and was expected to stay for two and a half months. The vessel was formerly tanker *Amoco Baltimore*, converted for FPSO duties years ago.

Chile's Asmar Shipbuilding & Docking Co. recently won a contract with an estimated value of \$3.5 to 4 million from U.K.-based Furness Withy to carry out repairs on 47,000-dwt Bermudan LPG storage vessel *Darwin*, which has been anchored off Guayaquil, Ecuador, since September 1992 on a contract with PetroEcuador, the state-owned oil and gas company. The vessel was to arrive in Asmar's Talcahuana yard during early June and to stay in the yard for approximately five weeks. *Darwin* is the former BP Shipping-managed *Gaz Enterprise*.

It was interesting to learn from Furness Withy that U.S. West Coast repair yards had refused to quote due to the complexity and volume of the repair work required, and that deviation costs to take the ship to a yard across the Pacific Ocean to Southeast Asia left the owner with little choice but to use a yard located on South America's West Coast.

Turkey's Tuzla Shipyard & Tourism Co., Istanbul, owned by Kahraman Sadikoglu, has recently been involved in two major conversion projects. FPSO *Frenze* left the yard in January after a year-long conversion from a convention-



SHIP REPAIR & CONVERSION

al tanker was completed. The vessel is now reportedly at Saipem's Sardinia shipyard for the installation of offshore modules. During early May, offshore semi-submersible drilling rig *Scarabeo 7* arrived at the yard to be converted, under a \$54 million contract, from

an accommodation rig to a drilling rig. The project involves 680 tons of steel work to increase the unit's number of legs from six to eight, over the next 14 months.

The yard has also purchased a 1,082.6 ft. (330 m) long concrete floating dock which has been in

Genoa since the 1970s. The yard is currently working in cooperation with the Italian Registry (RINA) to get the dock seaworthy for a tow to Turkey, which was expected to begin in June. It has been projected that the dock will be fully operational by the end of the year.

What is believed to be the first lengthening contract ever carried out in a mainland Chinese shipyard is currently underway at Qingdao Behai Shipyard, part of China State Shipbuilding Corp. (CSSC).

The vessel involved is the 4,007-dwt, 1984-built general cargo vessel *China Seaways*, owned by South Korea's Resource Trading. The project involves 1,200 tons of steel and installation of three new cargo tanks weighing 290 tons, 167 tons and 135 tons, respectively.

The ship will be lengthened by the insertion of a 57.3-ft. (17.5-m) midbody section and converted into a specialized asphalt carrier. *China Seaways* reportedly arrived at the yard in March and was expected to leave in June.

During the latter part of 1996, the yard took delivery from its own shipbuilding section of a 100,000-dwt capacity floating dock, measuring 755.8 x 147.6 x 59-ft. (230.4 x 45 x 18-m), with a lifting capacity of 28,000 tons.

Since then, the yard has reportedly docked 26 ships in the new facility. Apart from the new floating dock, the yard operates two graving docks, with the largest accommodating ships up to 37,500 dwt.

Rotterdam-based ship repair company Niehuis & van den Berg is set to extend its market potential by purchasing a larger floating dock.

Expected to be operational this month, the dock will raise the company's ship size capability by an extra 25,000 tons of lifting capacity. Just as important, it will increase the Dutch company's scope by facilitating vessel widths of 104.3 ft. (31.8 m), compared with the current 82 ft. (25 m) limitation.

The floating dock has been purchased from Hamburg, Germany's Blohm + Voss AG for an undisclosed sum.

U.K.'s Cammell Laird has announced that it intends to seek a listing for its shares on the London Stock Exchange by way of an institutional placing this summer.

"We believe that flotation will offer Cammell Laird significant benefits as it enters its next phase of development, particularly as the yard's additional drydock capacity comes on stream later in the current year. We intend to expand the Technical Services department and plan additional expenditure

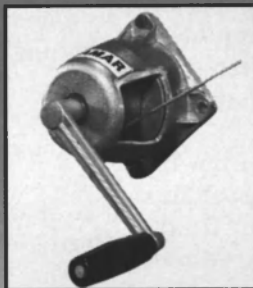
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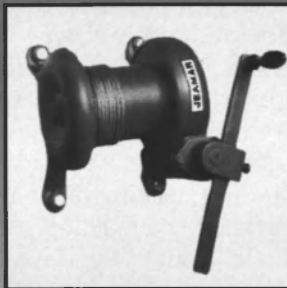


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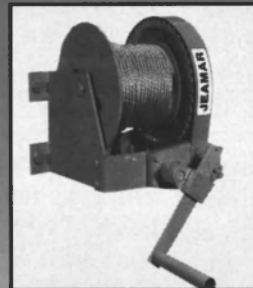
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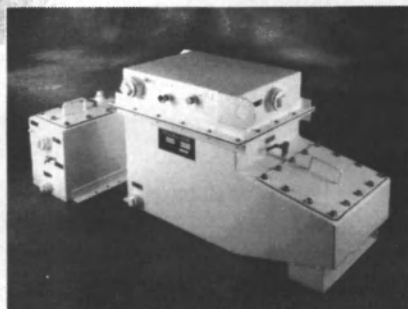
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Maritime Reporter/Engineering News

on the site to enhance both the scope and productivity of our service," said yard Chief Executive **John Stafford**.

Meanwhile, during March the yard began the renovation of the two non-operable drydocks. The renovation of these docks is expected to be completed in the last quarter of 1997, and when completed, will triple the number of drydocks available for use. More than 300 tons of steel work has reportedly been fabricated for the entrance gates at the No. 6 and No. 7 drydocks and the related minor work is nearing completion. Civil work is due to start in the No. 6 drydock shortly, while dredging operations in the No. 7 drydock continue, with 20,000-cu-m already removed from the docks and channels.

Thruster Production Commences At Harbormaster

Harbormaster Marine Inc. has begun a production run of Model BT-200 thrusters, along with specific application production of other thruster and Z-drive models. The BT-200, designed for vessels less than 150 ft. (48 m) in length, uses a 36-in., four-blade propeller turning at 643 rpm, propelled by diesel hydraulic or electric power of 150 to 200 hp at 1,800 to 2,000 rpm.

Larger thruster models — such as the BT-340 for vessels 160 ft. (49 m) long and the BT-400 for vessels 180 to 185 ft. (54.8 to 56.4 m) long — will begin production later this year.

For more information on Harbormaster
Circle 16 on Reader Service Card

ABS And USCG Encourage Alternate Compliance Program Enrollment

Following a successful two-year pilot program, the U.S. Coast Guard (USCG) and the American Bureau of Shipping (ABS) have agreed to formally open enrollment in the Alternate Compliance Program (ACP) for internationally trading U.S.-flagged ships, effective August 1.

Under the terms of the program, ABS surveyors will be empowered to act as USCG agents by issuing

relevant documents to support the issuance of full-term USCG certificates of inspection (COIs).

ABS will undertake necessary surveys and inspections, and issue the international certificates, while the USCG will continue to issue final COIs.

"The last two years have been the culminations of several years

of work by ABS and the USCG to streamline Coast Guard inspection activities while maintaining adherence to our common missions of protecting life and property at sea," said **Robert Vienneau**, Special Projects manager for ABS Americas. "A great deal of unnecessary duplication has been eliminated, resulting in significant cost

savings for shipowners with no reduction in the level of safety standards which continue to be applied to their vessels."

For U.S. flag owners, a significant benefit is the harmonization of USCG requirements with international convention standards, particularly those contained within SOLAS and MARPOL rules.



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A corrective action matrix is maintained to ensure that areas of concern or duplication are addressed within regulatory reform processes, the ABS Rules Development Committees and IMO.

In preparation for the formal roll-out of the program, ABS and the USCG are running a series of

training and familiarization courses for ABS surveyors at the Coast Guard Reserve Training Center in Yorktown, Va.

This follows earlier indoctrination training programs conducted in Yokohama, Singapore, London, Rotterdam, USCG headquarters and all major offices of ABS and the USCG in the U.S.

Turbinservice Offers Soot Cleaning System

Turbinservice International Ltd. has released Ventax, an automated infrasonic soot cleaning system which uses vibrating air waves to break down accumulated soot and dust deposits in boilers, economiz-



ers and incinerators into particles light enough to be released into the atmosphere via exhaust gases. This reportedly eliminates the need to wash equipment with water or steam, which produces sulphuric acid and therefore, pollution and corrosion.

The system has been developed for oceangoing vessels where soot fires in exhaust gas-fired boilers and economizers are a continuing problem.

For more information on Turbinservice
Circle 23 on Reader Service Card

MMC Offers Self-Contained Sampling Tape

MMC International has released a portable, electronic instrument which attaches to existing tank valves to extract samples from shipboard tanks. This closed, self-contained sampling tape features a unique built-in flow control valve that diverts the sample into a sealable bottle.

A return hose from the bottle to the tape housing prevents vapors from escaping, keeping the operator in observance of environmental and safety regulations. MMC also produces portable electronic gauging tapes, valves, C-L couplings and other specialty products for the marine and petrochemical industries.

For more information on MMC
Circle 24 on Reader Service Card

Kvaerner Delivers Fourth LNG Carrier For ADNOC

Kvaerner Masa-Yards recently delivered its fourth 135,000-sq-m LNG carrier, dubbed *Umm Al Ashtan*, to owner Abu Dhabi

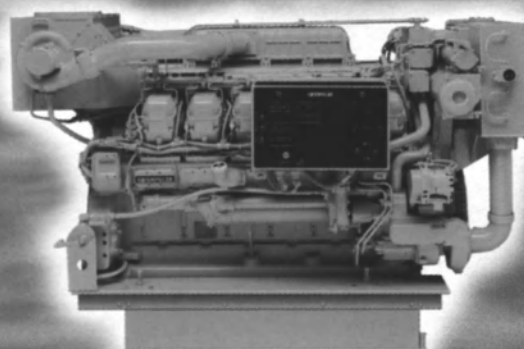
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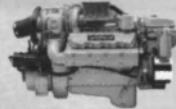
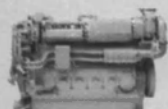
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Circle 325 on Reader Service Card

National Oil Company (ADNOC), of the United Arab Emirates.

The vessel is reportedly one of the largest LNG carriers in the world, and is the last in an order of four ships placed in April 1993.

The first vessel, *Mubaraz*, was delivered in January 1996, followed by the second ship, *Mraweh*, in June 1996, and third vessel, *Al Hamra*, which was delivered in January of this year. The ships have reportedly been successfully engaged in transporting LNG from Abu Dhabi Gas Liquefaction Company to Tokyo Electric Power Company in Japan. They are operated by National Gas Shipping Company (NGSCO).

For more information on
Kvaerner Masa-Yards
Circle 17 on Reader Service Card

Damen To Deliver New Tug



Damen Stan Tug 1405, *Teign*, was scheduled to be handed over last month to owner Teignmouth Harbour Commission of Devon, England, after successful sea trials.

The new vessel will be operated by Bartlett Bros., a trading division of Teignmouth shipping agent Pike Ward Ltd., and will be used in the Teignmouth area for plough dredging, berth leveling, pilotage and general workboat services.

Teign is reportedly capable of achieving an eight-ton bollard pull from a continuous output of 600 bhp, reaching a free sailing speed of 9.5 knots.

Deck equipment includes a towing bitt and hook with a safe working load (swl) of 12 tons with quick release.

In addition to a 3.5-ton swl hydraulic winch, the vessel has a 3.5 tons swl hydraulically controlled A-frame, which can be lowered to fit flush on the aft deck.

The new Damen tug has a 10-mm steel hull plating and an integrated sheerstrake with a thickness of 20 mm.

The hull has been subdivided by watertight bulkheads into a forepeak compartment, store or sleeping compartment with toilet facilities, fuel tanks, engine room and an after-peak section containing steering gear equipment. The wheelhouse contains an instrument panel with engine controls and alarms, rudder indicator, pow-

ered hydraulic steering, search light, safety lamp, horn, radar with 36-nm range, magnetic Kotter compass, DGPS system linked to an echosounder for survey operations, and fixed and mobile VHF units.

For more information on
Damen Shipyards
Circle 21 on Reader Service Card

Teign specifications

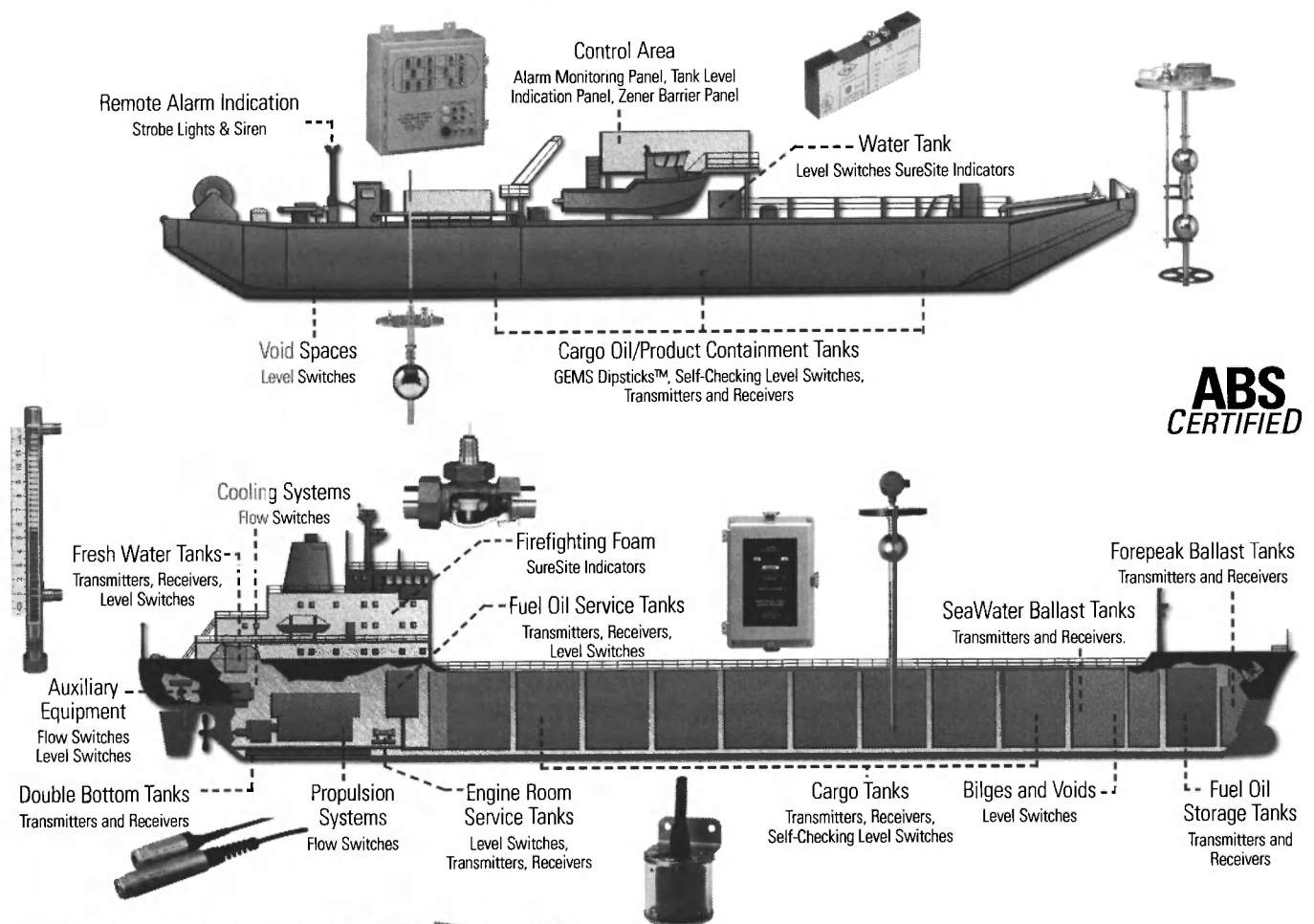
Length, o.a.47.2 ft. (14.4 m)
Breadth, o.a.15.5 ft. (4.73 m)
Depth6.7 ft. (2.1 m)
Tonnage35 gt
Speed9.5 knots

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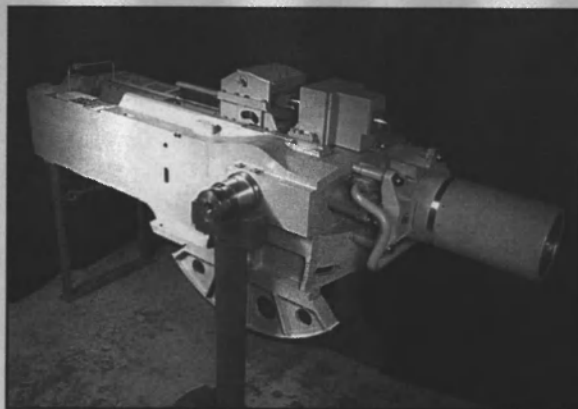


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United Defense Delivers Weapons To U.S. Navy

United Defense LP has delivered the Mk45 naval gun proof-of-concept (POC) firing assembly to the Naval Surface Weapons Center, Dahlgren, Va. The POC assembly will undergo tests this summer to validate the Mk 45's future capa-



Pictured on the left is an assembly of the Mk 45 Mod 4, containing the gun barrel housing, breechblock, slide and recoil system.

On the right, an artist's rendition of the Mk45 Mod 4 naval gun.



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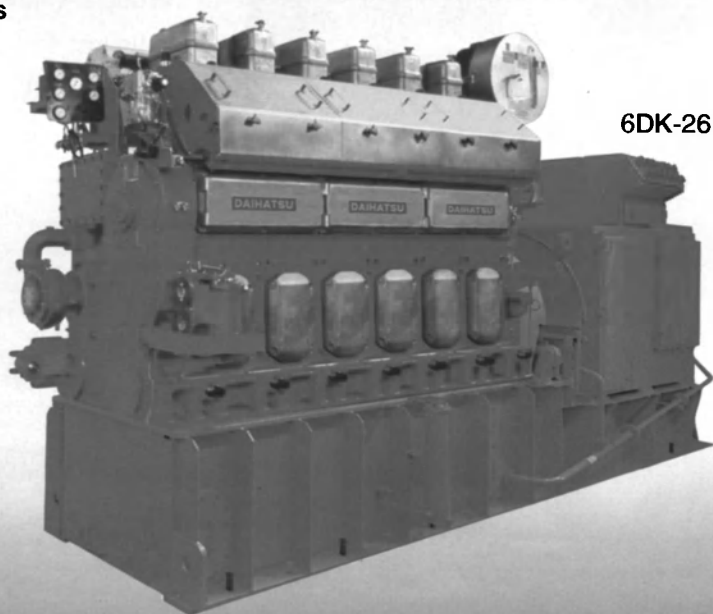
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bility to fire an extended range guided munition (ERGM) up to 63 miles. The assembly contains the newly designed Mk 45 Mod 4 gun barrel and housing, breechblock, slide and recoil system. Plans call for the Mk 45 Mod 4 to be introduced to the fleet in the year 2000 on the U.S. Navy DDG 51 destroyers, which could entail a forward fit of 18 to 24 gunmounts to new ships of this class. Mk 45 Mods 0-2 are reportedly in service with the U.S. Navy and in the fleets of Australia, Greece, New Zealand, Thailand and Turkey.

For more information on United Defense
Circle 15 on Reader Service Card

Japanese Shipbuilders Boost Capacity

Japan's Kawasaki Heavy Industries plans to resume operating one of the shipbuilding slipways at its Kobe plant as early as next summer of next year. In the meantime, Ishikawajima-Harima Heavy Industries also plans to boost production capacity at its Tokyo plant to 26,500 tons from 25,500 tons.

Kvaerner Yards Win Tug/Ferry Contracts

Kvaerner ASA's Kvaerner Klevin subsidiary won a contract for an anchor handling and tug vessel worth \$23 million from Japan's Sanko Steamship Co. The vessel is expected to be delivered in May 1999.

In addition, Kvaerner Fjellstrand won a contract to build a high-speed passenger and car ferry catamaran for Express Ferries Ltd.

The 196.8-ft. (60-m) JumboCat is due for delivery in April 1998. The aluminum vessel will carry up to 430 passengers and 52 cars. The contract includes an option for a second vessel for delivery in spring 1999.

Oslo Again Proves To Be Hot Spot For Maritime Innovation

Nor-Shipping, held every two years in Oslo, continues to grow in importance and is regarded as one of the international maritime industry's premier events. This year's show featured 20 national pavilions, with groups of companies from the U.S. to Norway to Japan gathering together to exhibit their wares. The exhibition, as always, was used as a launching spot for a number of new products and services by some of the industry's leading companies. The following is a quick-read guide of new products and services announced in Oslo — as well as significant news — for those who were unable to attend the event. For additional information, please circle the appropriate number on the Reader Service Card in this issue.

Ed Waryas, **Newport News Shipbuilding's** director of Marketing for Commercial Ship Construction and Repair told *MR/EN* that the yard has been



Ed Waryas of Newport News Shipbuilding announced new contracts at Nor-Shipping.

awarded a contract for work on five ships operated by Maersk Lines Ltd. The work performed will include drydocking, maintenance and repair of the five U.S.-flagged RoRo vessels dedicated to the U.S. Marine Corps' Maritime Pre-positioning Ship Program, and include

M/V 1st Lt. Alex Bonnyman, M/V Cpl. Louis J. Hauge, Jr., M/V Pfc. William B. Baugh, M/V Pvt. Franklin J. Phillips, and M/V Pfc. James Anderson, Jr.

"We are very pleased to be working once again with such a respected shipping company as Maersk," said Mr. Waryas.

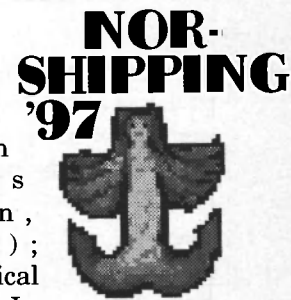
The first ship was scheduled to arrive in mid-June, and work on all five is scheduled to be completed by the beginning of 1998.

A new consortium serving navigation and software needs was also announced at Nor-Shipping. **United Software Distributors (USD)** is a strategic alliance of five international chart distributors, together with a marine software company, that will provide the international maritime community with electronic charts and related software. The six companies will not only supply and provide updates for electronic charts, but **July, 1997**

in addition, the Microplot software will display and add a multitude of features to electronic charts. USD sees Microplot as an extremely user-friendly product, whose popularity justifies the six companies

endorsement of the product to their customers. Currently, there are more than 400 permanent installations of the program. The six companies in the new consortium include: Thomas Gunn

Navigation Services (Aberdeen, Scotland); Maryland Nautical Sales Inc.



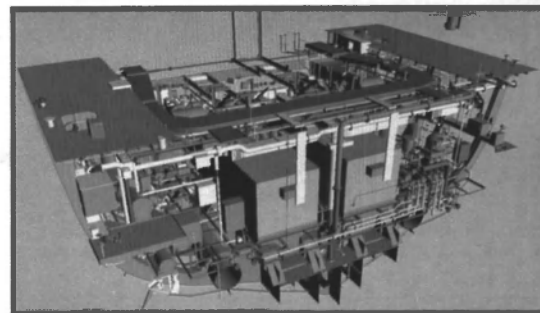
TRIBON Vitesse

TRIBON Vitesse creates a new era in ship design — the Rule-based Automated Design era.

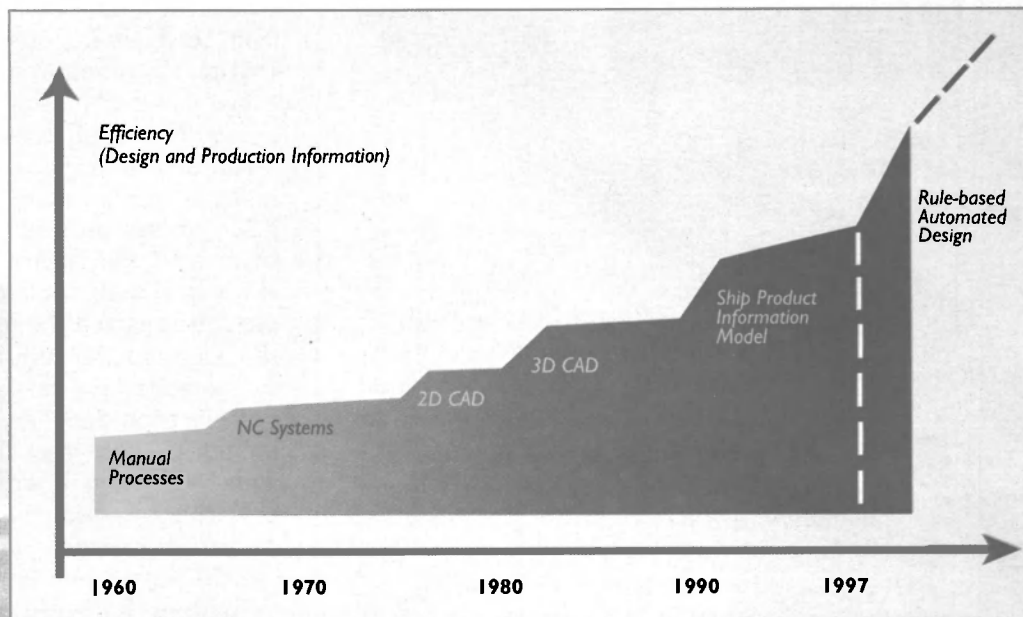
TRIBON Vitesse will enable the user to write his own Vitesse programs to control design development according to his own rules with direct access to the TRIBON Product Information Model and all the functionality of the TRIBON applications.

TRIBON Vitesse has been developed in close co-operation between KCS and the French shipyard Chantiers de l'Atlantique in St. Nazaire. Vitesse is a French word meaning speed.

TRIBON Vitesse will lead to a step change in ship design efficiency through rule-based automated design for different types of structural arrangements and outfit layouts. TRIBON Vitesse can be applied from the smallest design standard right up to major sections of ships.



The TRIBON Shipbuilding system covers all aspects of design from initial design to production, including advanced features from the assembly phase of ship production and materials control. Design and information systems from KCS are installed at more than 260 sites in 38 countries in Asia, Australia, Europe, North and South America.



New feature in TRIBON 4

During 1996 a total of 422 ships were delivered which were built using the TRIBON system.



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Please send me further information about TRIBON Vitesse

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Circle 272 on Reader Service Card

Nor-Shipping '97 News

For more information on the companies mentioned in this story, please circle the appropriate number on the Reader Service Card in this issue.

Company	RSC#
IAQS	5
MacGregor	6
Newport News Shipbuilding	7
Odim A.S.	8
Saab Marine Electronics	9
Telia Mobile	10
United Software Distributors	11

(Baltimore, Md.); Motion Smith (Singapore); Navicharts AS (Oslo); Safe Navigation Inc. (Long Beach, Calif.) Sea Information Systems (Aberdeen, Scotland.)

USD believes it is on the cutting edge of marine technology, as it contends that over the next few

years, paper charts will disappear and will be replaced by electronic charts, displayed by ECDIS systems which are usually based on an Intel chip, the heart of a standard PC. USD said the Microplot system is designed to accept both raster and vector charts, and is compatible with the chart formats of ARCS, Livechart and NOAA.

Another consortium of companies was introduced to help shipowners come into compliance with the International Safety Management (ISM) Code, which is to take effect in July 1998. It is estimated that more than 6,500 companies and 19,000 vessels around the world are not currently in compliance with the new regulation, and international authorities continue to warn shipowners that there will be consequences for those vessels and owners who chose to delay the

process. The new association, **International Association of Quality Surveyors (IAQS)**, seeks to help hundreds of shipowners from having their vessels banned from leading ports. IAQS is a group including **ECM/Hudson, MARCARE and Murray Fenton and Associates.**

The ISM Code stipulates that all oil and chemical tankers, gas carriers, bulk cargo ships and passenger ships must adhere to the regulation by July 1, 1998. All owners of cargo ships over 500 grt are required to comply with the Code by July 1, 2002. "Our aim is to combine the resources to provide worldwide consultancy and smooth the path for shipowners seeking accreditation for the ISM Code," said John Noble, Murray Fenton's managing director. "To date, only a small percentage of the world's tonnage is certified."

In noting the seemingly uniform resistance to the ISM code, ECM/Hudson's Per Christensen said that, in general, the shipping industry is very conservative and resists change, as many companies feel that its qualities and systems are sufficient. However, the overwhelming message from the IAQS group is "you can't avoid ISM."

Seeking to garner more business from the booming offshore market, **Odim AS** announced its new offshore mooring and offloading concept at Nor-Shipping.

The new concept is designed for installation onboard FPSO and FSU units, and is designed to transfer crude oil from production ships to shuttle tankers. Two people can reportedly handle the system in a simple, safe manner. All components are installed on the vessel's poop deck, and equipment includes: hose reel in frame/catwalk, pre-rigged with hydraulic powerpack and cable drum; control cabin for mooring/offloading; winch with messenger line to offloading hose, hoisting power and braking power of one ton; 600-ton hawser winch, with a hoisting power of five tons; a hydraulic powerpack for hawser winch, messenger line winch and service crane; battery charger; junction box and hydraulic valve blocks; and oil heater.

Telia Mobile announced the introduction of a new e-mail services in MARITEX, with gateways to users of cc:mail, internet mail and X.400 mail. The move is designed to improve the communications capabilities between ship

and shore, extending the scope of MARITEX services in line with increased flexibility demands. MARITEX is a computerized, global network for maritime text communications owned and operated by Telia Mobile.

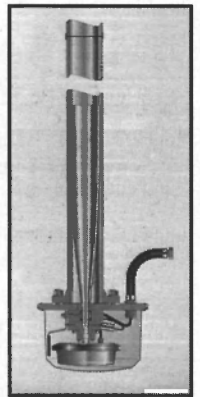
Saab Marine Electronics now offers its popular

TankRadar for liquefied gas carriers. The unit not only measures level, but also tank pressure, vapor and liquid temperature, as well as trim and list. The new radar gauge is a further refinement of the Saab TankRadar G3 system. The new system has no moving parts, is intrinsically safe and has only its stainless steel cone antenna in the tank vapor. The still pipe directs the microwaves so that the gauge can measure reliably, even when liquefied gas is boiling.

United Arab Shipping Company (USAC) has selected **MacGregor Securing Division's** CV-20 dual function twistlock for its ten new containerships. USAC — the shipowner consortium backed by six Arabian Gulf States — has contracted MacGregor's Securing Division to supply all fixed and loose container fittings (loose fittings including 10 percent spare) including the new CV-20 dual function twistlock for its latest series of ten 24-knot containerships. The vessels are to be built by a trio of Japanese yards, including **Kawasaki Heavy Industries** (the lead yard), which will build four of the 3,800-TEU vessels, and **Mitsubishi Heavy Industries** and **Mitsui Engineering and Shipbuilding** which will each build three ships.

The new dual-function, semi-automatic twistlock type CV-20/DUAL/2 has a symmetrical design which means it can be inserted either way up.

MacGregor also announced that its innovative tween deck covers are to be featured on a trio of 7,500-dwt multipurpose vessels designed to carry cargoes including steel coils, containers and dry bulk. The weatherdeck hatches are served by MacGregor folding panel-pair cover sets, while the tween decks, in the No. 2 and 3 holds are arranged fairly low (well below the mid-height of the hold).



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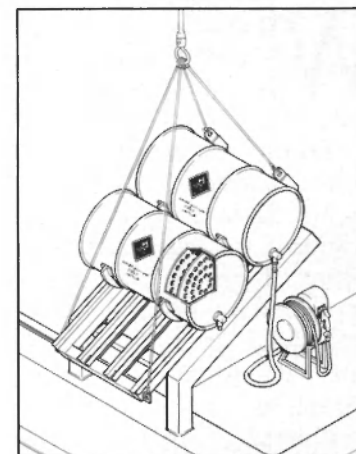
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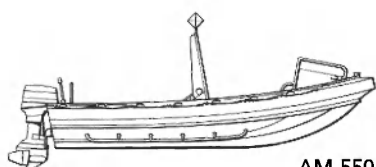
JASON'S CRADLE



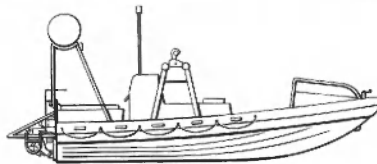
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4.2m SAR Boat



AM-550



AM-700



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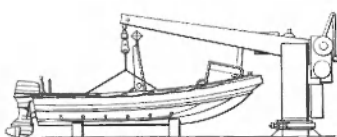
Life Rafts, MEC System, Evacuation Slides

MEC System



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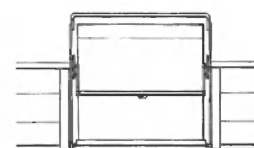


Overhead Gravity Trackway Davit

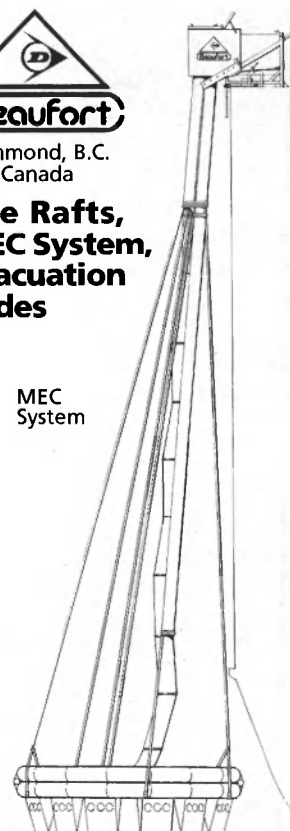
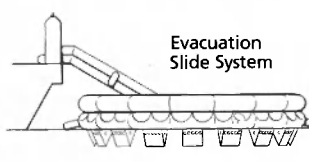
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Evacuation Slide System



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Communications Providers Work To Keep Pace With Marine Users' Needs

Without reliable ship-to-shore and shore-to-ship communications, vessels would be isolated and thus more vulnerable to navigational and safety hazards. This factor combined with the current information revolution — with the Internet making it easier and quicker to exchange data — has led to a boom in the field of satellite communications (satcom).

"Shipping companies rely more on automation and less on people," said **Rich Carlson**, president of Diamond Wireless Group, a telecommunications consulting group in Alexandria, Va. "Companies want to have an open that will allow any technology the shore office has to be extended to their office at sea."

This demand has caused marine communications service providers to act swiftly to make new technologies available. Traditionally, the maritime community relied on Inmarsat-based satellite communications. Established in 1979, Inmarsat was the only system providing global, mobile satellite communications for commercial vessels.

In 1982, Inmarsat-A was launched, but due to the size of the equipment, it was limited to larger vessels. During the next 15 years, Inmarsat-A evolved and now offers telephone, fax, telex, e-mail and high-speed data transmission.

Inmarsat-B was the digital successor to Inmarsat-A, offering enhanced quality, lower charges, dedicated channels for fax and data transmission, and faster data throughput. The antenna height and weight still limited the service to larger vessels and the system required a new hardware investment. This digital technology has not completely replaced analog-based Inmarsat-A.

Inmarsat-C was introduced in 1991 to complement Inmarsat-A, enabling terminals to be installed on vessels of all sizes. It is limited to data communications and forms the basis of most GMDSS outfits.

The newest of the Inmarsat ser-

vices, Inmarsat-M, provides voice, fax and data services at lower speeds than Inmarsat-A or B. It is also compact, like Inmarsat-C. Inmarsat Mini-M provides users with even smaller hardware options. According to Inmarsat, the number of maritime terminals as of May 1997 are as follows: Inmarsat-A, 17,962; Inmarsat-B, 2,589; Inmarsat-C, 21,806; Inmarsat-M, 2,563; and Inmarsat Mini-M, 5,616.

Responding To Evolving Needs

Since its development, many service providers have offered Inmarsat-based communications to their customers. As the communications needs of marine users changed, the service providers have evolved to meet those needs.

Ed Martin of the Mobile Satellite Users Association pointed out that customers are looking to have the same services available to them at work as they have on PCs at home, including web browsing and e-mail. "Telex is going away and there is a move toward digital communications," said Mr. **Martin**, adding, "These digital exchanges, like the Internet, are similar services to those available to users at home."

Stratos Mobile Networks recently introduced its Stratos Connectivity Suite, whereby users are able to access the Internet, web browse and e-mail through a single source, regardless of equipment type.

Inmarsat-A, B, and M users can reportedly perform electronic file transfers including graphics and video.

"Traditionally, applications have been system-driven, forcing customers into a limited range of service options. What we are doing is providing a flexible network in which data can arrive in one format and be delivered in another. For instance, a telex can be sent to an Internet address," said Stratos Marketing and Sales Vice President **Nils Helle**.

American Mobile Satellite Corporation (AMSC) has also iden-

tified the web as a hot spot for the maritime community. Its SKYCELL digital service is available to vessels operating within 200 miles of North American shores, including in the Caribbean and Hawaii. **Renate Neely**, AMSC Corporate Communications director, said Internet access is "as easy as hooking up a modem to your phone at home and dialing your Internet service provider."

SKYCELL also provides voice communications with call waiting, call forwarding, call barring, voice mail and credit card calls. Users can also subscribe to SKYCELL Plus, a dispatch service that allows fleets to communicate from ship-to-shore or vice versa.

Other providers offer basic Internet applications, but have opted not to provide high-end services, such as web browsing and high-speed data transfer.

ORBCOMM President **Alan Parker** believes there is still a strong need for data-only communications. ORBCOMM provides services such as text-only faxes, two-way e-mail and messaging worldwide via user terminals, Internet mail, fax machines and pagers.

COMSAT, the U.S. signatory to Inmarsat, provides global coverage using Inmarsat satellites. COMSAT-A and COMSAT-B customers receive telephone, fax, high-speed data and telex services.

Additional services include e-mail, special telephone services for passenger and crews, group calls whereby the same message is sent to multiple ships simultaneously, and access to land-based computer databanks via packet-switched networks.

COMSAT-C provides smaller vessels with store-and-forwarding messaging via e-mail and telex networks with COMSAT-M furnishing digital voice, fax and data service.

Starting in 2001, service provider Odyssey will offer global coverage for voice, fax, digital data and short messages by mobile and fixed wireless phone. Odyssey will oper-

ate in a dual mode for its mobile cellular customers.

"We will first try to connect to a cellular service," explained Odyssey Public Relations Manager **Jack Prichett**. "If the service is unavailable, we will uplink the customer to a satellite service without having to switch phones." Both mobile and fixed wire phones will utilize digital technology so Odyssey's customers can access the web, but due to low rates of transmission, graphics will not be viewable.

Looking Ahead To Tomorrow's Technology

Industry analysts and participants are in disagreement about whether Inmarsat is here to stay or if new technologies will take over. According to Mr. **Carlson**, "Today, all roads lead to Inmarsat. The development of new technologies will drive down Inmarsat prices and enable users to do more."

Mr. **Parker** offered another view: "LEO (Low Earth Orbits satellite) systems will have their role, but with a higher price." Mr. **Neely** concurred, stating: "LEOs are going to change the face of [satcom]."

LEOs offer handheld phone service via satellite — a service under production at ICO, GlobalStar and Iridium, and expected to be operational around 2000 when each company completes their satellite launches.

The technology is said to provide a better chance getting of unblocked signals due to the systems' elevation angles. While this technology may drive down the cost of Inmarsat-based services, established marine communications providers expect to remain viable because of their capability to provide data interconnections to maritime customers as new applications emerge.

This article was contributed by Tracey Roach, a representative of Stratos Mobile Networks.



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BE ANYWHERE, MAKE SURE
IT ISN'T NOWHERE.**

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connection**

The following provides brief updates on recent activities of companies providing navigation and communications-related products. For additional information on any of the products or services listed, please circle the appropriate number on the Reader Service Card in this edition.

**U.K. Hydrographic Office
Logs Another First**

A demonstration of the world's first electronic navigation chart/raster chart dual fuel system is being conducted in the South China Sea. *Katrine Maersk* is reportedly undertaking at-sea

demonstrations to show the safe and efficient use of both raster and vector data within the ship's electronic navigational system. The U.K. Hydrographic Office touts the combined use of official vector and official raster charts as a major step forward in marine safety.

Circle 182 on Reader Service Card

Tidal Prediction Software Released

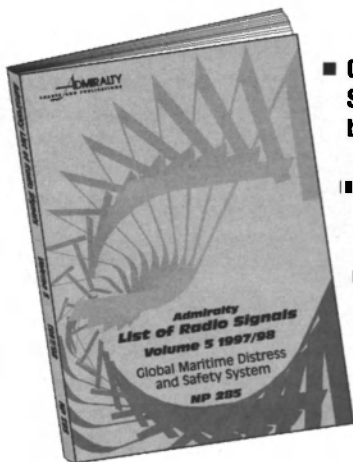
Tides & Currents Pro for Windows is now available, a program which uses official British Admiralty data. The program is available as a package or for separate regions.

Circle 198 on Reader Service Card

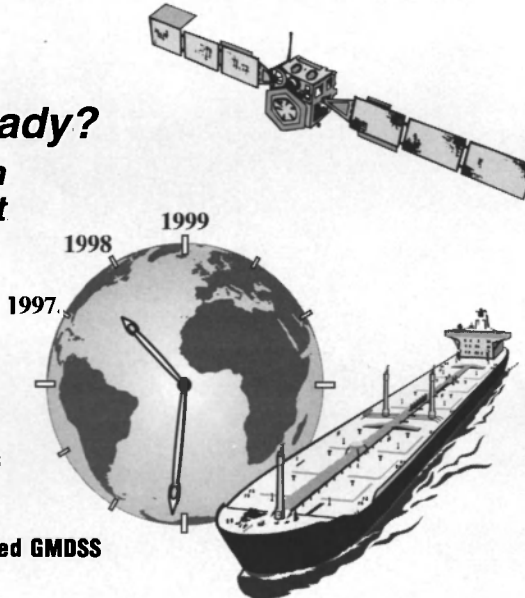
GMDSS

The clock is ticking - Will you be ready?

Be prepared! Order the new 1997/98 edition of ALRS Volume 5 now from your nearest Admiralty Distributor.



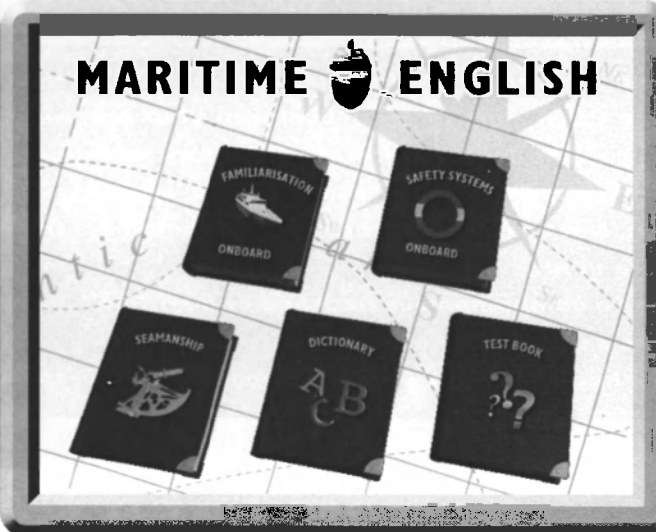
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Circle 313 on Reader Service Card



Mini-M Service Unveiled

SAIT Radio Holland, in association with France Telecom, has developed a portable, mini-M telephone service designed specifically for use by business professionals. The package contains an SIM giving access to services for people working in remote areas.

Circle 197 on Reader Service Card

Sasco Contracts With ORB-COMM

ORBCOMM USA L.P. signed an agreement with Sasco, which will provide messaging and tracking services for the latter's fishing fleet using the ORBCOMM low-Earth orbit satellite system.

Circle 196 on Reader Service Card

Stratos Enters Partnership

Stratos Mobile Networks entered a partnership with Cable & Wireless BIMCOM to provide C-Mail to the maritime industry. C-Mail is a messaging service for ship-to-shore and shore-to-ship communications using Inmarsat-C.

Circle 199 on Reader Service Card

STN Atlas Offers New Mini-Satphone

SP 2000M is a new low-cost, notebook-sized satphone from STN Atlas Elektronik. It allows two-way worldwide voice, fax and data transmission via Inmarsat's Series 3 spot-beam satellites.

Circle 195 on Reader Service Card

Boatrac Expands

The Boatrac system provides two-way communications between vessels at sea or on inland waterways and base stations on land, or with other vessels. It also allows for real-time vessel tracking. The company has contracted to install its products on Canal Barge's entire fleet.

Circle 194 on Reader Service Card

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Circle 284 on Reader Service Card



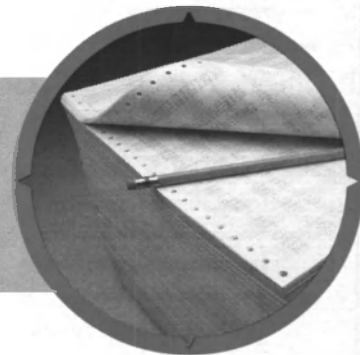
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Thrane & Thrane GMDSS Model Approved

Thrane & Thrane gained full type-approval from Inmarsat for its latest maritime Capsat-C GMDSS model TT-3020C. According to Thrane & Thrane, the new system is very compact with low power consumption.

Circle 193 on Reader Service Card

Low-Cost Satellite Time Available

MarineSat, a subsidiary of ICG Satellite Services, provides low-cost satellite telecommunications services. The L-band satellite system delivers digital voice, fax and data services for vessels or fixed-site locations that do not need full-time, dedicated telecommunications.

Circle 192 on Reader Service Card

Telstra Provides EPIRB Service

Telstra, in conjunction with Inmarsat, is a major player in the provision of the global Emergency Position Indication Radio Beacon (EPIRB) service for the maritime industry through Satcom-E. Satcom-E is designed to send a distress message within three minutes of activation.

Circle 191 on Reader Service Card

Litton Marine Systems Exhibits In Oslo

Litton Industries recently presented its complete line of marine electronic products from Sperry Marine, Decca Marine and C. Plath under one common banner at Nor-Shipping. Litton has been a leader of the trend toward industry consolidation, and it now provides one reliable source for marine electronics. Product lines include integrated bridges, voyage management systems, type-approved radar systems, autopilots, gyrocompasses, communications, monitoring and control, and more.

Circle 177 on Reader Service Card

Racal Launches New DGPS

A new DGPS service covering all of Europe has been launched by Racal Survey. The MarineStar service is fully operational and reportedly provides five meter accuracy across

a region extending from the Mediterranean to the Baltic and Norwegian Seas, and from the Western Atlantic throughout the North Sea.

Circle 190 on Reader Service Card

Keystone Equips Cape Kennedy and Cape Knox With Malin Products

Keystone Shipping Co. has provided the Malin 300 diesel engine analyzer and Malin CDM crankshaft deflection analyzer for *Cape Kennedy* and *Cape Knox*. These analyzers are reportedly easy to use, and help diesel operators to increase reliability, improve operations and reduce costs.

Circle 38 on Reader Service Card

Satellite 12 Previews Satphone Services

At Nor-Shipping Station 12 showed its advanced global satellite system via live tests. Featured was DataConnect, a satellite-based e-mail system designed for maritime users, allowing messages and data files to be exchanged at any time. The system can work with existing satellite connections.

Circle 188 on Reader Service Card

Company Prepares For U.S. Launch

Vision Navigation, manufacturer of a range of GPS navigation products — is set to launch its systems in the U.S. marketplace. The units — including the new GPS Nav-07 fixed receiver — will be distributed through O'Gara Satellite Networks of Deer Park, N.Y.

Circle 187 on Reader Service Card

C-Plath Streamlines Products

C. Plath's Navigat 2100 is a fiber-optic gyrocompass comprising three fiber-optic gyroscopes. It has no moving parts.

Circle 189 on Reader Service Card

SKY Debuts New Ruggedized Computer

SKY has introduced SKYpack, a high-speed small form factor signal processor designed for harsh environments. SKYpack delivers 1.28 GFLOPS in a small, rugged enclosure.

Circle 186 on Reader Service Card



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Hoi Tung Communication & Navigation Co. Ltd
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- RUSSIA**
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Moretron Ltd. - Murmansk
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Optim Senegal - Dakar
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Radio Holland Group, Paarden Eiland (Cape Town)
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- SPAIN**
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Racal Svenska AB, Vastra Frolunda (Goteborg)
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Circle 304 on Reader Service Card

Consortium Studios Maritime Black Box Feasibility

The MBB Project is a research contract funded by the European Commission for the purpose of studying the maritime black box. The project is led by France's Dassault Electronique, and participants include: EEIG Unitas, Belgium; Sirehna, France; Norcontrol, Norway; Kvaerner, Norway. The group will prepare specifications and requirements, provide the legal framework and develop a demonstrator.

Circle 184 on Reader Service Card

Bridge Control 3000: The Complete Package

Raytheon Anschütz' integrated bridge system (Bridge Control 3000) includes a complete range of navigation equipment from one supplier: ARPA radars; electronic chart; conning display; gyro;

autopilot; speed logs; and DGPS. The bridge console is designed for one person bridge operation.

Circle 185 on Reader Service Card

Transas Leads The Way

Transas Marine continues to improve maritime industry safety by providing innovative products

such as the Navi Sailor NS2400S ECDIS, oil spill simulators and full motion bridge handling simulators and GMDSS simulators.

Circle 183 on Reader Service Card

New Echo Sounder Debuts

Ocean Data's Bathy-500 is used to generate precision depth record-

ings and digital data output. The system features low-power consumption, portability, ease-of-use and rugged construction.

Circle 181 on Reader Service Card

SeaTel Introduces New Stabilized Antenna Systems

SeaTel introduced its Series 96 and 97, an advanced generation of marine stabilized antenna systems for commercial satellite communications and TV-at-sea. The system is designed to offer enhanced accuracy over earlier commercial systems, offering better reliability in voice, fax, satellite TV and high speed data applications.

Circle 180 on Reader Service Card

Datamarine Offers New Video Navigator

Datamarine had teamed up with C-Map to provide LCD video navigator ChartLINK D7000XTC. The new color version of Datamarine's monochrome ChartLINK D7000XT is reportedly the first color VGA, large screen, video navigator to use CF-95 technology via C-Map NT.

Circle 37 on Reader Service Card

Personal Satellite Telephone From O'Gara

The O'Gara Company is now marketing the Compact-M personal satellite telephone through its subsidiary, O'Gara Satellite Networks.

This laptop-sized satellite telephone provides full communications capability including voice, fax, data and secure (STU-III) voice/data. The Compact-M utilizes Inmarsat-M technology with its fully implemented infrastructure of land earth stations and international call routing agreements.

Circle 39 on Reader Service Card

INStar Navigation System Introduced

Advanced Marine Technology introduced INStar, designed to be a high performance Integrated Navigation System.

INStar was created to help avert disasters, and it features highlighted depth contours and spot soundings in unsafe depths, a sensitive visual and audible alarm system, and an anti-grounding section.

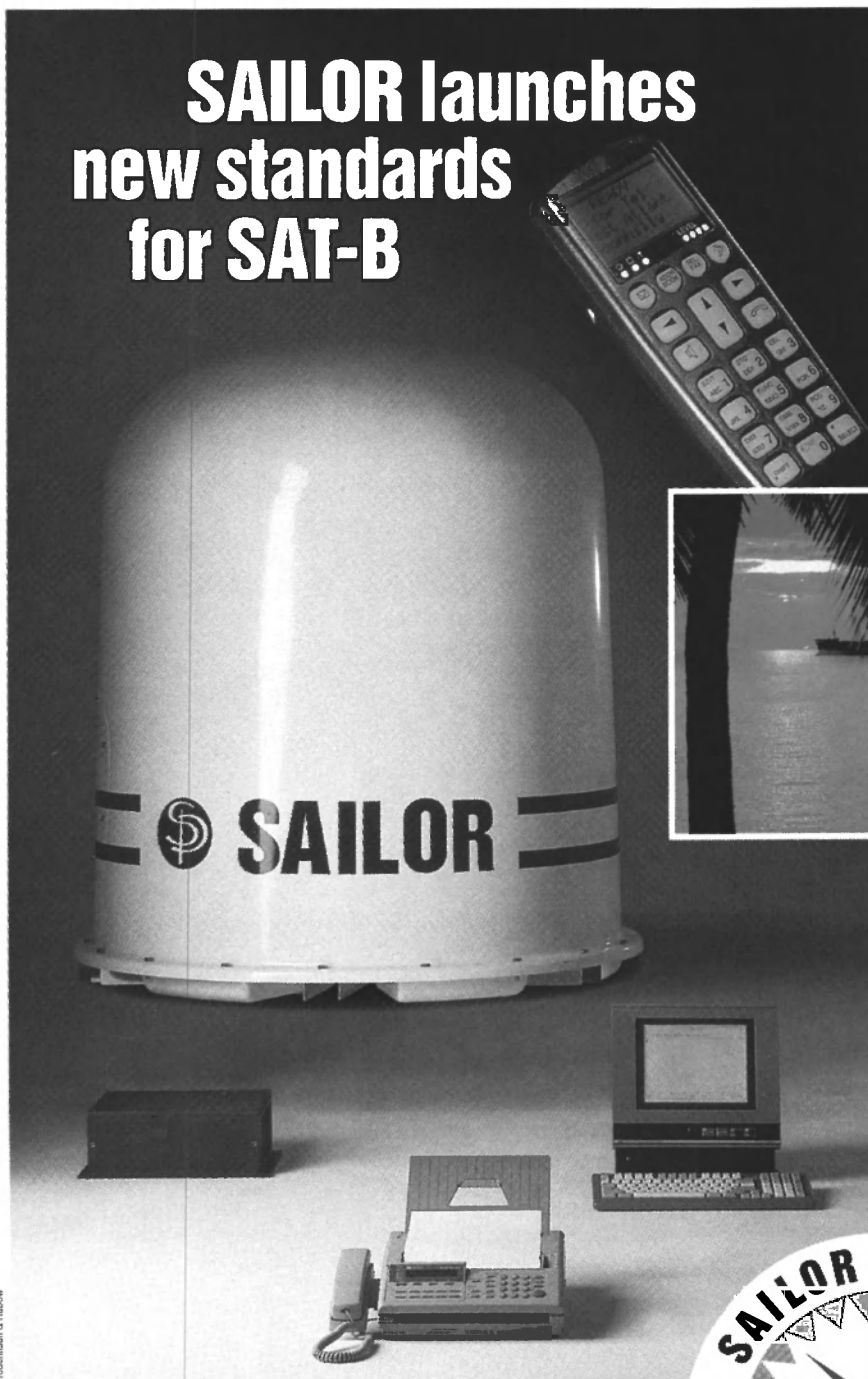
Circle 176 on Reader Service Card

SAILOR launches new standards for SAT-B

SAILOR SAT-B
SP4400

Rotary Joint
Single-cable installation
with standard cable
Easy service access
Ruggedized mechanical
construction
Easy software
modifications
Module-designed
electronics

Frederiksen & Rühlow



Close at hand...

The SAILOR GMDSS CERTIFIED SERVICE concept has been developed to ensure the shipping industry a uniform level of service covering specific requirements for spare parts, replacement units and technical manuals, all supported by annual technical training of service personnel.

In-depth research and development have gone into the creation of the new SAILOR SAT-B. It includes many improved features compared with the equipment previously available on the market. The new SAILOR SAT-B with the "Rotary Joint" provides full freedom of rotation for the antenna and avoids the need for "cable unwrap". This insures constant, unbroken contact with the satellite. The installation is much easier and the servicing accessibility has been considerably improved. System software modifications and service diagnostic tests can be carried out from a personal computer connected to the main transceiver unit. The SAILOR SAT-B is supplied in different versions to meet the communication requirements of users as well as the statutory requirements concerning voice, fax, data and HSD (High Speed Data).

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Circle 304 on Reader Service Card

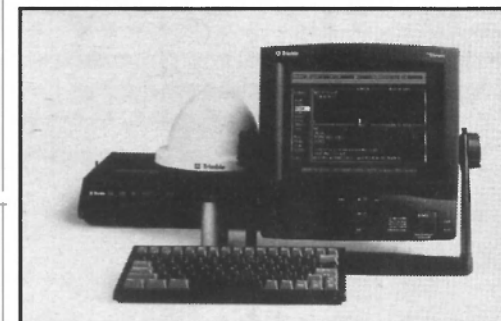
Trimble Launches Galaxy Sentinel

Trimble has embarked on a worldwide, whirlwind "tour" to introduce its new compact Inmarsat-C GMDSS package. The Galaxy Sentinel is an integrated

safety and communications package designed to meet the new requirements of IMO.

"GMDSS is an extremely important market to Trimble's commer-

cial marine business," said **Charles Trimble**, president and CEO. "We are extremely pleased that the Galaxy Sentinel will be playing a major role in supporting



the IMO objective of achieving safety at sea around the globe."

The new system, on display in Oslo recently at the Nor-Shipping exhibition, consists of a suite of equipment specifically designed for GMDSS and the marine environment. The communications unit houses Trimble's Inmarsat-C/GPS transceiver, computer and back-lit LCD display.

Galaxy Sentinel's QuickSend messaging software is pre-installed in the communications unit, and only one screen is needed to send messages and review received messages.

The Trimble GPS is designed to add critical safety and convenience features to Galaxy Sentinel, automatically updating ships' positions and times in compliance with IMO recommendations.

With its built-in GPS receiver, Galaxy Sentinel filters SafetyNET weather and maritime safety broadcasts.

The standard package includes a communications unit, antenna, keyboard and printer.

For more information from Trimble Circle 178 on the Reader Service Card

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coverage
in The
Pacific
Ocean

1 communication partner on all seas for Inmarsat A, B, C & M

1 favorable price & discount system

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+ 1 number to call

= 4 your new global communication partner

As of 14th of May global Inmarsat communication is achieved via EIK® Global Communication for all contract customers. As result of an extended co-operation with BT, Telenor is finally making this possible via a new land earth station in POR. Please call one number: +47 22 77 79 50 for information regarding how to become a contract customer and take benefit of our global services.

Photo: © NPS

Telenor Satellite Services P.O.Box 6914 St. Olavs Plass, N-0130 Oslo, Norway. Tel: +47 22 77 79 50. Fax: +47 22 77 71 78. Telex: 56 72 666 trm n - e-mail: customer-support@in.eik.com

Circle 310 on Reader Service Card




(Continued from page 75)

Sea River Maritime Selects EMS

The inland river division of Sea River Maritime in Baton Rouge, La., has selected Electronic Marine Systems of Rahway, N.J., to develop an expert inland river navigation system employing the EMS Audited River Database and EMS advanced DGPS system. The program reportedly will last one year.

Circle 179 on Reader Service Card



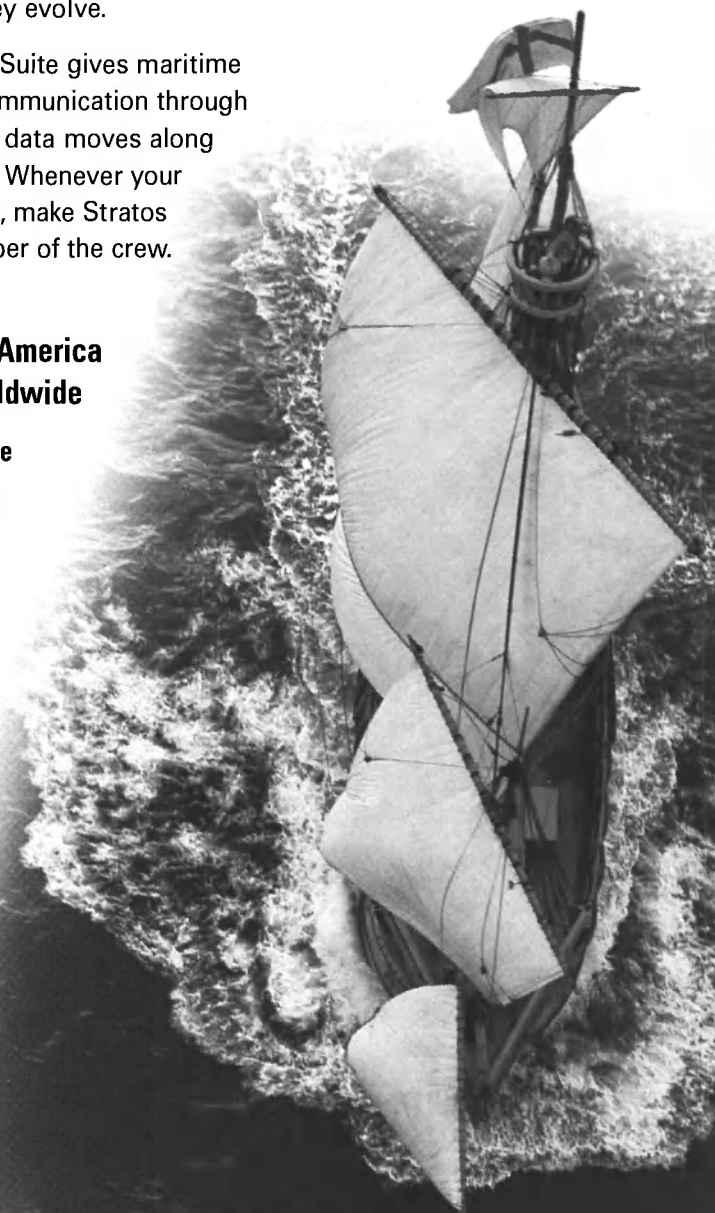
*The world of maritime
communications is
constantly changing,
and we're
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At Stratos Mobile Networks, we offer global satellite communications services that adapt easily to the diverse demands of the maritime environment. Whether your needs are as straightforward as enhanced Telex and fax service or as demanding as high-speed ftp, Stratos Mobile Networks responds with the solution. From global access through our Internet e-mail gateway to individual accounts for every member of your crew, our services adapt to your needs – however they evolve.

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MOBILE NETWORKS

Largest Cummins-Powered Crewboat Joins Gulf of Mexico Fleet

There is a new generation of crewboats evolving to meet the needs of the Gulf of Mexico oil industry as it moves farther offshore. At 170 x 30-ft. (52 x 9-m), Diamond Service's *Paula Kay* — launched at Swift Ships in Morgan City, La. — is stretching the size of these boats to meet oil company

demand.

Mike Swiber, Diamond Service's Purchasing manager, explained, "Customers want bigger boats for their softer ride and safety in tough weather as well as cargo handling. They also want fast boats and the jets are fast enough to beat the weather when

traveling 100 miles offshore." As size grows, owners of the four and five-engined boats have been experimenting with various means of propulsion from straight props, to a mix of props and jets. **Paula Kay** is propelled by jets only.

Owner of the Morgan City-based compan, **Wallace Carline** has

demonstrated his commitment to jets on his last two boats, the Detroit Diesel-powered *Mr. Mel* and the Cat-powered *Lisa Ann*. Like *Paula Kay*, the first two boats feature Hamilton waterjets. But Diamond Services chose four Cummins KTA38-M1 V-12 engines that will each deliver 1,000 hp continuous at 1,800 rpm.

The engines drive through Twin Disc MG 5204 marine gears with 1.5:1 reduction turning the shaft and 22.5-in. impeller at 1,200 rpm.

Paula Kay can carry up to 200 long tons on its 105 x 24-ft. (32 x 7.3-m) cargo deck. Her tankage for transferable fuel is 17,800 gallons. In sea trials the vessel topped out at 31.5 knots with a full complement of 64 passengers and 10 tons of cargo.

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Vosper Thornycroft, VSEL Due To Receive Navy Contract

A joint venture between Vosper Thornycroft Holdings and VSEL will reportedly receive a five-year contract to run the U.K. Royal Navy's Fleet Maintenance and Repair organization.

Ingalls Gets Additional Contracts From Edison Chouest

Ingalls Shipbuilding will build as many as 14 additional deepwater offshore supply vessels for Edison Chouest Offshore of Galliano, La.

The agreement is for Ingalls to build a series of seven 190-ft. (58-m) vessels, with an option for seven more. Ingalls and Edison Chouest previously entered into an agreement (valued from \$40 to \$70 million) for Ingalls to build as many as 17 larger, 240-ft. (73-m) supply vessels. Currently, 11 of those vessels are under contract, with options in place for the remaining six.

The total value of the two programs for Ingalls could reach \$120 million.

For more information on Ingalls
Circle 40 on Reader Service Card

Maritime Reporter/Engineering News

Keppel Wins \$43 Million Contract

Keppel Shipyard reportedly won a \$43 million contract from U.S.-based Falcon Drilling Co. to convert a vessel to a drillship. The work on the 12,000-dwt *Peregrine IV* is scheduled to be completed by mid-1998.

Trico To Buy 12 Vessels

Trico Marine Services has an agreement to buy 12 supply vessels from Otto Candies Inc. for \$69 million cash.

The purchase will bring Trico's supply vessel fleet to 53, and its overall fleet to 82. At the beginning of 1996, it had 39 vessels.

Finnlines Spends \$160 Million On New Ships

Finnlines Oy bought two new RoRo vessels from Swedish company Stena AB for approximately \$160 million.

Finnlines will reportedly finance the investment with a mix of cash and borrowed funds.

The vessels are under construction at the AESA Puerto Real shipyard in Spain.

Daewoo Heavy Wins \$282 Million In Ship Orders

Daewoo Heavy Industries won \$282 million worth of orders to build six ships.

Greece's Chandris Inc. reportedly ordered two 105,000-dwt crude carriers, and Kristen Navigation (also of Greece) ordered two crude carriers. Daewoo also won two bulk carrier orders from Louis Dreyfus Armateurs S.N.C. of France.

Hvide Gets Patent For SDM

Hvide Marine Inc received a U.S. patent for its new ship docking module (SDM).

The company said the module is designed to operate with two crew members, thus reducing operating costs compared with conventional harbor tug operations. Hvide has three docking modules on order.

Fourth Inmarsat-3 Satellite Successfully Launched

The fourth satellite in the Inmarsat-3 series was launched successfully on an Ariane 4 rocket from Kourou, French Guiana.

The satellite will bring virtual

global coverage for Inmarsat's new lightweight portable satellite phone services, and will boost capacity for Inmarsat's other commercial maritime, aeronautical and land-mobile communications systems.

For more information
Circle 46 on Reader Service Card

3.Maj Wins German Orders

Croatia's 3.Maj reported that it secured fixed orders to build two oil and chemical tankers for German clients. These new ships bring 3.Maj's orderbook to seven vessels, all of which are for foreign buyers.

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Pequot Shipworks Launches First Vessel; Wins First Contract

Fast ferry *Sassacus*, the first craft built by the Pequot River Shipworks, owned by the Mashantucket Pequot Tribal Nation, was launched into the Thames River in New London, Conn., on June 11. The new vessel, powered by twin gas turbines coupled to waterjets, is reportedly capable of carrying 302 passengers while cruising at 47 knots. *Sassacus* is

touted as the fastest ferry in the U.S., and the first U.S. vessel to meet the IMO's International High-Speed Code. The 147-ft. (45-m) vessel, built to a design by FBM Marine Group, has been under construction at the tribe's shipyard following its keel laying ceremony last July.

In its first year of operation, the Shipworks reportedly pumped \$6 million into Connecticut's economy, buying \$4 million in goods and services from Connecticut vendors. The shipyard reports an annual payroll in excess of \$2 million.

"This event marks nothing less than a new era in the history of transportation in the United States," said tribal Chairman **Richard A. Hayward**. "This is the first of what we feel will be a large number of fast ferries built for the marine superhighway of the next century. The tribe is committed to alternative means of transportation and the *Sassacus* is an example of that commitment."

At the time of its launching, *Sassacus* was 90 percent complete. Following the outfitting phase of the project, the vessel was to undergo four weeks of dockside testing and sea trials before entering service between New York and southern Connecticut later this year, carrying customers from Pequot-owned Foxwoods Resort Casino, as well as commuters to

and from New York.

Upon entering service, *Sassacus* will be the eighth ship of the TriCat design in operation. The other seven carry passengers between Hong Kong and Macao in the South China Sea. With a crew of 10, *Sassacus* is expected to make the trip from New York City to the mouth of the Thames River in less than 2.5 hrs. Hornblower Marine Services has been contracted to operate the vessel.

In addition, the Pequot River Shipworks has also signed a contract with Buquebúbus, Inc. for the construction and purchase of one of its TriCat fast ferries. The contract marks the first time the tribe has sold one of its new ferries to an outside buyer. The new vessel will carry passengers between Key West and Fort Myers, Fla.

For more information on Pequot River Shipworks
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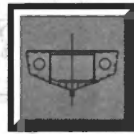
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Maritime Reporter/Engineering News

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IMO Drafts Bulk Carrier Safety Regulations

The Maritime Safety Committee (MSC) of the IMO has drafted regulations to improve the safety of bulk carriers. The regulations will be put forward for adoption at a special bulk carrier safety conference to be held at IMO headquarters in London in November.

The regulations bring in new structural requirements for bulk carriers to prevent vessels from sinking if water enters for any reason, and will apply to new and existing ships. Existing ships which are not in compliance will have to be reinforced or comply

with restrictions on cargo being carried.

This could mean limiting cargoes to light cargoes such as grain, oil or timber, or altering the way cargoes are loaded, which could imply carrying less cargo.

The aim of the regulations is to

reverse the rise in accidents involving bulk carriers since the early 1990s. The regulations are based on standards drawn up by the International Association of Classification Societies (IACS). For more information, contact the IMO at tel: +44 171 463 4040.

Benor To Buy Three Product Carriers For \$55.5 M

Benor Tankers won a contract to purchase three product carriers from Exmar for \$55.5 million.

The 46,100-dwt, double-bottomed and sided product carriers — *Leopard*, *Panther* and *Tiger* — were built at the Boelwerf yard in Belgium in 1985.

All three ships are time chartered out until July, August and September 1999 respectively, at a rate of \$15,000 a day. The cash and stock purchase is expected to close at the end of this month.

In a separate transaction, the Benor board agreed with the company's main shareholder, the TransPetrol Group, to purchase product carrier *Endurance* for \$22 million.

Endurance was built at Hyundai in 1988 and is fixed until March 1998 at a time charter level of \$14,750 per day.

Poland Invites Bids For Baltic Fleet PZB

The Polish Treasury ministry is inviting bids for a stake of not less than 10 percent in Polska Zegluga Baltycka SA (PZB), a shipping firm operating in the Baltic region.

A newspaper advertisement said that investors have until September to place bids.

PZB is based in Kolobrzeg, and the company reportedly owns five ferries, seven smaller ships, two ferry hubs and a commercial port (in Kolobrzeg) with a loading capacity of 350,000 tons.

PZB reportedly serviced 383,800 passengers last year and carried 74,930 cars and 19,956 commercial vehicles.

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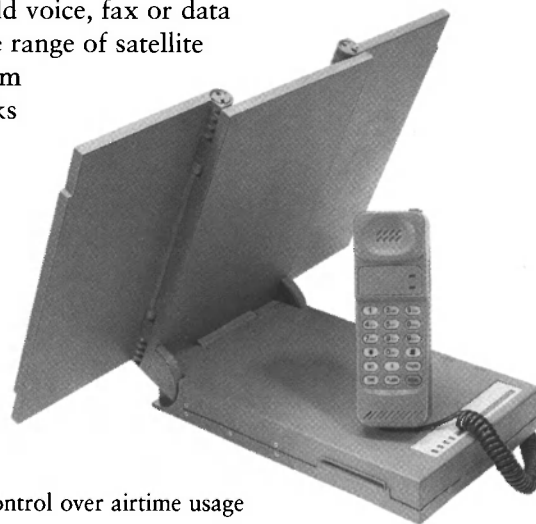
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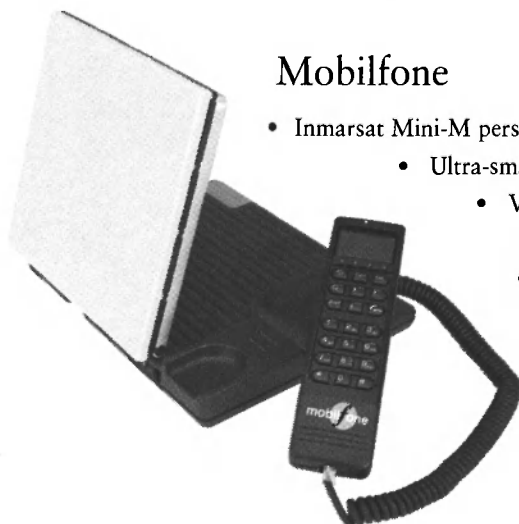
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PEOPLE & COMPANY NEWS

McConkey Joins Biocontrol Group

Biocontrol Technology, Inc. announced that **Phil McConkey** has assumed the position of chief operating officer for subsidiary Petrol Rem, Inc., responsible for overall direction of the company with emphasis on sales and marketing of the company's oil spill cleanup products.

Mr. **McConkey** served five years in the Navy as a helicopter pilot and communications officer, and has also been a wide receiver for the New York Giants football team. Most previously, he was managing director of Alexander & Alexander Inc.'s Greater New York Insurance Services Practice.

Palmer Johnson Opens Office; Names VP



Alton Herndon

"Our goal is to promote Palmer Johnson to new clients," said **Bill Parsons**, president of Palmer Johnson Inc. of Sturgeon Bay, Wis., as he announced plans for the yacht building company to open a new office in Fort Lauderdale this summer.

The office will be staffed by **John Spencer, Mike Kelsey, Jr.**, and Capt. **Jennifer Schubert**.

In addition, **Alton Herndon** has been named executive vice president of parent company Palmer Johnson Enterprises. He was previously the president of Hatteras Yachts for 11 years, where he began his career 28 years ago as an industrial engineer.

Trinity Seal Crew Honored For Offshore Platform Rescue

On May 30, Capt. **Randall Treon** and the four-member MV *Trinity Seal* crew were recognized at a dinner held in their honor by American Exploration at the Petroleum Club in Houston. The ship's crew carried out the safe evacuation of 42 personnel on American Exploration's East Cameron Block 328 platform when the A-6 well blew out on April 1.

"American Exploration believes the decisive and courageous action by the captain and crew of the *Trinity Seal*, without regard for their own safety, may well have saved the lives of the platform personnel," said CEO **Mark Andrews**.

The platform ignited shortly

after full evacuation and burned for three days. The well was capped on May 18th, reportedly without adverse spill from the blowout and fire. Production from the platform is expected to be delayed, but not impaired, while facilities are rebuilt and drilling is resumed.

Clough Recognized For Fisheries Management Work

U.S. Fish and Wildlife Service Southeast Regional Director **Noreen K. Clough** has been named the American Sportfishing Association's 1997 Woman of the



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PEOPLE & COMPANY NEWS

Year, recognizing her leadership in the development of a plan for managing the region's fisheries and aquatic resources.

She directs the Service's fish, wildlife and habitat conservation, protection and enhancement activities in 10 southeastern states, Puerto Rico and the Virgin Islands.

Previously Ms. **Clough** served as deputy assistant director for Fisheries, and as acting deputy director of External Affairs, where she was responsible for administering the Federal Aid to States program, which supports fish, wildlife and environmental conservation projects.

She has also been a recipient of the Department of the Interior's Meritorious Service Award.

SEA Inc. Honors Worbass

Datamarine International unit

SEA Inc. recently paid tribute **Jack Worbass** for the role he has played in the marine electronics segment during the last 20 years.

"**Jack Worbass** has done a commendable job since the inception of SEA and over a span of the last two decades, in positioning SEA as the market leader for MF/HF marine singlesideband radiotelephones in North America," said CEO **David Thompson**.

Formerly Marketing manager for the company, Mr. **Worbass** is still involved with SEA as a consultant and is focusing on developing new business in Asian markets.

Halliburton Announces Senior Appointments

Halliburton Company named **Dave Lesar** president and COO; **Ken LeSuer** was named vice chairman; and **Gary Morris** was appointed executive vice president and CFO.

Previously, Mr. **Lesar** was both executive vice president and CFO of Halliburton Company and Brown & Root, Inc. president and CEO.

Mr. **LeSuer** most recently served as Halliburton Energy Group CEO. Mr. **Morris** previously served as senior vice president for Halliburton.

C-MAP Licenses Product To Japanese Manufacturer

C-MAP has licensed Japan Radio Company (JRC) of Tokyo to use C-MAPNT in its NWU-800 commercial plotter. JRC's charting system is designed primarily for commercial and sportfishing mariners.

Mott Leads NTL



Newfoundland Transshipment Limited (NTL) has reported that **Harvey Mott** is leading the company as its president. His previous employment experience includes a 25-year career with Mobil during which time he held management positions in all aspects of tanker operations.

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PEOPLE & COMPANY NEWS

In 1994 Mr. **Mott** was appointed GM of Crude Transportation for Hibernia Management and Development Co. and was responsible for establishing the tanker transportation system for the Hibernia project.

NTL is owned by Mobil, Chevron and Petro-Canada, and the company is presently building a transshipment facility at Whiffen Head, Newfoundland.

Bellingham Australia Names GM



John Spragg

Australian floating dock system designer and manufacturer Bellingham Marine Australia Pty Ltd. has appointed **John R. Spragg** as its general manager. He was previously employed by long-time Bellingham licensee Fletcher Construction Australia in its Marine Division, and is extremely knowledgeable of the Southeast Asian marine market.

Ship Automation Specialist Changes Name

Norway's Lyngsø Marine has changed its name to Valmarine in order to emphasize its product identity, and distinguish itself from a Danish company of the same name which manufactures a different range of products.

Located outside Oslo, Valmarine supplies Damatic XD control, alarm and monitoring systems to a wide range of vessels, including cruise ships, product carriers, high-speed craft and research and naval vessels. The company was originally founded as a subsidiary of Valmet Automation in Finland, which is still its major sub-supplier.

Texaco Promotes Young

Carole Young was named assistant to the president of Texaco North America Production. She formerly served as staff coordinator in the Corporate Planning and Economics department of Texaco Inc. In her new role, Ms. **Young** will be responsible for supporting Texaco's E&P activities in North America, as well as coordinating

community outreach and diversity initiatives.

Navy Initiates Vessel-Naming Competition

Elementary and secondary

school students have been invited to form teams of four or more to research and propose a name for the U.S. Navy's newest oceanographic survey vessel. This project was initiated by Oceanographer of the Navy RADM. **Paul Tobin**, and authorized by Navy Secretary

John Dalton.

Reps from winning teams will receive trips to Washington, D.C., and the grand winner will receive a trip to the ship's christening and launch.

Entries will be judged on creativity, evidence of educational

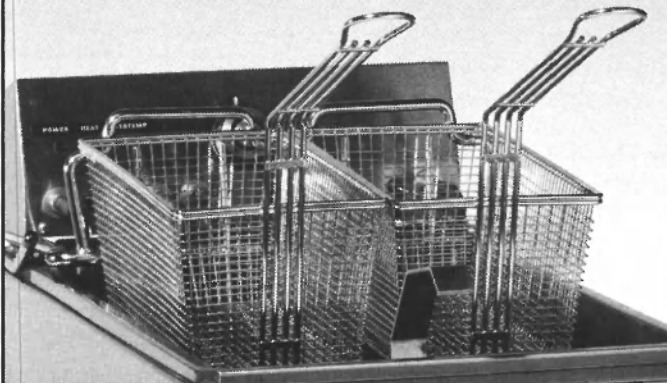
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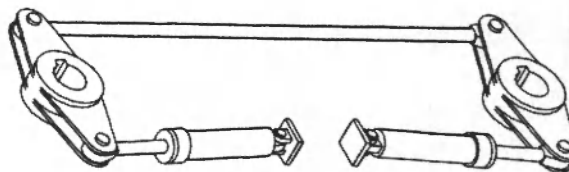
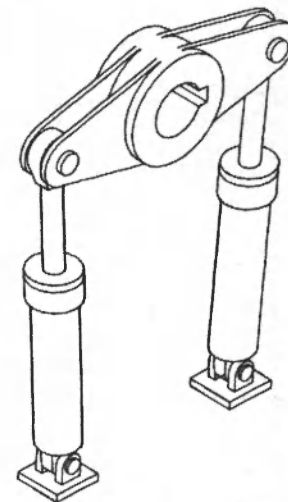
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PEOPLE & COMPANY NEWS

value and incorporation of academic disciplines.

U.S. Organizations Co-Sponsor Marine Safety Awards

The U.S. maritime industry honored companies for their ship safety achievements in New Orleans on May 15.

The awards, jointly sponsored by the U.S. Chamber of Shipping (USCS) and the Marine Section of the National Safety Council (NSC), called public attention to the achievements of several companies, including SeaRiver

Maritime — whose vessel S/R *Bayou State* has conducted 21 years of accident-free operations, and Cleveland Tankers, Inc. — whose vessel M/V *Gemini* has maintained an accident-free record for 17 years.

The awards were presented by USCS Vice President **Joseph Cox** and NSC Marine Section Chair **DeWitt Davis**.

ACBL Announces Appointments

American Commercial Barge Line Co. (ACBL) has announced several new staff appointments. **Elaine Bullard** and **Patrick**

Hoessle have joined the company as dispatch support. **Jim Fox** has been named vice president of Operations and general manager at ACBL de Venezuela. **Pete Kazunas** has been promoted to director of Bulk and Steel Sales, and **Kenneth A. Sigler** is the company's new manager of Bulk and Steel Sales. **Alan Roach** has been appointed Liquid Sales manager. **Mike Shadoan** has joined Jeffboat as Labor Relations manager. **Robert Siddall** is ACBL's new Barge Regulatory coordinator. **John W. Trampas** has joined ACBL as manager of Grain Freight Sales.

Smith Fiberglass Announces New Hires

Smith Fiberglass Products Inc., manufacturer of fiberglass piping systems for the petroleum, chemical and industrial markets, has named **Robert Denton** and **Brad Francis** district sales managers.

Adtech Names Distributor

The Minneapolis office of Interplastic Distribution Group (IDG) was named a distributor for Adtech Plastic Systems Corp. of Charlotte, Mich. Adtech manufactures epoxy, polyester and urethane products for boatbuilding and other plastic fabrication applications.

Chris-Marine Expands Australian Business

Chris-Marine (Australia) Pty. Ltd. has recently acquired two service companies in New South Wales. The new divisions are: Groom Bros., involved in general machine repairs; and Lesmar & Associates, involved in propeller shafts and stern tube repairs. With the inclusion of these companies, Chris-Marine strives to expand its range of service work for shipowners on Australia's East Coast. The Chris-Marine group distributes portable maintenance machines for marine and stationary diesel engines, and also provides on-site technical assistance.

Halter Hires Roberts; Acquires McDermott Yard

Ship repair and conversion specialist **Joseph Roberts** has joined Halter-Gulf Repair, Inc. He is the superintendent responsible for liaison between Halter and its customers whose vessels are undergoing repair or conversion at the yard.

Prior to assuming this post Mr. **Roberts** served as a consultant for Halter as an employee of J.R. & Associates.

On June 5, Halter Marine announced acquisition of the former McDermott shipyard on the Industrial Seaway in Gulfport, Miss. The 74-

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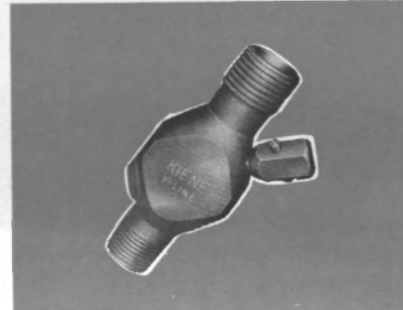
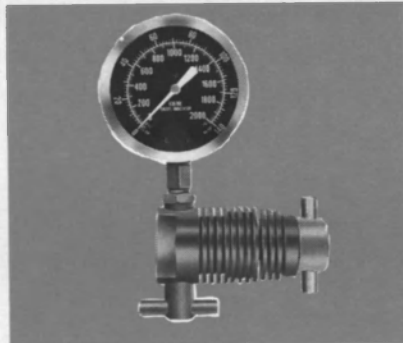
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PEOPLE & COMPANY NEWS

acre facility will be called Halter Gulfport Central and will build components for Military Sealift Command ships currently under construction by the company.

Coflexip Stena Offshore Announces Management Changes

Subsea oilfield service company Coflexip Stena Offshore reorganized its U.S. management following the departure of **Kevin Peterson**. **Allen Leatt** was named CEO of Perry Tritech Inc. in Jupiter, Fla., and U.S. Investor Relations officer. **Ken Hulls** was appointed president and CEO of Coflexip Stena Offshore in Houston.

Cegelec Announces Senior Appointments

Cegelec Automation, Inc. (CAI) has announced that **Frank C. Voelker** has been named executive vice president and CEO, and **Richard**

W. Gfeller has assumed the position of chief financial officer.

Immediately prior to assuming his latest appointment, Mr. **Voelker** served as Projects general manager for Tippins Inc. Mr. **Gfeller** was assistant director of Group Audit Services for Alcatel Alsthom in Paris before accepting his current position.

Headquartered in Pittsburgh, Cegelec Automation is the U.S. subsidiary of Cegelec, the electrical engineering arm of Alcatel Alsthom. CAI provides automation and control technology to a wide range of industries.

ASNE Announces New Leaders And Awards Recipients

The American Society of Naval Engineers (ASNE) has named **Dona Lee** as its new technical director, responsible for maintaining

technical liaison with components of the society responsible for naval engineering outreach, symposia, professional development and education. ASNE has also announced the names of the recipients of its annual awards. **Dr. Norman Owsley** received the Gold Medal Award for his work in acoustic detection and processing systems.

Other award winners were as follows: **William Rogalski, Jr.** (Frank G. Law Award); **William Hockberger** ("Jimmie" Hamilton Award); USN Commander **Kevin McCoy** (Claud A. Jones Award); **Alan Forsell** (Harold E. Saunders Award); and **Dr. Bruce Sandman** (Solberg Award). In addition, USN Capt. **Joseph Yurso** (Ret.) was named president of ASNE for a two-year term, and USN Radm. **David Putnam Sargent, Jr.** was named vice president for a three-year term.

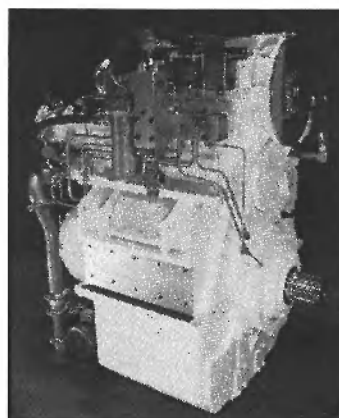
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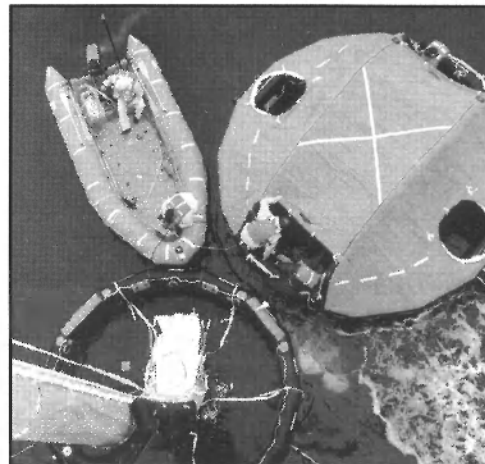
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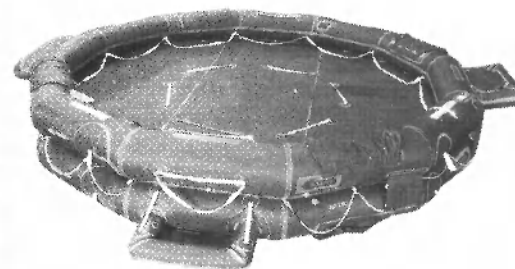
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PEOPLE & COMPANY NEWS

Zachary Joins CH2M Hill

CH2M Hill announced that **Mike Zachary** has joined its Oakland, Calif.-based Transportation Business Group as director of Ports and Intermodal Projects. The company provides full services for the financing,

development, design, construction, operation and management of industrial facilities and public infrastructure.

Seaclear Promotes Marino

Seaclear Industries, Inc., located in Woodinville, Wash., has appointed **Wendy Marino** to the

position of vice president, Sales and Marketing. Ms. **Marino** has been employed by Seaclear for five years and her new responsibilities will include the marketing of the company's marine window defoggers and promotion of Seaview, the company's laminated heated glass division.

New Martec Office In Operation

Martec International — supplier of dry container, reefer and chassis parts, and containership and RoRo lashing materials — has opened an office/warehouse in Paramount, Calif., only 10 miles from the Ports of Los Angeles and Long Beach. **Craig Rapoza** serves as GM for the new West Coast facility, dubbed Martec Marine International, Inc.

ILS Appoints Asia Pacific Manager



Richard Tham

Inventory Locator Service, LP (ILS) has named **Richard S.F. Tham** as Asia Pacific region manager, responsible for management of the company's reps throughout the territory.

Mr. **Tham** will also retain responsibilities for direct sales of ILS online information services in Hong Kong, the Philippines and Taiwan.

ILS provides online information for the marine industry that brings together buyers and suppliers of parts, equipment and services.

Muller Joins USMMA Faculty

Gerhardt Muller has joined the faculty of the U.S. Merchant Marine Academy (USMMA) in a dual capacity as an associate professor in the Marine Transportation department and as Transportation Center program manager of the Continuing Education department. He recently completed 28 years of service at the Port of NY/NJ, has taught courses at New York state colleges and at World Maritime University in Sweden, and is the author of *Intermodal Freight Transportation* — a book used as a basic reference guide on intermodalism.



Gerhardt Muller

H.E.R.C. And Calgon Form Alliance

H.E.R.C. Inc. and Calgon Corp. have formed an alliance whereby the two interests will work together to co-market H.E.R.C.'s chemical cleaning products and process-

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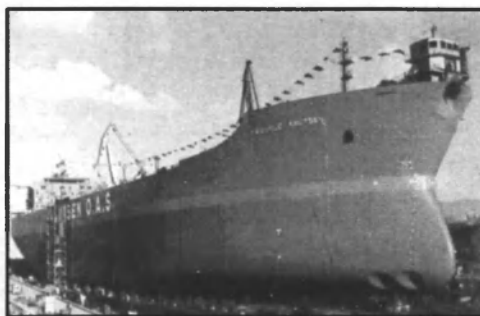
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PEOPLE & COMPANY NEWS

es and Calgon's chemical passivation and inhibition processes.

The alliance has been dubbed "The Clean Water Crew," and under the terms of the agreement, all of Calgon's U.S. and Canadian distributors will market H.E.R.C.'s products and services. Reciprocally, H.E.R.C. will offer Calgon's products to its Pipe-Klean and Well-Klean customers.

Clarkson Names Deputy Chair

Gary Weston has been named deputy chair of international shipbroking company H Clarkson & Co. Ltd. He has headed up the company's Dry Cargo division since 1990 and has been a director of parent company Horace Clarkson plc for the past five years.

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ISC Announces Executive Promotions

International Shipholding Corp. (ISC) has named **Niels Johnsen** chairman of Central Gulf Lines, Inc. and Forest Lines Inc. He will continue to serve as president of Waterman Steamship Corp and N.W. Johnsen & Co.



Erik Johnsen



Niels Johnsen

Inc. **Erik Johnsen** will act as president of Central Gulf Lines, Inc. and Forest Lines Inc., and as executive vice president of Waterman Steamship Corp.

Namata Recognized For Contributions To Field

Edward Numata, 76, died on April 28 of brain cancer.

Friends of Mr. Numata wrote to *Maritime Reporter* and asked that he be remembered for his contributions to the maritime field.

In his lifetime, Mr. Numata published more than 200 technical papers and taught at Stevens Institute of Technology as an architecture and ocean engineering professor for more than 30 years.

He began his career at George Sharp, Inc. naval architecture firm in New York City and was involved in the design of ships for the Navy and commercial industry during World War II.

Mr. Numata's papers are frequently referred to for the construction of safe offshore platforms.

According to **Naresh Maniar**, vice president of M. Rosenblatt & Son, "Mr. Edward Numata was one of the most respected engineers in the field of model testing and performance prediction of ships and offshore platforms. He will be remembered for his professionalism and his decent and fair demeanor."

Oronite Announces Appointment

Chevron's Oronite Additives' Americas Region announced that **William E. Place** is serving as OEM technical liaison for heavy-duty diesel and passenger car motor oil additives. He will be located in the Detroit area.

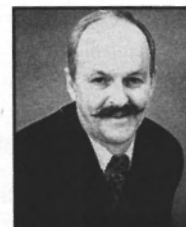
Andy Tugendhat is responsible for all OEM relationships in North and South America.

McDermott Names Board Members

Roger E. Tetrault, CEO and chairman of the board of J. Ray McDermott, S.A., announced that the company's board of directors has elected three new members. The new board members are: **Robert L. Howard**, a retired Shell Oil Company executive; **William J. Johnson**, an oil and gas executive and independent consultant; and **Robert H. Rawle**, president and COO of the company.

Safety Supplier Appoints Managing Director

Netherlands-based safety system supplier Umoe Schat-Haring Group has appointed **Svein Arne Saeberg** as managing director of lifeboat building subsidiary Umoe Schat-Harding AS. Based in Rosendal, Norway, Mr. **Saeberg** is responsible for all lifeboat production within the group.



Svein Saeberg

Marshall Islands Become 80th Inmarsat Member

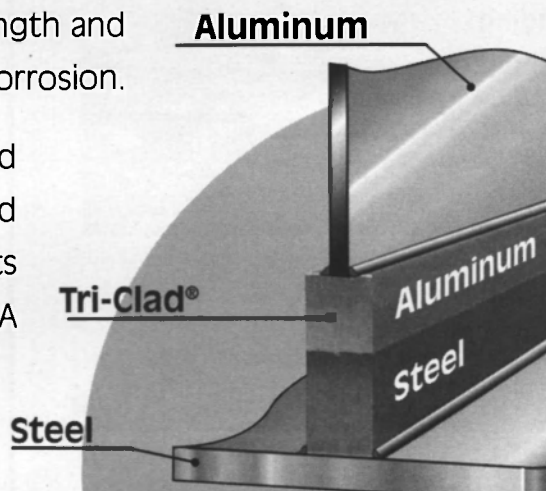
The Marshall Islands have joined Inmarsat, the global mobile satellite organization. The Trust Company of the Marshall Islands will serve as its signatory organization. Marshall Islands-flagged vessels are already using Inmarsat for emergency and safety-related communications, namely GMDSS.

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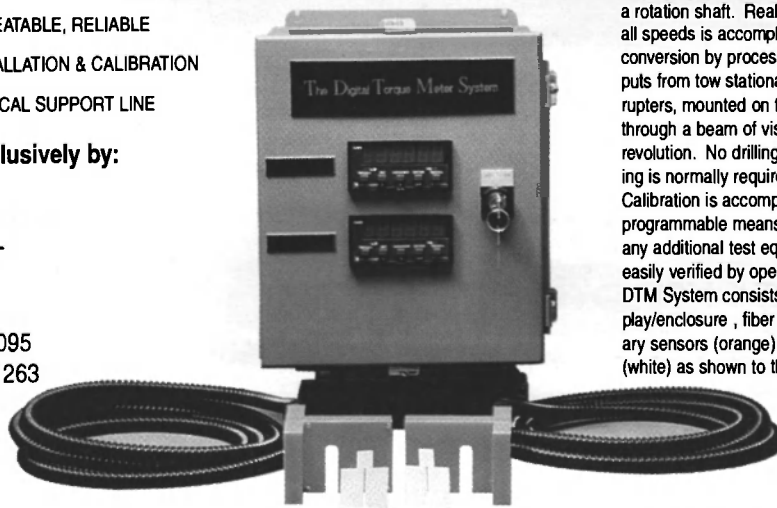
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JULY 1997

Asia-Pacific Fishing: July 7-10, 1997, Cairns, Australia.

Contact: Baird Publications, 10 Oxford St., South Yarra 3141, VIC, Australia, tel: +61 3 9826 8741; fax: +61 3 9827 0704; or in U.K., 4A Carmelite St., London EC4Y 0BN, tel: +44 171 353 1085; fax: +44 171 353 1084.

U.S. Navy International Logistics Symposium (NILS): July 14-16, Hyatt Regency Crystal City, Arlington, Va.

Contact: Sally Cook, American Society of Naval Engineers (ASNE), 1452 Duke St., Alexandria, Va. 22314-3458; tel: (703) 836-6727; fax: (703) 836-7491.

Hunt Design Rendezvous: July 18-20, Fort Adams, Newport, R.I.

Contact: C. Raymond Hunt Associates, Inc., 69 Long Wharf, Boston, MA 02110, tel: (617) 742-5669; fax: (617) 742-6354; or Sherry Marx, The Museum of Yachting, P.O. Box 129, Fort Adams State Park, Newport, R.I. 02840, tel: (401) 847-1018; fax: (401) 847-8320.

Fast '97: Fourth International Conference On Fast Sea Transportation: July 21-23, 1997, Sydney, Australia.

Contact: Conference Secretariat, Baird Publications Pty. Ltd., P.O. Box 460, South Yarra 3141, VIC, Australia, tel: +61 0 3 9826 8741; fax: +61 0 3 9827 0794.

AUGUST 1997

Aqua Nor '97: August 10-16, Trondheim, Norway.

Contact: Odd Berg, tel: +47 73 92 93 30; fax: +47 73 51 61 35.

SEPTEMBER 1997

Offshore Europe '97: September 1997, Aberdeen, Scotland.

Contact: International Expositions, Inc., 1635 W. Alabama, Houston, TX 77006, tel: (713) 529-1616; fax: (713) 529-0936.

International Maritime Lecturers' Association (IMLA) Conference/Workshop '97: September 7-9, Fisheries and Marine Institute of Memorial University, Newfoundland.

Contact: Les O'Reilly, executive director, P.O. Box 4920, St. John's, Newfoundland, Canada A1C 5R3, tel: (709) 778-0200; fax: (709) 778-0346.

1997 American Int'l Ship Expo (AISE): September 9-11, New York Coliseum, New York City.

Contact: McNabb Expositions, Inc., P.O. Box 418, Rockport, Maine 04856-0418,

tel: (207) 236-6196; fax: (207) 236-0369.

NEVA 97 (The Int'l Shipping Exhibition with Russia and the Republics): September 9-13, St. Petersburg, Russia.

Contact: Pedro Svensson, P.O. Box 28, S-

184 21, Akersberga, Sweden, tel/fax: +46 8540 24105.

MCMC '97 (Conference on Vessel Maneuvering/Control of Marine Craft): September 10-12, Brijuni, Croatia.

Contact: Prof. G.N. Roberts, University of

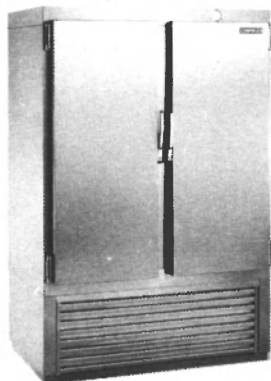
Wales College, Newport, Faculty of Technology, Allt-yr-yn Campus, P.O. Box 180, Newport NP9 5XR, U.K., tel: +44 1633 432 441; fax: +44 1633 432 430; e-mail: geoffr@gwent.ac.uk.

World Fishing - Vigo '97: September 17-21, Vigo, Spain.



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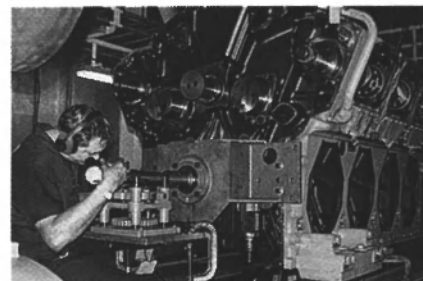
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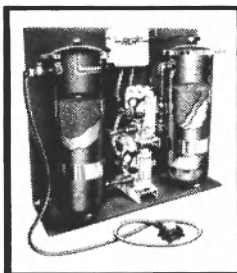
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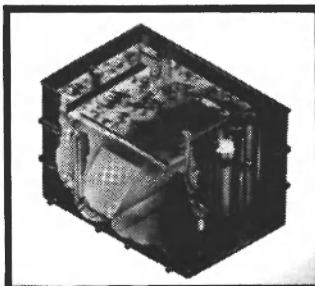
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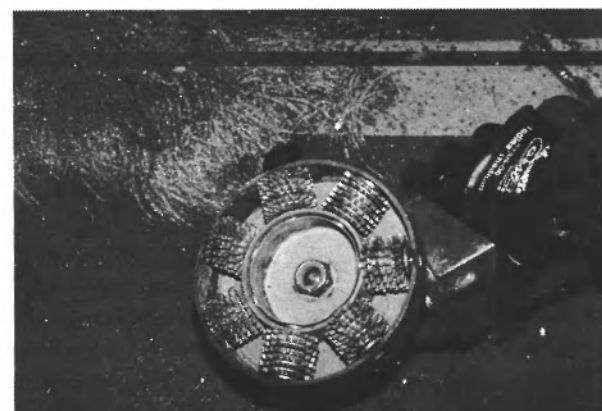
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CALENDAR

Contact: Nexus Media Ltd., Top Floor, 84 Kew Rd., Richmond, Surrey TW9 2PQ, U.K., tel: +44 181 332 9273; fax: +44 181 332 9335.

AAPA's 86th Annual Convention: September 22-26, Marriott at Sawgrass, Jacksonville, Fla.

Contact: Eileen Denne, P.R. director, American Association of Port Authorities, 1010 Duke St., Alexandria, Va. 22314, tel: (703) 684-5700; fax: (703) 684-6321, e-mail: aapa@ix.netcom.com.

Bunkers '97: September 24-26, Miami, FL. Contact: Carleen L. Kluss, International Marketing Strategies, 28 Southfield Ave.,

Stamford, CT 06902, tel: (203) 406-0106; fax: (203) 406-0110.

Seatrade North European Cruise and Ferry Conference: September 24-26, Amsterdam Rai, Amsterdam, The Netherlands.

Contact: Seatrade, Seatrade House, 42

North Station Rd., Colchester CO1 1RB, U.K., tel: +44 1206 545121; fax: +44 1206 545190.

ASNE Combat Systems Symposium: September 29-30, Kossiakoff Center, Applied Physics Laboratory, Johns Hopkins University, Laurel, MD.

Contact: American Society of Naval Engineers, 1452 Duke St., Alexandria, VA 22314-3458, tel: (703) 836-6727; fax: (703) 836-7491; e-mail: asnehq.asne@mcimail.com.

Argentina Oil & Gas Show: September 29-Oct 3, Buenos Aires, Argentina.

Contact: International Expositions, Inc., 1635 W. Alabama, Houston, TX 77006, tel: (713) 529-1616; fax: (713) 529-0936.

OCTOBER 1997

Container Asia '97: October 7-9, Shangri-La Hotel, Kuala Lumpur, Malaysia.

Contact: Paddy Payne, Baltic Conventions, Regal House, 70 London Rd., Twickenham TW1 3QS, U.K., tel: +44 181 892 2892; fax: +44 181 892 6767.

15th World Petroleum Congress: October 12-16, 1997, Beijing, China.

Contact: Chinese Organizing Committee Secretariat, c/o China National Petroleum Corporation, P.O. Box 766, Liu Pu Kang, Beijing 100724, China, tel: +86 10 209 5455/5446; fax: +86 10 209 544/5459.

9th International Conference On Computer Applications In Shipbuilding (ICCAS '97): October 13-17, Yokohama, Japan.

Contact: ICCAS Secretariat c/o Int'l Communications Specialists, Inc., Kashi Bldg., 2-14-9, Nihombashi, Chuo-ku, Tokyo 103, Japan, tel: +81 3 3272 7981; fax: +81 3 3273 2445; e-mail: iccas97@ics-inc.co.jp.

ASNE's 6th Fleet Maintenance Symposium: October 14-17, Town and Country Hotel, San Diego, Calif.

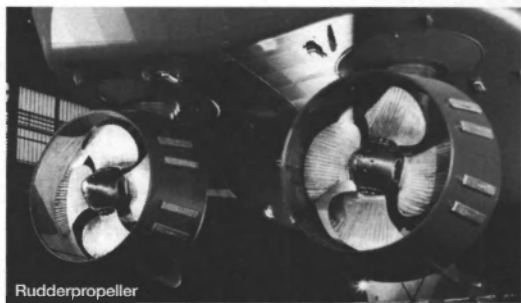
Contact: Rich Caccese, tel: (619) 556-2623, or Cdr. Chuck Goddard, tel: (619) 556-1627.

SNAME International Maritime Exposition: October 15-17, Westin Hotel, Ottawa, Ontario, Canada.

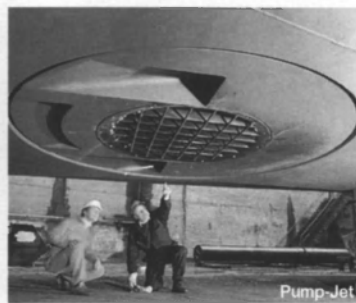
Contact: SNAME, 601 Pavonia Ave., Jersey City, N.J. 07306, tel: (201) 798-4800.

AWO 1997 Fall Convention and Board of Directors Meeting: October 16-17, The Four Seasons Olympic Hotel, Seattle, Wash.

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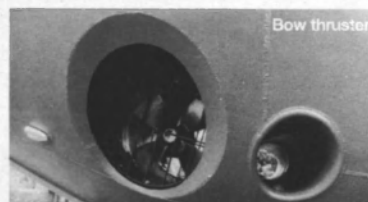
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CALENDAR

Contact: **Tina Gardner**, manager, Administrative & Member Services, American Waterways Operators, 1600 Wilson Blvd., Ste. #1000, Arlington, Va. 22209, tel: (703) 841-9300; fax: (703) 841-0389.

Women In Shipping: October 16-17, Washington, D.C.

Contact: **Carleen L. Kluss**, International Marketing Strategies, 28 Southfield Ave., Stamford, CT 06902, tel: (203) 406-0106; fax: (203) 406-0110.

1997 Permanent Int'l Association of Navigation Congresses (PIANC) National Conference: October 28-30, Hilton Hotel, Wilmington, N.C.

Contact: Office of U.S. Section, PIANC, 7701 Telegraph Rd., Alexandria, Va. 22315-3868, tel: (703) 428-6286; fax: (703) 428-8171.

Society of Accredited Marine Surveyors Annual Conference and Education Training Symposia: October 29-31, Downtown Riverfront Holiday Inn, St. Louis, Mo.

Contact: **Mary Stahler**, executive secretary, tel: (800) 344-9077; fax: (800) 388-3958.

NOVEMBER 1997

Seatrade Pacific Cruise Convention: November 3-5, Cairns, Australia.

Contact: The Seatrade Organisation, Seatrade House, 42 North Station Rd., Colchester CO1 1RB, U.K.

International Symposium On Shell & Spatial Structures: November 10-14, The Orchard Hotel, Singapore.

Contact: CI-Premier Pte. Ltd., 150 Orchard Rd. #07-14, Orchard Plaza, Singapore 238841, tel: +65 733 2922; fax: +65 235 3530.

ASNE Environmental Symposium: Environmental Stewardship, Ships and Shorelines: November 12-13, Virginia Beach Pavilion, Virginia Beach, VA.

Contact: American Society of Naval Engineers, 1452 Duke St., Alexandria, VA 22314-3458, tel: (703) 836-6727; fax: (703) 836-7491; e-mail: asnehq.asne@mcimail.com.

1997 Tri-Service Conference On Corrosion: November 17-21, Blockade Runner Hotel, Wrightsville Beach, N.C.

Contact: **David A. Shifler**, NSWC - Carderock Division, tel: (301) 227-5128.

Europort 97: November 18-22, Amsterdam, The Netherlands.

Contact: Amsterdam RAI, P.O. Box 77777,

NL-1070 MS Amsterdam, tel: +31 (0) 20 549 1212; fax: +31 (0) 20 644 5059; e-mail: press@rai.nl.

Fish Expo Seattle: November 20-22, Washington State Convention and Trade Center, Seattle, Wash.

Contact: Diversified Expositions, P.O. Box 7437, Portland, ME 04112-74338, tel:

(207) 842-5508; fax: (207) 842-5509.

ASNE Modeling, Simulation and Virtual Prototyping Conference II: November 24-25, Hyatt Regency, Crystal City, Arlington, Va.

Contact: American Society of Naval Engineers, 1452 Duke St., Alexandria, VA 22314-3458, tel: (703) 836-6727; fax:

(703) 836-7491; e-mail: asnehq.asne@mcimail.com.

2nd Asia-Pacific Conference On Shock & Impact Loads On Structures: November 25-27, Hotel Sofitel, Melbourne, Australia. Contact: CI-Premier Pte. Ltd., 150 Orchard Rd. #07-14, Orchard Plaza, Singapore 238841, tel: +65 733 2922; fax: +65 235



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Circle 316 on Reader Service Card

Oglebay Norton Buys Self-Unloaders

Oglebay Norton Co. has purchased 630-ft. (192-m), self-unloading vessels M/V *David Z. Norton* and M/V *Wolverine* from GATX Capital Corp. Prior to this deal, Oglebay was operating the vessels under lease agreements which were due to end in 1998 and

1999. The ships carry iron ore, coal and stone on the Great Lakes.

MSI To Develop Alaskan Simulation Training Program

MarineSafety International (MSI) has reportedly been selected by Alyeska Pipeline Co., British Petroleum and Keystone Shipping

Co. to develop and conduct a simulation and training program aimed at increasing the safety of tanker operations in Valdez and Prince William Sound, Alaska.

The program will involve all of the participants in the area's Vessel Escort and Response Plan (VERP) and will use specific vessel models, geographic databases and custom courseware.

MariSTEP Project Team Completes First Work Phase

A consortium of leading U.S. shipyards and CAD systems developers has successfully completed the initial phase of a three-year project which aims to produce the first ship model product translators. Prototype STEP (Standard for the Exchange of Product model data) translators will enable shipyards and designers to exchange detailed ship design information between dissimilar design systems. The project is funded by the Defense Advanced Research Projects Agency (DARPA) and falls under the Maritech program.

AmClyde Wins Wilmington Crane Contract

AmClyde Engineered Products, Inc. won a contract valued at approximately \$3.7 million from the North Carolina State Port Authority to supply one model LSB-10 gantry mounted crane to the Port of Wilmington by early 1998. The machine will feature a lifting capacity of 100 short tons on the main hook and 25 tons on the auxiliary hook.

Bouygues Offshore To Supply FPSO Topsides

Bouygues Offshore said that its joint venture with Fluor Daniel B.V. signed a turnkey contract with Bluewater for the supply of topsides for FPSO *Bleo Holm*. Bouygues Offshore subsidiary UiE Scotland Ltd. will carry out the \$75 million portion of the contract which calls for engineering, procurement, construction, installation and commissioning of the topsides.

Navy League Honors Lott

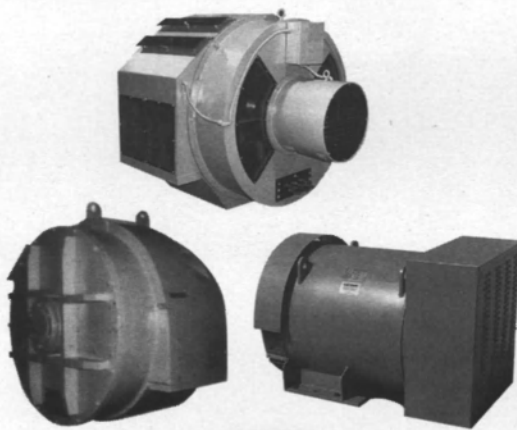
Senate Majority Leader **Trent Lott** (R-Miss.) was recently recognized for his role in ensuring the passage of the Maritime Security Act of 1996 by the Navy League, which presented him with its Vincent T. Hirsch Maritime Award.

"I'm very close to the Navy, and I appreciate and support a strong merchant fleet so essential to our security and peace around the world ... I will always support an American fleet," said **Lott** at a ceremony held in the Russell Senate Office Building, which was reportedly attended by 120 people.

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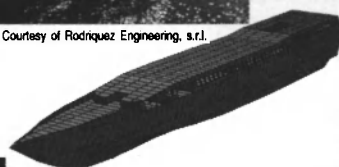
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NEW CONTRACTS RECEIVED

New Contracts

Orders are listed alphabetically, by vessel type. Publisher is not responsible for errors or omissions. For additional information on this, or other ship market information, contact: FERLISHIP, Paseo De San Francisco De Sales, 8, 28003 Madrid, Spain, tel: +341 441 4138; fax: +341 441 4138.

OWNER/OPERATOR	COUNTRY Ship Owner	SHIPYARD	COUNTRY Ship Builders	Velles Type	SUBTYPE	No	DWT	GT	DELIV.	PRICE (M\$)
SIMON MOKSTER SHIPPING	NORWAY	HELLESOY	NORWAY	AHTS	—	1	—	—	1998	24
TORM A/S	DENMARK	KVAERNER KLEVEN AS	NORWAY	AHTS	—	2	—	2,900	1999	50
FAIR WIND NAVIGATION	CYPRUS	SHIN KURUSHIMA	JAPAN	BULK CARRIER	—	1	29,000	—	10/98	15.2
KOBE SHIPPING	JAPAN	TSUNEISHI	JAPAN	BULK CARRIER	—	1	45,000	—	3/98	23.75
LADY SHIPPING CO.	—	ONOMICHI	JAPAN	BULK CARRIER	—	3	24,000	—	1998	45
MITSUBISHI ORE TRANSPORT	JAPAN	SASEBO	JAPAN	BULK CARRIER	—	1	72,000	—	1998	22.13
MIZUHO SANGYO	JAPAN	SHIN KURUSHIMA	JAPAN	BULK CARRIER	—	1	29,000	—	1998	—
NIPPON STEEL CORP.	JAPAN	MITSUMI	JAPAN	BULK CARRIER	—	1	229,400	—	1999	—
PAN OCEAN SHIPPING	KOREA	HYUNDAI	KOREA	BULK CARRIER	—	1	135,000	—	1999	—
PNSL	MALAYSIA	HYUNDAI	KOREA	BULK CARRIER	—	2	73,670	—	1999	54
TOHO KAIUN	JAPAN	SHIN KURUSHIMA	JAPAN	BULK CARRIER	—	1	23,000	—	1998	—
TOP GLORY	HONG KONG	OSHIRA SHIPBUILDING	JAPAN	BULK CARRIER	—	4	73,600	—	1999	150
TREEMA NAVIGATION	—	SHIN KURUSHIMA	JAPAN	BULK CARRIER	—	1	29,000	—	10/98	15.2
UNKNOWN	—	SUMITOMO	JAPAN	BULK CARRIER	—	1	73,500	—	3/99	27
ZELA SHIPPING	U.K.	HYUNDAI	KOREA	BULK CARRIER	—	2	170,000	—	1999	40
KASSIAN NAVIGATION AGENCY	GREECE	MITSUMI ZOSEN	JAPAN	BULK CARRIER	PANAMAX	2	—	—	3/99	—
SEAWAYAY NAVIGATION	TAIWAN	HITACHI ZOSEN	JAPAN	BULK CARRIER	PANAMAX	1	71,400	—	5/98	—
FOUQUET SACOP	FRANCE	AESA (BARRERAS)	SPAIN	CHEMICAL	—	1	8,300	—	1998	20.6
KNUTSEN OAS SHIPPING	NORWAY	NAVAL GIJON	SPAIN	CHEMICAL	—	3	30,000	—	2000	—
MARPETROL	SPAIN	UNION NAVAL DE LEVANTE	SPAIN	CHEMICAL CARRIER	—	2	16,000	—	6/99	58
MISC	MALAYSIA	HYUNDAI	KOREA	CHEMICAL CARRIER	—	4	30,000	—	99/2000	160
ANDERS UTILENS	GERMANY	AUKRA INDUSTRIER	NORWAY	CHEMICAL TANKER	—	1	16,150	—	1999	40
ERMEFER	SWITZERLAND	YSSEL-VLIET COMBINATIE	NETHERLANDS	CHEMICAL TANKER	—	1	10,000	—	11/98	32
VROON	NETHERLANDS	HALLA	KOREA	CHEMICAL TANKER	—	6	45,000	—	1999	213
FINAVAL	ITALY	SOC. ESERCIZIO	ITALY	CHEMICAL/ OIL	—	1	22,000	—	1998	48
SOCIEDAD NAVIERA ULTRAGAS	CHILE	SPLIT	CROATIA	CHEMICAL/ OIL	—	2	45,000	—	1998	70
GLOBAL CARRIERS	MALAYSIA	ATLANTIS	SINGAPORE	CHEM/PROD TANKER	—	6	7,000	—	—	108
JAMES FISHER & SONS	U.K.	VSEL	U.K.	CLEAN PROD TANKER	—	1	4,500	—	4/98	—
HANSA MARE	GERMANY	HYUNDAI	KOREA	CONTAINER	—	2	—	—	1998	—
HAPAG LLOYD	GERMANY	SAMSUNG	KOREA	CONTAINER	—	6	—	—	—	540
JINSUNG SHIPPING	JAPAN	SHIN KURUSHIMA	JAPAN	CONTAINER	—	2	10,000	—	5/98	40
THIEN & HEYENGA	GERMANY	MUTZELFELDTWERFT	GERMANY	CONTAINER	—	2	—	—	98/99	—
MALAYSIAN INT.SHPG.	MALAYSIA	HYUNDAI	KOREA	CRUDE OIL TANKER	—	2	105,400	—	1999	82
CARNIVAL CRUISE LINE	U.S.	FINCANTIERI	ITALY	CRUISE	—	1	—	101,353	2000	—
HANSA TREUHAND	GERMANY	GONDAN	SPAIN	CRUISE	—	1	—	—	5/99	23.6
GRANDI NAVI VELOCI	ITALY	NUOVI CANTIERI APUANIA	ITALY	CRUISE FERRY	—	1	7,150	40,000	1999	125.89
CONOCO	U.S.	SAMSUNG	KOREA	DRILLSHIP	—	1	—	—	1999	200
SOLVANG	NORWAY	MEYER WERFT	GERMANY	ETHYLENE TANKERS	—	2	11,500	—	98/99	80

**Thursday, October 16:
10 am to 5 pm**

**Friday, October 17:
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**Saturday, October 18:
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Renowned Oceanographer Jacques Cousteau Dies At 87

Legendary underwater explorer, filmmaker and environmentalist **Jacques-Yves Cousteau** died of a heart attack at age 87 in his Paris home on June 25. Captain **Cousteau**, whose name is synonymous with worldwide marine exploration, became a familiar figure through a film career which earned him three Oscars and three Cannes Film Festival awards. He was also well known for television series *The Undersea World of Jacques Cousteau*.

Calypso — a 400-ton mine sweeper which **Cousteau** converted into a floating laboratory outfitted with high-tech equipment — was the centerpiece for much of the captain's oceanographic odyssey. The vessel was also part of the world's first offshore oil survey before it sank off of Singapore last year. **Cousteau** was reportedly building *Calypso II* as a replacement.

Wearing the hats of environmentalist and inventor, **Cousteau** helped to start the first manned undersea colony, developed the Aqua-Lung and most recently created a one-person jet-propelled submarine. **Cousteau** aspired to solve the world's energy crisis by channeling the sea's tides and temperatures, and by extracting essential raw materials from the ocean floor which would feed the world's population.

At his last public appearance in January,



Jacques-Yves Cousteau is pictured at his last public appearance in January 1997, as he received the Oceanus Award for Environmental Service at the annual gathering of the recreational scuba diving industry at the Diving Equipment and Marketing Association (DEMA) Show in Orlando, Fla.

Cousteau received the Oceanus Award for Environmental Service at the Diving Equipment and Marketing Association (DEMA) show in Orlando, Fla. "The future of civilization depends on water," **Cousteau** commented at the event. "I beg you all to understand this."

Cousteau's memoirs, under the title *The Man, the Octopus and the Orchidea*, were scheduled to go on sale July 1. According to his widow **Francine Cousteau** will be buried in Bordeaux, his native region.

New Cummins-Powered Utility/Supply Boat for Sea Horse

In June, **Philip Plaisance** (who operates a fleet of 14 utility boats out of his Lockport, La.-based Sea Horse Marine Inc.) took delivery of 150-ft. (45.7-m) utility boat *Sea Horse* from Bollinger Shipyard. The boat, which is really a combination utility/supply vessel, is under charter to Marathon Oil to service three rigs, all of which are up to 100 miles offshore. The vessel has capacity for 90,000 gallons of potable water, 1,230-barrels of liquid mud, 53,000 gallons of diesel, and 21,700 gallons of methanol or jet fuel. The boat's primary function will be to carry up to 400 long tons of general freight. The vessel is able to serve as an emergency evacuation platform (EEP).

Sea Horse I is also equipped with a 2,000 gpm, eight-in. fire monitor with its pump powered by a Cummins NT-855 delivering 300 hp. This engine also serves a bowthruster to enhance maneuverability and station keeping capabilities when working under oil platform derricks.

The main engines on the 12-knot boat are a pair of Cummins KTA 38 MO V-12 diesels supplied by Cummins Mid-South. Each delivers 750 hp at 1,600 rpm. The engines drive through Karl Senner-supplied 5:1 Reintjes WAF-561 gears.


The vessel also features Cummins' system for onboard management of lube oil waste. "We have Cummins' fuel lube blender on the engines," explained Mr. **Plaisance**. "Every 250 hours we change oil on each engine and then blend the oil in with the fuel so that we can burn it as fuel."

Dry Bulk Rates Should Stay Up

U.K. shipbroking group Simpson Spence and Young (SSY) has forecast that dry bulk shipping markets will remain competitive over the summer and that rates will not fall as low as they did in the middle of 1996. The group attributed this optimism mainly to firm expectations for the trade in steam coal this year and next.

China's Fujian Province To Invest \$24 Billion In Port

Chinese authorities will reportedly invest \$24.1 billion to turn Meizhou Bay in the southeastern province of Fujian into a major port. There were no immediate indications of how the money would be raised.



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Maritime Reporter/Engineering News

NEW CONTRACTS RECEIVED

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NISSHO IWAI JAPANESE GOVT (FISHERIES)	JAPAN JAPAN	YAMANISHI SHIPBUILDING MIHO SHIPYARD	JAPAN JAPAN	FEEDERSHIP FISHERIES PROTECT	— —	1 1	— —	— —	12/97 1997	20 —
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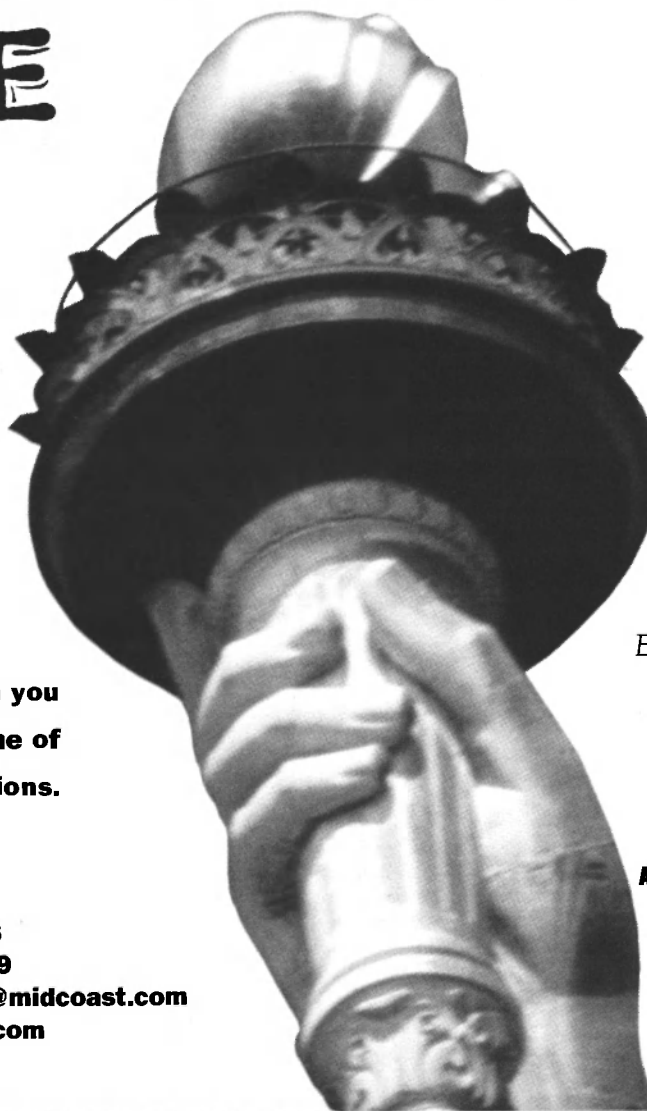
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High-Tech Watchtower Safeguards The Seas

A high-tech watchtower for use at sea has been developed in Britain to help maritime nations guard against intruders attempting to gain access to restricted offshore zones. The first Sea Sentinel, a giant buoy designed as a stable platform for surveillance systems, has been deployed 80 km offshore western Great Britain. Designed and built by Resource Technology Developments Ltd., the 170.6 ft. (52 m) high structure is expected to revolutionize offshore patrolling. The buoy automatically undertakes a range of tasks which until now relied upon the extensive use of vessels, aircraft and skilled personnel. Sea Sentinel's equipment includes IFF (identify friend or foe) transponders to spot intruding vessels within a 48-km radius, and high resolution optics and thermal-imaging cameras to identify vessels up to 22 km away.

Sonar devices can monitor the underwater environment, undertaking roles such as watching movements of submarines, record-



ing seismic information, measuring rates of coastal and sea-level erosion and checking sea defenses and structures. Above the surface, Sea Sentinel can reportedly initiate drug and contraband interdiction, keep watch on the skies for unauthorized incursion by aircraft, maintain protection of fisheries and ensure safe management of seaborne traffic in busy waterways.

Most of the buoy's structure is designed to remain underwater, tethered to a 350-ton con-

crete block on the seabed.

Sea Sentinel can reportedly survey approximately 1,930 sq. mi. and use advanced communications systems to give naval authorities a dynamic picture of activity in the region under surveillance.

The first Sea Sentinel will serve as a demonstration project and is backed by Britain's Department of Trade and Industry and the British Exclusive Economic Zone Export (BREEZE).

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Nautronix Wins Order

Nautronix Ltd. was awarded a contract from Factorias Vulcano of Vigo, Spain, to supply of hydrographic and oceanographic equipment.

The equipment will reportedly be used to outfit a pair of 164-ft. (50-m hydrographic/oceanographic vessels to be built by Factorias Vulcano for the Philippines National Mapping and Resource Information Authority.

TMM To Invest \$22 Million In Acapulco Port

Transportacion Maritima Mexicana (TMM) will invest \$22 million in the second phase of an improvement at the Port of Acapulco.

The first phase of the Acapulco port improvement, also awarded to TMM, was completed at a cost of \$7.4 million. The second phase of the project aims to upgrade the passenger terminal, as the Port is used mostly for tourism rather than shipping.

Daedong Wins Orders Worth \$184 Million

Daedong Shipbuilding won orders worth \$184 million from two European shipping companies. A \$130 million order for four 45,000-ton chemical carriers was reportedly awarded by Italy's D'Amico and a \$54 million order for two 72,700-ton bulk carriers came from Swiss shipping firm Suisse Atlantique.

New Malaysian Shipyard Proposed

PSC Industries Bhd has submitted a proposal to the Malaysian government to build a shipyard with a 200,000-dwt capacity. It is proposed that the new facility be owned by all of the shipyard companies in Malaysia. One aim for the shipyard would be to reportedly help reduce Malaysia's trade deficit.

OMI, Marine Transport Lines To Merge

OMI Corp. and Marine Transport Lines have reached an agreement in principle to merge.

The deal calls for OMI to acquire Marine Transport Lines, a private-

ly owned company specializing in marine and transportation services.

The company's respective boards have approved the merger in principle and the transaction is expected to be completed in January 1998.

Coming In August ... U.S. Ship & Boatbuilding Annual

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ShipRepair & Conversion 97

OLYMPIA 2 LONDON 4-5 NOVEMBER 1997

Recognised internationally as the industry's annual meeting place, the *Shiprepair & Conversion* Conference and Exhibition will be held at Olympia 2, London on November 4th and 5th. The current list of companies taking part in the exhibition is shown below. Companies who wish to join the exhibition should contact the Secretariat as soon as possible because exhibition space is now at a premium for the November event. Adjacent is the preliminary programme for the conference, which shows the high degree of owner/operator involvement on some of the key issues of the repair industry. The full programme is currently being finalised, and proposals for papers of special interest related to the sessions listed should be submitted to the Secretariat now. The Shiprepair & Conversion 97 Official Evening Reception on November 4 will be hosted by the A&P Group.

EXHIBITORS AS AT MAY 1997

A&P Group	Gemak Shipyard	Posford Duvivier
Al Mulla Marine	Gemsan-Net Shipyard	R.C.L. Profiles
Maintenance	GMD Shipyard	Saint John Shipbuilding
Allweiler Pumps	Goltens Oslo	San Francisco Drydock
Ameron International	Gryfia Shipyard	ScanMarine Group
Aqua Blast	Halifax Shipyard	Senior Thermal
Arno Dunkerque	Hamworthy Marine	Engineering
Asmar	Harland & Wolff Ship	Sesmarine
Astican	Repair	SHIPDOCK Amsterdam
Astilleros de Santander	Harris Pye Marine	Ship Repairers &
Astilleros Espanoles	Hellenic Shipyards	Shipbuilders
Atlantic Drydock	Hempel Marine Paints	Ship Services
Atlantic Marine	HJMMarine	Shipcare
Atlantis Shipyard	HongKong United	Sigma Coatings
Babcock International	Dockyards	Singapore Technical
(FMD)	Ian-Conrad Bergan	Shipbuilding & Engineer'g
Bazan	IMAC	Sobrena Shipyard
Belzona	J Kirkaldy & Sons	Southwest Marine
Blohm+Voss	K C Engineering	SpecTec
Braswell Shipyard	KaMeWa	Starweld
Britannia Heat Transfer	Keller Bryant	Stone Manganese Marine
British Flowplant	Kolfor Plant	Stork Services
Manufacturing	Kwang-Youn-Gi	Sub Marine Services
Brown Brothers	Engineering	Sword (Aberdeen)
Bureau Veritas	Lisnave	Temple Oil Seal Services
Calvey Marine	Lloyd Werft Bremerhaven	Terneuzen Port Services
Cambiaso Risso	Lloyd's Maritime	Testbank Ship Repair
Cammell Laird	Information Services	Thames Diesel Injection
CARENA	Lloyds Beal	Parts
Carlden Marine	MacGREGOR Group	The Skagerak Company
Cascade General	Malta Drydocks	Thomas Gunn Navigation
Cedervall & Soner	MAN B&W Diesel	Services
China Shipbuilding Corp	Marine Management	TradeWinds
(CSBC)	Systems	Turbo Technik
Chidambaram Shipcare	Marine Marketing	Turbo UK
Chris-Marine	International	Turkter Shipyard
CNIC	Metalock Industrial	Turner & Hickman
Conoship International	Services	Tuzla Shipyard
Diesel Marine International	MIL Davie	Tyne Dock Engineering
Dorbyl Marine	Mivan Marine	UESystems
Dry Air Technology	MMC (Europe)	UniThai Shipyard &
Dufferin Boiler Descaling &	Neorion Shipyards	Engineering
Cleaning	Nico International	Unitor
Electrocatalytic	Nicol and Andrew	Van Brink
Elgin Brown & Hamer	Niehuis & Van den Berg	Viktor Lenac Shipyard
EBE Nederland	Norshipco	VT Blast
Essex Governor Services	Odessos Shiprepair Yard	Wartsila NSD
Furmanite International	Öresundsvarvet	Western Shiprepair Yard
G C Ridley	Paul Hammelmann	Wilnot Marine Services
G & G Technical Services	Maschinenfabrik	Wiselow Commercial
Gdansk Shiprepair Yard	Penzance Dry Dock	Interiors
Remontowa	Pickup Bellows	World Shipping Services

CONFERENCE KEYNOTE SESSIONS

IACS Recommendations on Bulk Carrier Safety

Speakers:

Bob Somerville, President, American Bureau of Shipping

Robert Tustin, Chief Surveyor, Class Ship Structures Approval Group, Construction Services Department, Lloyd's Register

Iver Langley, Manager, Ship Management Department, Furness Withy (Shipping) Ltd

Panel Members:

James Bell, Permanent Secretary, IACS

Hamish Cubitt, Technical Director, Denholm Shipmanagement

Legal Workshop

Speakers: A panel of lawyers will

address the recurring key questions on legal aspects of the shiprepair industry. The panel will be headed by Alistair Mackie of Holman Fenwick & Willan

Shiprepair from the owning and management viewpoint

Speakers:

Vaughan Griffith, Manager, Vessel

Operations, Mobil Shipping

John Dunne, Technical Director,

Papachristidis

John Alcindor, Fleet Technical Manager, P&O

European Ferries

Acomarit - Speaker to be announced

Developments in the paints and corrosion industry

Waterjetting - is it making progress?

Hammelmann

The effect of the new SOLAS regulations

on ballast tanks and cargo holds

Ole Borring-Soerensen, J C Hempel Marine

Paints

Surveys

ISM Code - is sufficient progress being made?

Speaker to be announced

Marine Safety Agency

Speaker to be announced

Conversions

Proposals for papers concerning current or future conversions of special interest are invited for consideration by the Secretariat

Final Debate

Main theme - Technical Superintendents (are there sufficient numbers available with the necessary qualifications?)

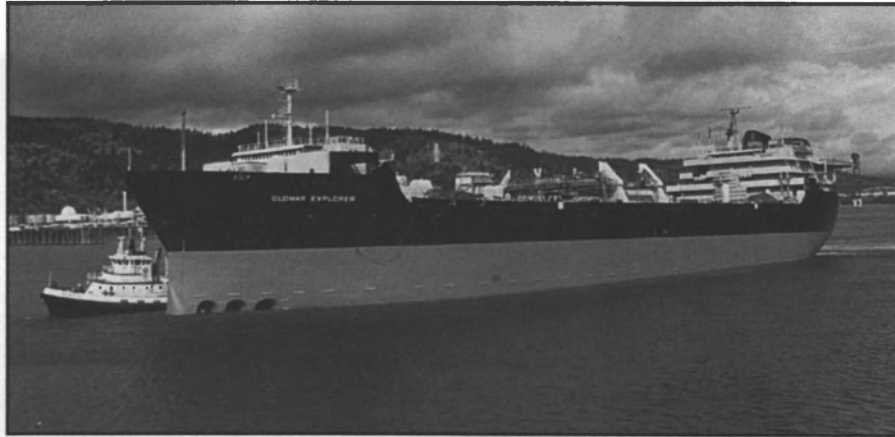
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Circle 330 on Reader Service Card

Salvage Ship *Glomar Explorer* Converted For Deepwater Drilling

Well-known salvage ship *Glomar Explorer* arrived at Cascade General in February after 20 years in lay-up. It departed in June after 135 days of round-the-clock work to fulfill its new mission as a state-of-the-art, deepwater drill-ship. The fast conversion was completed 15 days ahead of schedule and included a virtual doubling of specified work from the original contract terms.

Some five million pounds of steel were used in the primary modifications. The 619-ft. (188.7-m) ship was lifted and blocked at the bilges with a 12-ft. (3.7-m) clearance. In



a carefully orchestrated sequence, the retractable gates covering *Glomar Explorer's* 200-ft. (96.96-

m), moon pool were cut away, lowered and removed. Prefabricated, bottom modules were floated in,

flooded and inserted into place, leaving a 74 x 42-ft. (22.5 x 12.8-m) drilling pool.

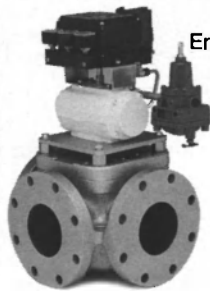
The ship was lifted again on standard 6-ft. (1.8-m) blocking and the new bottom was welded into place. Two bulkheads were erected above the new pool, the aft one carrying a 25-ton (22.7-m-ton) rack to support the 175-ton (158.7-m-ton) blow-out preventer. The new fore hold will contain stacks of riser pipe and related stores. To one side is a new moonpool, 16 x 19-ft. (4.9 x 5.8-m), specifically for Remote Operated Vehicle (ROV) deployment. The ROV will have the ability to inspect the seabed at great depths and will have its own service facilities and stowage area on deck.

The aft hold required extensive demolition and re-construction to support the loads imposed by ten 40 x 15-ft. (12.2 x 4.6-m) mud tanks; five, 7,500-psi mud pumps and a new electrical generator room housing four, EMD 645 16-cylinder AC generators, each weighing 40 tons (36.2 m tons). The electrical output, generated at 4,160 volts AC, was rectified to 440 DC via two new (SCR) control rooms. A powerful, 1,140-kW emergency generator was installed aft of the bridge and also demanded extensive structural modification. The ship's diesel-electric propulsion system — five Nordberg 16-cylinder AC generators turning six, 2,200-hp DC shaft motors — was overhauled and rebuilt where necessary. The twin propellers and shafts and all five 2,000-hp, shaft-driven thrusters were returned to top condition while the exterior received a five-year coatings system application before the ship was refloated.

The provision of ventilation to these numerous spaces necessitated retrofitting an entire system from the new deck down. Besides vent shafts, the deck plan called for 25 hatches, scuttles and davits for four Schat-Harding, 60 and 80-person, self-righting lifeboats. Access to the helicopter deck was strengthened to carry a forklift, and under-deck reinforcement was added to support four Seatrax cranes, with boom lengths of 90 to 110 ft. (27.4 to 33.5 m).

"The *Glomar* conversion has been the largest, most complex project in the history of this yard," said

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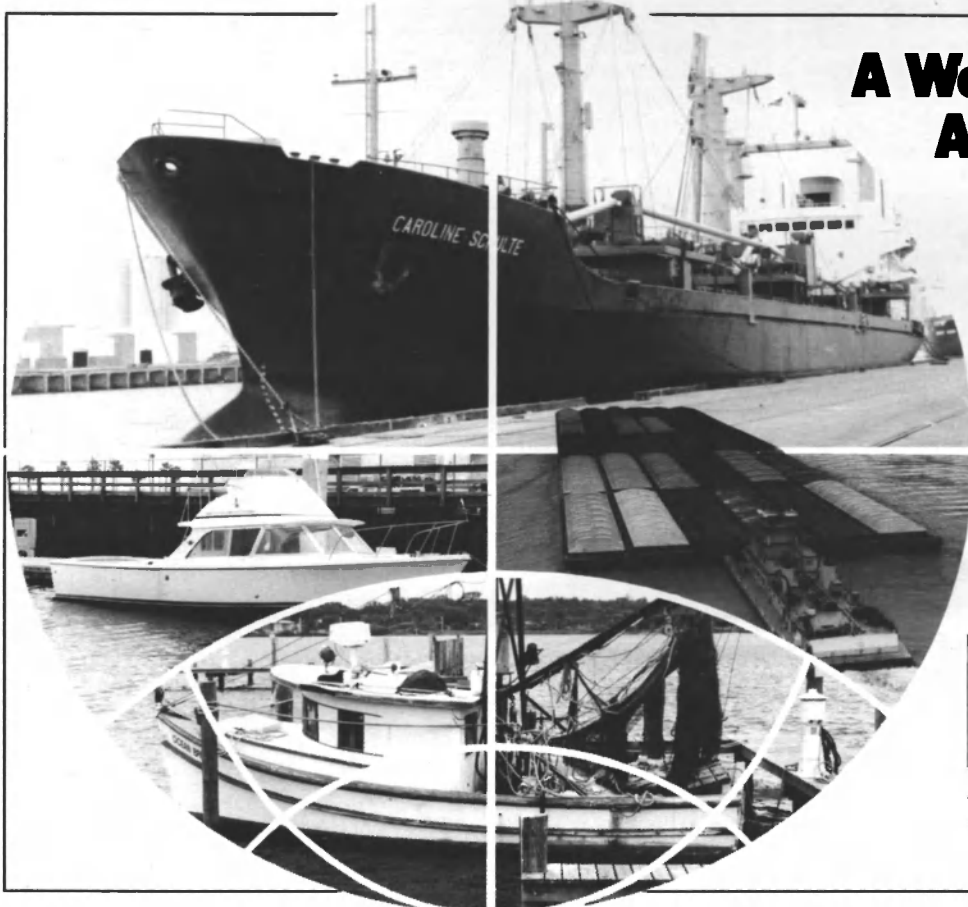
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Cascade General operates Portland Shipyard, the largest ship repair and industrial facility on the U.S. West Coast. It provides full-service repairs and conversions for tankers, cruise ships, bulk carriers, containerships, government vessels, tugs, barges and workboats. Cascade General's

Portland facility includes a 96-acre yard, more than 7,000 ft. (2,133 m) of repair berths and three floating drydocks — including Dry Dock 4, reportedly the largest in the Americas.

For more information on
Cascade General
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Cascade General Executive Vice President **Andrew Rowe**. "It has enabled us to demonstrate the full potential of Portland Shipyard and Cascade General as major players in the U.S. conversion market."

Integral to its new role of deepwater oil prospecting, *Glomar Explorer* needed the capability to hold position of +10 ft. (+3.04 m) over a drill site up to 7,500 ft. (2,286 m) deep. This necessitated additional thrusting capability in the form of four new 3,000 hp azimuthing units operating in 50 x 12.5 ft. (15.2 x 3.8 m) vertical tubes.

These electric thrusters can be raised and inspected at deck level via a vertical rail system, built to machine-level tolerances.

The total power of the nine thrusters is 22,000 hp, greater than the ship's main propellers. All 11 screws are connected to the vessel's new, dynamic positioning system. Six 18-in. (45.7-cm) tubes projecting from the main deck to the bottom have been installed to carry the hydrophone array. The bridge has been completely redesigned to meet these precise, navigational needs.

"In many ways, the complex demands of this job are greater than with new construction," said **Alan Jones**, Cascade General project manager and a 25-year veteran with the yard. "The *Glomar* contract has made full use of all our assets: the drydocks and cranes, workshops and workforce. We've also had great support from local specialists/subcontractors."

"We have overcome numerous challenges, from containing the lead paint removed from the houses to removing the original, 150-ton, heavy-lift girders over the pool," said Ship Superintendent **Jim Mattix**. "Our goal has been to upgrade the existing systems to full ABS standards to match all the new equipment we've added."

After load testing of the engines and sea trials, *Glomar Explorer* was delivered under its own power to the Gulf Coast via Cape Horn, where it will be fitted out and commenced work under a five-year, exploration contract. According to



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Circle 328 on Reader Service Card

(Continued from page 42)

consumption.

The crankshaft is equipped with large crank pins and journals in order to achieve moderate bearing pressures and thick oil films. On the engine block, special attention is paid to the stiffness due to the high power density required in a high-speed engine. For example, the outside location of the camshaft compartment, and the fact that the camshaft bearings are machined directly in the engine block, are design features that ensure a stiff box structure.

Fuel injection equipment consists of individual injection pumps with integrated fuel lines. To create optimization flexibility, the injection equipment is designed for 2000 bar injection pressure

and is supported by a generously dimensioned camshaft.

The new ABB TPS series of turbochargers was designed simultaneously with the engine, offering high efficiencies and high pressure ratios. The compact Holset HX turbocharger options can be used, depending on the application.

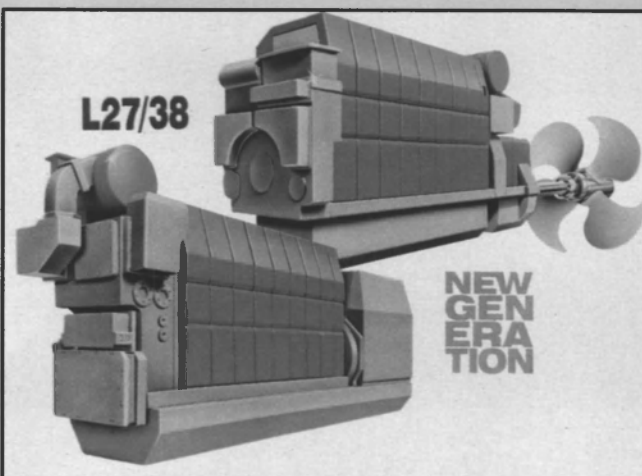
For more information from Wärtsilä
Circle 174 on Reader Service Card

Wärtsilä 170 Main Technical Data

Cylinder bore170
Piston stroke200
Speed1,500 to 1,800 rpm
Swept volume4.54 l/cyl.
Mean effective pressure19.1 - 20.2 bar
Piston speed10 -12 m/s
Fuel specificationMarine diesel oil,
.....ISO 8217, F-DMX to F-DMC

MAN B&W Introduces New Medium-Speed Design

A new medium-speed engine from MAN B&W Diesel's Holeby Genset division and Alpha Propulsion division is the result of the engine maker's analyses of trends in shipping and shipbuilding, as well as the challenges presented by low crewing levels, machinery simplicity, reliability and overall economy.



The L27/38 design, to be tested this year, will

cover genset and propulsive power demands from 1,500 to 2,880 kW at 720 to 800 rpm, with five, six, seven, eight and nine-cylinder inline models.

The 270-mm bore/380-mm stroke design inherits the principles applied to the company's very successful, smaller L16/24 genset engine. The L27/38 series will exploit these proven concepts on a larger scale, and will seek to provide: high reliability; lower costs (for installation and operation); compact dimensions; and modular maintenance.

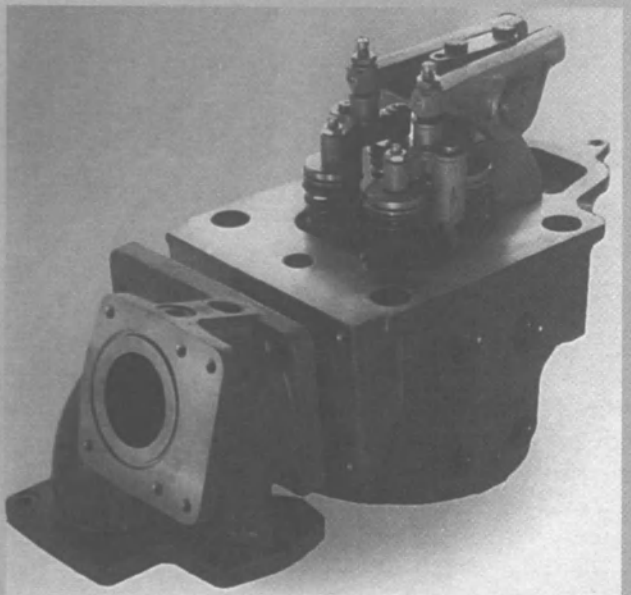
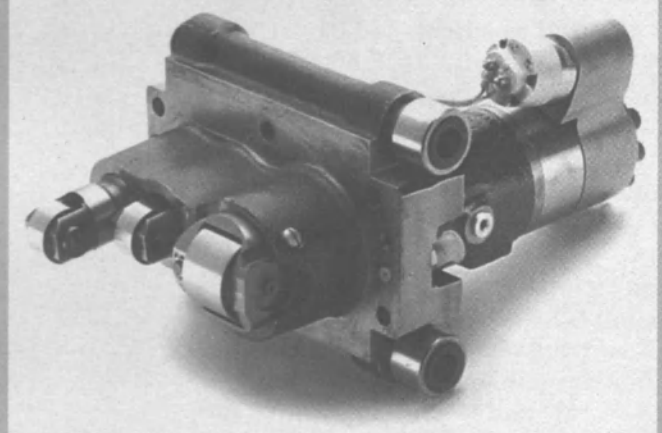
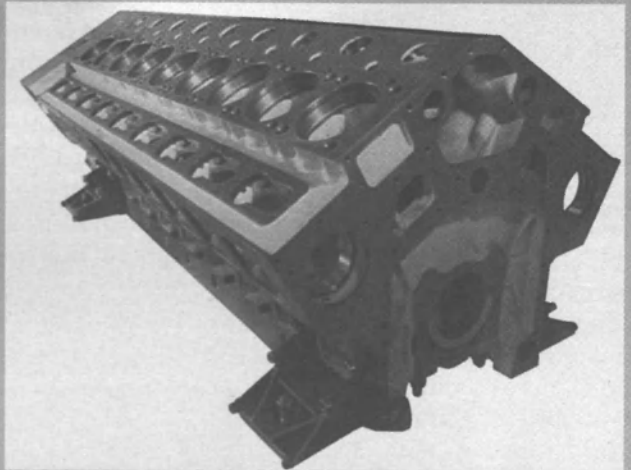
A genset version of the L27/38 engine will be configured to satisfy the electrical demands of larger tonnage, such as container ships and passenger vessels; and the propulsion plant version is intended to attract interest from owners of small to medium-sized cargo ships, ferries, fishing vessels and specialized vessels. In designing the engine, the trend towards simplicity is clearly evident. The engine is made of about 40 percent fewer parts than its predecessor of a similar bore size.

For more information from MAN B&W
Circle 173 on Reader Service Card

MAN B&W L27/38 Main Data

Bore270 mm
Stroke380 mm

	Genset 60 Hz	Genset 50 Hz	Propulsion
Cylinders (inline)	5,6,7,8,9	—	6,7,8
Output range (kW)	1,500-2,700	1,600-2,880	2,040-2,720
Speed (rpm)	720	750	800
Mep (bar)	23	23.5	23.5
Cm (m/s)	9.1	9.5	10.1
Output/cyl. (kW)	300	320	340



DEVELOPMENT OF THE NEW Wärtsilä 170

TOP: The Wärtsilä 170 engine block.

MIDDLE: The Wärtsilä 170 injection pump is located in a multi-housing with integrated fuel lines and valve tappets.

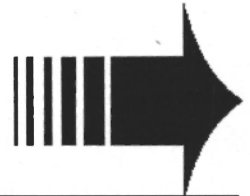
BOTTOM: The Wärtsilä 170 four-bolt cylinder head mates to a multi-duct conveying air, exhaust gas and water to and from the cylinder head. The multi-duct also carries the exhaust system.

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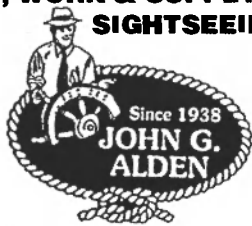
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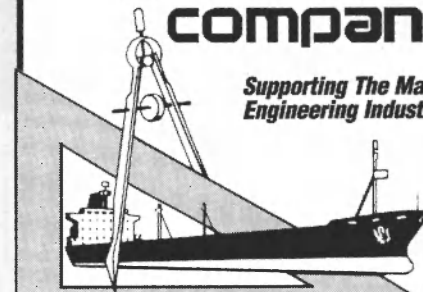
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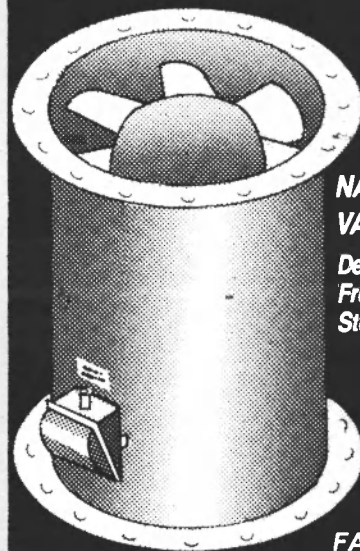
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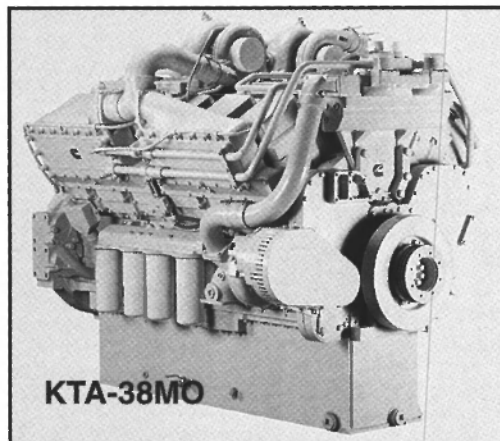
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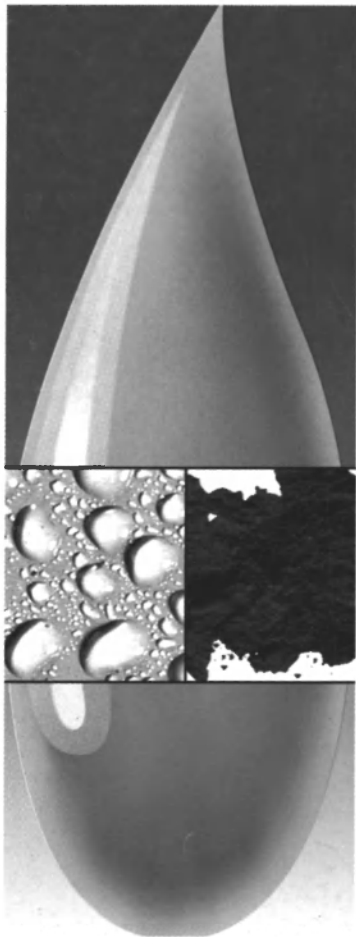
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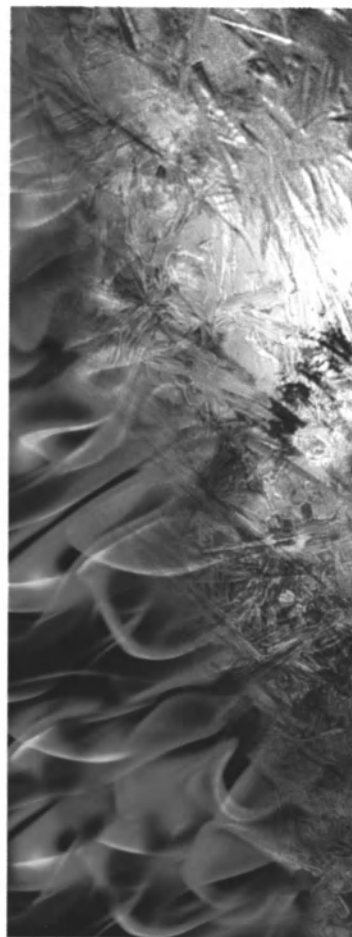
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