

**MARITIME
REPORTER**
AND
ENGINEERING NEWS

Ship & Boatbuilding Technology

Ship Repair Down Where?

HOT MARKET

**Power Barge, FPSO deals
drive Gulf Coast business**

NEW DESIGN

**Canada Steamship orders new
self-unloading cargo ship**

FAR EAST UPDATE

China woos German owner

EUROPEAN UPDATE

**Howard Smith Towage & Salvage
in midst of \$27M expansion**

Deck Machinery & Cargo Handling Equipment Review • Coatings & Corrosion Control Review

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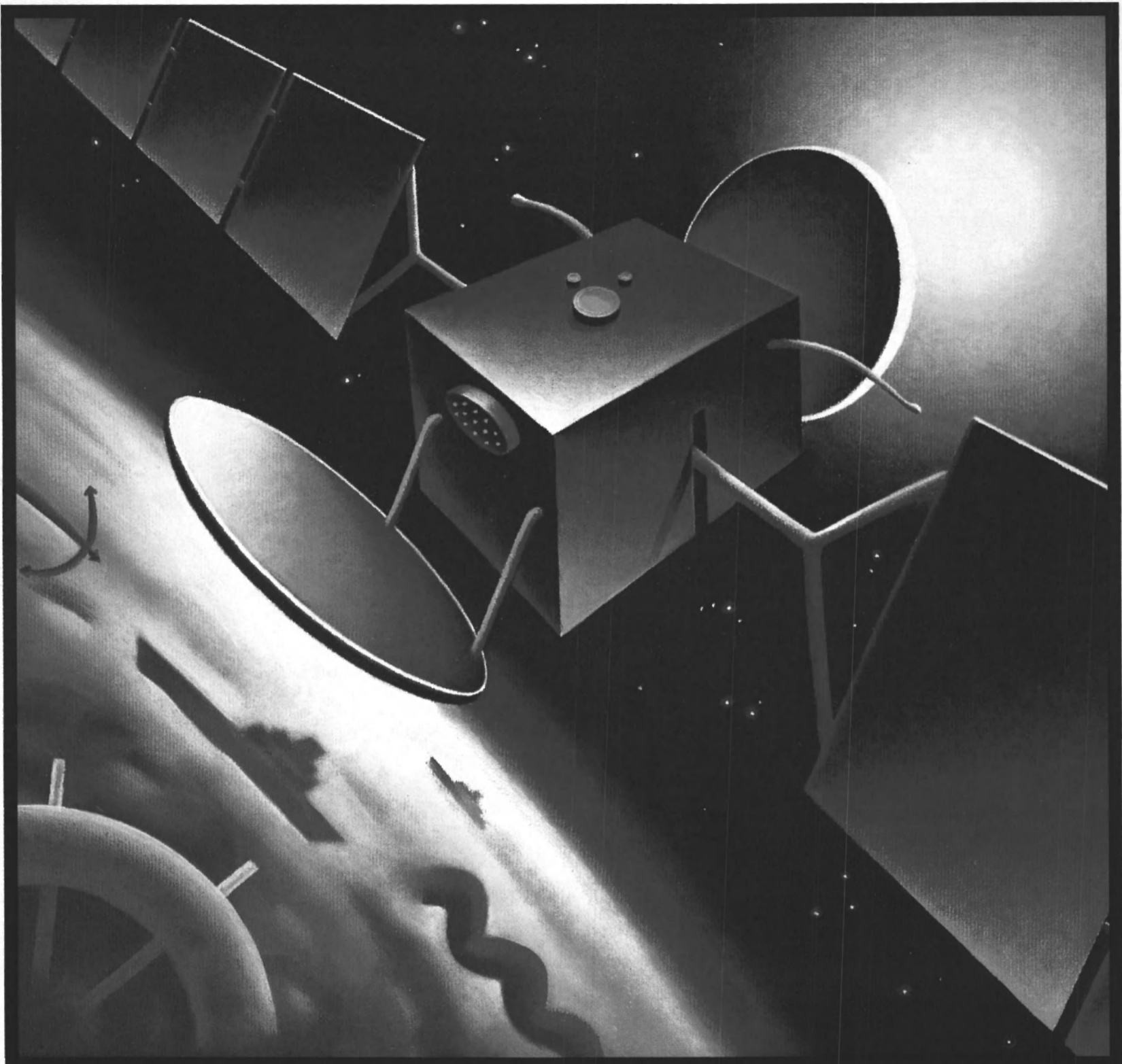
Heating: Strip heaters located on duct work.

Tankage (approx.): 8,000 gallons fuel 13,000 gallons fresh water, 11,000 gallons sewage, 100 gallons lube oil.



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On The Cover

Pictured on the cover is a photo of an underwater propeller repair performed by Lips Subsea. The Lips Subsea team, led by Kimo Mackey, specializes in this service and is on call around the world to get vessels fixed and underway quickly. See the story on Lips Undersea in the Ship & Boatbuilding Technology section, which begins on page 27.

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Fincantieri Lands \$600M Holland America Dual Ship Order

Carnival Corporation announced that it had reached an agreement with Fincantieri Cantieri Navali Italiani, S.p.A. for the construction of two cruise ships for its Holland America Line (HAL) subsidiary at a combined cost of approximately \$600 million. Both ships are expected for delivery in 1999, one early and the other late in the year. Estimated at 65,000 gt with a capacity of 1,440 passen-

gers, the two new vessels will reportedly be 20 percent larger than HAL's Statendam class ships, which have been introduced over the last three years. With a maximum speed of 23 knots, the vessels will have higher than average speed but will be slower than the 25-knot of *Rotterdam VI*, currently under construction at Fincantieri. **Kirk Lanterman**, HAL's president and CEO pointed

out that the two newest ships represent a new generation for Holland America and are not a continuation of the Rotterdam class vessel. These two newest ships will operate on a variety of Holland America's popular itineraries including Alaska, Europe, Caribbean and Panama Canal voyages. "The company is extremely pleased with Holland America Line's performance. It

has undergone tremendous growth since our acquisition in 1989," said **Micky Arison**, chairman and CEO of Carnival Corporation.

Reinauer Deploys Ground Guard Technology

Reinauer Transportation will install an advanced positioning and vessel grounding prevention system and optional black box radar target and voice recorder manufactured by Electronic Marine Systems of Rahway, N.J. This technology places an "extra watchstander on board," which alerts navigators to charted rocks, historical grounding sites and depths lower than those preset by the captain. This technology was originally developed for the tanker trade operating in Valdez, Ark.

Mid-Coast Marine To Build Freezer Longliner

Jensen Maritime Consultants, Inc. (JMC) has completed the design for a new generation 59 x 24-ft. (18 x 7.3 m) freezer longliner. The Seattle-based naval architecture firm has designed the new vessel for **Jim and Rhonda Hubbard** of Seward, Alaska. Mid-Coast Marine Oregon will build the vessel at the company's Coos Bay, Ore., shipyard. Construction began in June, and delivery is scheduled for January 1997.

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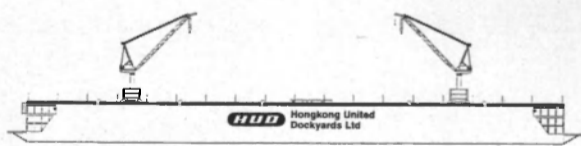


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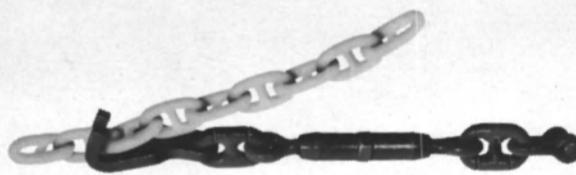
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NETEC Involved In Barge Project

NETEC, Inc. (formerly known as New England Trawler Equipment Company) is involved in a project for Lafarge Cement Corporation's new barge *Integrity*. For this project, NETEC developed a constant tension mooring winch which is reportedly capable of maintaining the barge's dockside position as part of a highly automated, self-trimming, self-loading/unloading barge. Other projects include a series of nine diesel-hydraulic winches for MarAd; diesel and hydraulic towing and escort winches for *Kinsman Condor*, *Kinsman Eagle* and *Kinsman Venture*, all owned by Hvide Marine; and windlasses, capstans, power units and mooring winches for barges owned by Bouchard Transportation Co., Moran Transportation Co. and Allied Towing Company.

For more information on NETEC, Inc.
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FOR MORE INFORMATION on the latest news from Deck Machinery Manufacturers, please see the MR/EN Deck Machinery & Cargo Handling Equipment review, which starts on page 38.

Lisnave Wins Multi-Million\$ Contract

As the result of an accident which occurred during discharging operation in May in Rio de Janeiro, Brazil, the 46,614-dwt product carrier *Kriti Amber* required extensive steelwork renewal and other repairs.

Among competition to win the repair contract from yards in Brazil and Greece, Portugal's Lisnave eventually won the contract following lengthy discussions. The major repairs comprise replacement of more than 700 tons of steel in double bottom tanks, bulkheads in cargo tanks numbers 3c, 4c and 5c, and on the main deck.

Damaged equipment in all of the areas is to be replaced, which also involves repairing/replacing the hydraulic control system and piping system in the cargo tanks — involving pipes of up to 400 mm in diameter and totaling 20,000 m in length — and replacing 14,000 m of electrical cable. Blasting and coating with special paints will encompass 10,000-sq.-m.

Kriti Amber was built in 1995 at Black Sea Shipyards, Ukraine, and is owned by Varnima Corp. International. It is classed by Lloyd's Register.

For more information on Lisnave
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Boatrac's To Outfit MEMCO Fleet

Boatrac's Inc. has signed a contract with Marine Equipment Management Co. (MEMCO) to equip its entire fleet with Boatrac's satellite-based marine communications and tracking systems.

MEMCO is a rapidly growing, fully integrated marine transportation company.

It decided to equip its fleet with the Boatrac's system to integrate data collection and communications between corporate offices and boats.

With the new capability, MEMCO has the ability to communicate from the corporate offices in Cape Girardeau, Mo., or Belle Chasse, La., to any or all of its boats.

MEMCO's vessels operate on the Upper and Lower Mississippi River, the Ohio River, the Tennessee River, the Tennessee-Tombigbee Waterway, the Arkansas River, the Yazoo River, and the Gulf Intracoastal Waterway.

MEMCO's customers will benefit by receiving Estimated Time of Arrival (ETA), hourly position updates and other necessary information on a more timely basis.

"We are excited to welcome MEMCO as our newest customer," said **Steve Picazio**, vice president, Regional Sales, Boatrac's.

Mobil Orders Two Double Hull Supertankers

Mobil Shipping and Transportation Co. (MOSAT) signed a contract with Sumitomo Heavy Industries of Japan for two additional double hull VLCCs to service its global petroleum requirements.

Sumitomo will reportedly build the first of the vessels, which is to

be delivered in October 1998, and it reportedly consigned construction of the second vessel to Ishikawajima-Harima Heavy Industries Co. Ltd. (IHI).

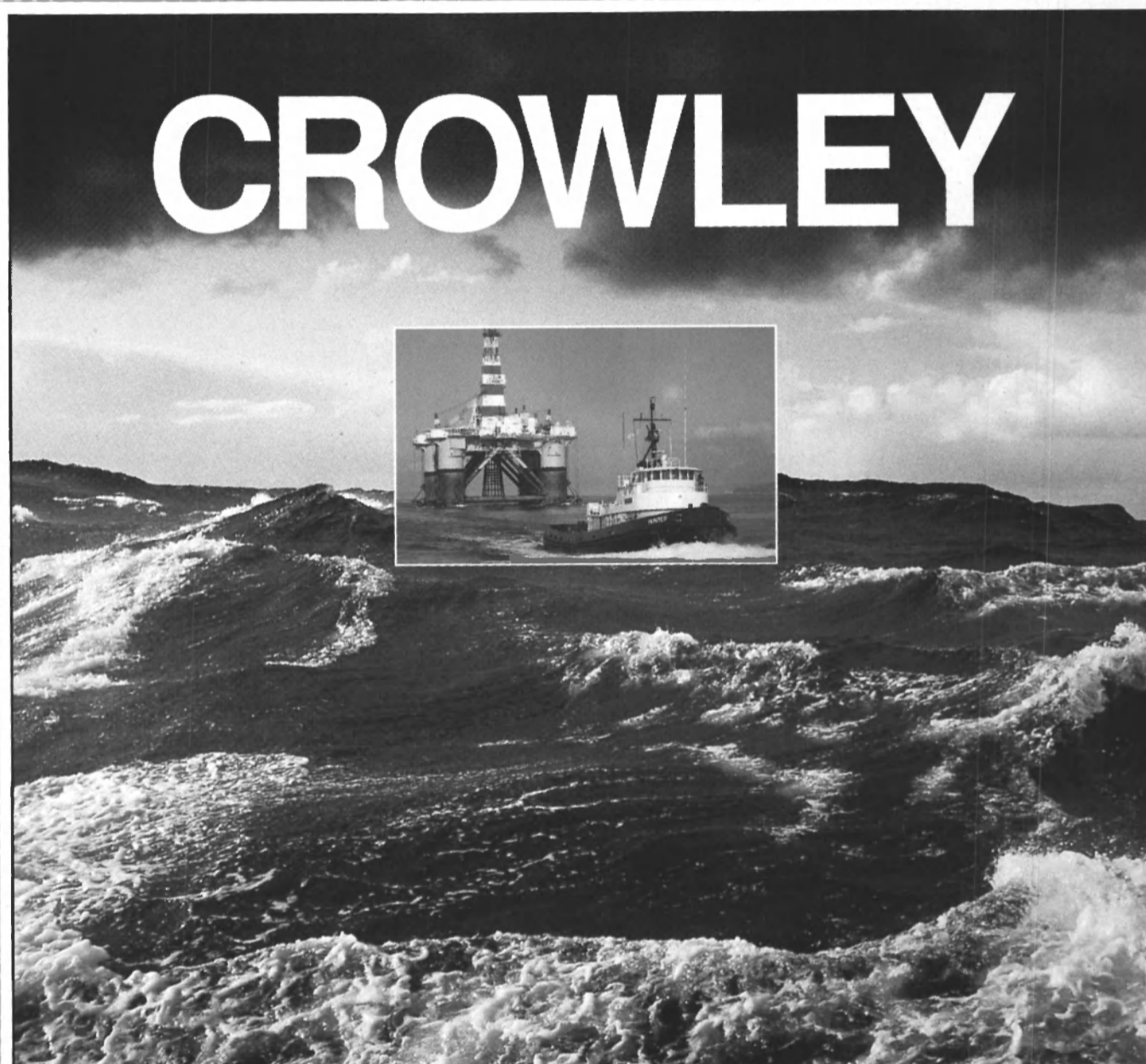
This will bring to four the number of double hull VLCCs in Mobil's fleet.

The 280,000-dwt ships will be similar in size and design to Mobil's two other double hull VLCCs, *Eagle* and *Raven*.

A new design feature in these ships will be the routing of cargo

piping through cargo tanks rather than over the deck. "This design change adds a greater measure of pollution prevention than existing systems," said **Gerhard Kurz**, president of MOSAT. "It reduces the potential for spillage, decreases maintenance and gives clear access to the deck in case of an emergency.

The ships will measure 1,100 ft. (335 m) long, 190 ft. (58 m) wide and will carry a cargo of 2.2 million barrels of crude oil.



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EDITOR'S NOTE

This month's ship & boat-building technology focus differs from similarly themed offerings contained within MR/EN pages in the past. While the editorial content includes articles and news on today's "next-generation" equipment and systems, the most compelling pieces focus on Newport News Shipbuilding's (NNS) Mike Keenan and Lips Subsea's Kimo Mackey. These men clearly illustrate two things: that technology is only as good as the people using it; and that attitude is priceless.



On a trip to NNS to check the progress of the first Double Eagle tanker, I found a company which is implementing the physical and procedural measures needed to ensure its long-term prosperity. In essence, NNS is both talking the talk AND walking the walk. Mr. Keenan, director of the yard's high-profile product tanker program, is the impetus for fostering a positive attitude among his workers. He is employing all of his resources — 30 years of experience, a skilled workforce and a large investment in new equipment — to reduce the build-time of the Double Eagle tanker from 15 months to "seven months, three weeks." (See story on page 58)

Mr. Mackey, the charismatic manager of Lips Subsea, is another individual with a unique slant on the use of technology in the maritime industry. Mr. Mackey's team (pictured on the cover, page 4 and featured on page 34) specializes in underwater propeller repair. The group does not employ a "cut and run" strategy; rather, it has developed the technology and trained its crews to quickly repair propellers — including the straightening of major bends.

Assistant Editor Nina Miller kicks off the technology section with a look at the resurgent Gulf of Mexico offshore market. Technology is playing a large role in the continued confidence in the offshore market around the world, as companies can now find and develop deeper, more remote fields. Ms. Miller's report details oil majors' and builders' bullish views on the near and long-term growth potential of the market.

Finally, reception of our online edition — Marinelink.com — has been phenomenal. The site contains full-text versions of previous editions, which can be easily searched via a "keyword search." It's a powerful tool for those in need of information on a particular topic or ship type. [Marinelink](http://Marinelink.com) also offers a daily news update, packed with choice maritime-related happenings from around the globe. Stay tuned as the site develops, as there are many additional products and services scheduled to be up and running soon.

Gregory R. Trauthwein

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The Outlook for Oil Shipping to 2000

Rising oil production, increased use of FPSOs drive shuttle tanker demand

A combination of new discoveries,

cost reductions, improved technology and fast track development solutions such as Floating Production Storage and Offloading (FPSO) have extended the commercial life of the North Sea as an

oil producing area.

The North Sea, consequently, continues to defy expectations with spectacular growth in oil production, and predictions forecast a boom to the end of the decade.

In its latest report, *The North Sea Tanker Market: The Outlook for Oil Shipping to 2000*, Drewry Shipping Consultants looks at how higher North Sea output has affected oil shipping, and examines the implications for the tanker market.

Drewry expects that shuttle tankers will be carrying 64 percent more North Sea crude in 2000 as compared with 1995 levels, which equates to an extra 1.5 million barrels per day.

The growing demand for shuttle tankers from offshore loading oil-fields in the North Sea is a result not only of the rising level of oil production, but also of the increasing use of FPSO developments, the growing significance of heavy crudes in the North Sea and the close proximity of much of Europe's refining capacity.

The main growth areas for offshore loading will be in the Norwegian Sea, West of Shetland, and the central area of the North Sea. The increased demand in these areas will more than make up for the decline in demand for shuttle tankers from the older, more established fields. To accommodate the projected increases in demand, the North Sea shuttle tanker fleet will need to expand.

Effect On Conventional Tanker Trading Patterns

All sectors in the North Sea tanker market have registered spectacular growth in the 1990s in terms of the volume of crude cargo traded.

However, the switching of employment of some VLCCs, from long-haul trades out of the Arabian Gulf, to work in the North Sea, has meant that growth in North Sea oil production has not always been translated into significantly higher freight rates for the North Sea's traditional aframax and suezmax tankers.

The rising level of oil production has resulted in a commensurate growth in tanker demand in Northwest Europe that has had a knock on the effect of tanker trading patterns worldwide. The previously highly international tanker market is breaking down into a series of regional markets.

In particular, North Sea output, coupled with other non-OPEC production advances, has helped limit the long expected increase in the reliance on OPEC oil.

Short and medium haul supplies from the North Sea (along with West Africa and Latin America) have increasingly displaced long haul cargoes from the Arabian Gulf in the European and American markets. Crude cargoes from the Arabian Gulf increasingly go east to Southeast Asia and the Far East, rather than worldwide.

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VLCCs, while smaller tankers more suited to regional trades prosper. With oil being transported shorter distances, rising world oil production and demand is not being translated into increased tanker demand in ton-mile terms.

North Sea Freight Volumes Up

According to Drewry, the volume of dirty spot chartering activity in Northwest Europe has grown substantially in the last four years, consistently outperforming the rate of growth in total world chartering activity. From just under 10 percent of total world chartering activity in 1992, dirty spot chartering in Northwest Europe accounted for more than 15 percent in 1995.

The increase in the volume of crude traded on the spot market out of Northwest Europe has not, however, been reflected by a comparable rise in freight rates. The poor level of freight rates achieved is a reflection of the continuing overcapacity in the world tanker fleet.

North Sea's International Significance

This latest Drewry report looks at North Sea in context of the world oil market, noting that the area's dominance is disproportionate to its geographical size. The cutting edge offshore technologies that make the North Sea such a dynamic oil province are now being put into practice worldwide.

The structure of the oil industry in the North Sea is studied with an in-depth look at the production and transport infrastructure, including oil production forecasts for each oil field to 2000.

An analysis of the trading patterns in the North Sea tanker market, based on a comprehensive database of tanker movements, is included in the report. Fixture activity, load and discharge ports, trade routes, vessel characteristics and the owners and charterers operating in the North Sea are all considered.

The North Sea Tanker Market: The Outlook for Oil Shipping to 2000, is published by Drewry Shipping Consultants. Contact Drewry at: 11 Heron Quay, London E14 4JF; tel: +44 171-5380191; fax: +44 171-9879396.

RCCL Awarded DNV's Safety & Environmental Protection Certificate

Royal Caribbean Cruises Ltd. became the first cruise line to be awarded the Safety and Environmental Protection (SEP) certification issued by ship classification society Det Norske Veritas (DNV). SEP is a voluntary program designed to enhance safety and environmental protection procedures above those required by law and regulation. The certifica-

tion entitles the company to add the letters SEP to its classification certificates. Royal Caribbean's corporate offices were certified as was the 2,354-passenger cruise ship *Majesty of the Seas*. Certification for the 1,600-passenger *Nordic Empress* is expected to be completed on June 28, and the remainder of Royal Caribbean's 10 ships will follow suit later in the year.

DNV developed the Safety and Environmental Protection regula-

tions to prevent human injury and loss of life and to avoid damage to the environment and private property. Although there is no requirement to adopt SEP standards, a year ago Royal Caribbean voluntarily began the process of enhancing the safety and environmental procedures on its fleet and in its offices to qualify for certification. The effort cost well into seven figures and culminated in a series of meticulous examinations by DNV. Under the internationally recog-

nized Safety of Life at Sea (SOLAS) regulations, all passenger ships are required to comply with specific safety regulations (called International Safety Management Code or ISM) by 1998. Royal Caribbean adopted the ISM code in 1994. The Safety and Environmental Protection certification awarded to Royal Caribbean by DNV goes beyond those requirements and encompasses enhanced procedures and compliance requirements.

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Wärtsilä Offers Now Low NOx Combustion On Vasa 32

The Vasa 32 has been a popular engine throughout its 18 years on the market, and manufacturer Wärtsilä Diesel has reportedly lowered the unit's NOx emission.

Recent requirements from the marine market concern limitation of NOx emissions. The NOx emission limitation proposed by the IMO for diesel engines onboard ships will, during the first phase, be related to engine speed. The proposed NOx emission level has been reduced 30 percent from the existing level recorded in a survey of existing ships in operation.

Wärtsilä reports that its low NOx combustion technology is an alternative to a solution which simply cuts NOx by retarding fuel injection, thus increasing the thermal load and substantially increasing fuel consumption.

The low NOx solution depends on many factors working together, but includes:

- A new piston has been developed for higher combustion pressure, because the maximum firing pressure has

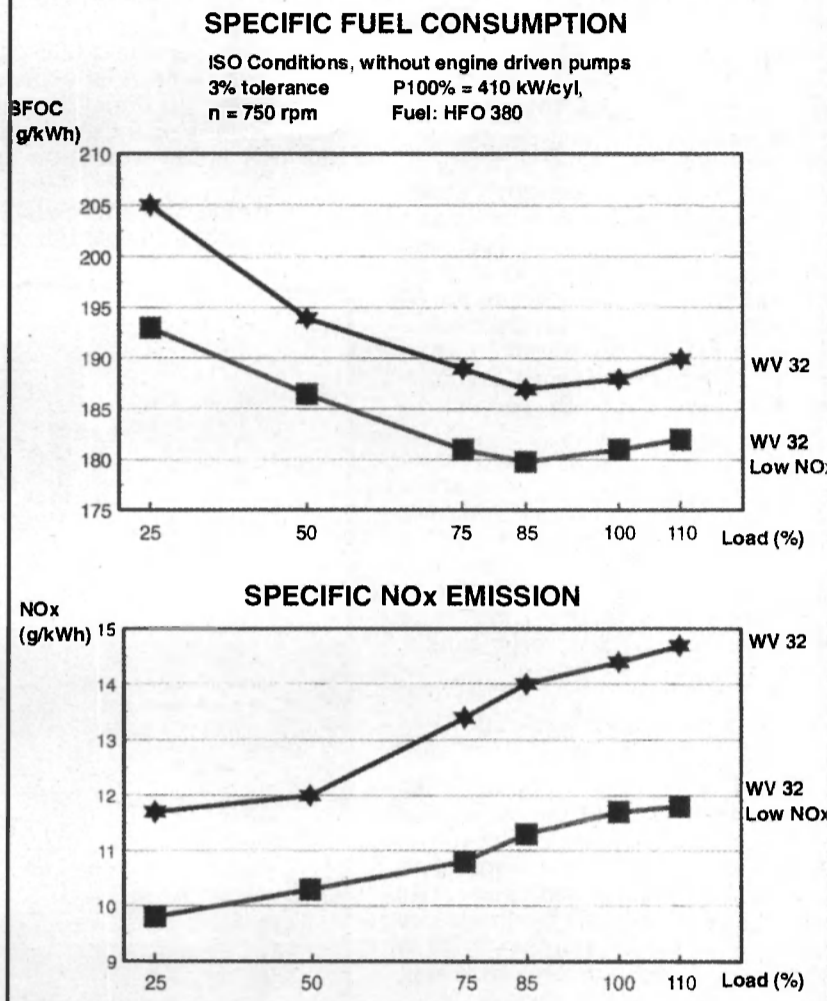
been increased by 10 bar to 165 bar. The higher maximum pressure is needed to handle the increased compression pressure and to provide greater thermal efficiency. The piston is a composite consisting of a modular cast iron skirt and steel crown.

- The stiff, bore-cooled liner is equipped with an anti-polishing ring in the upper end to eliminate the risk of bore polishing.

- As a consequence of the increased cylinder pressure, the connecting rod was changed from a diagonally stepped, two-piece solution to a fully machined, three-piece design with a horizontally split, big-end bearing. The change provides greater safety at increased load and eliminates the need to interfere with the big end bearing assembly when overhauling the piston. The disadvantage is the increased number of parts.

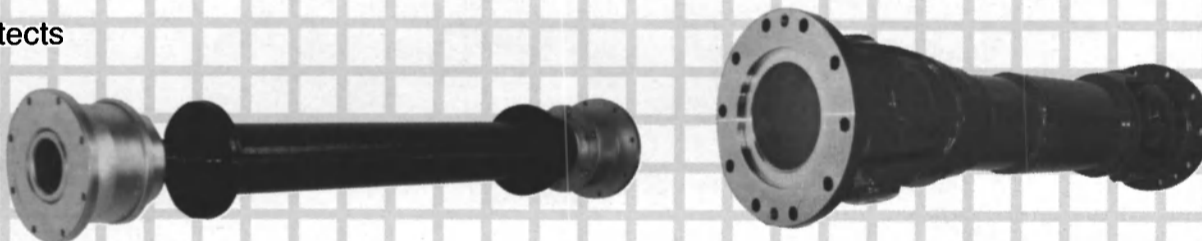
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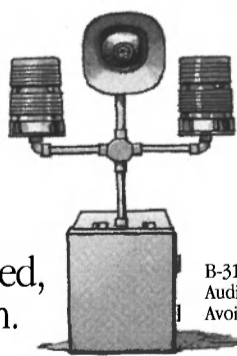
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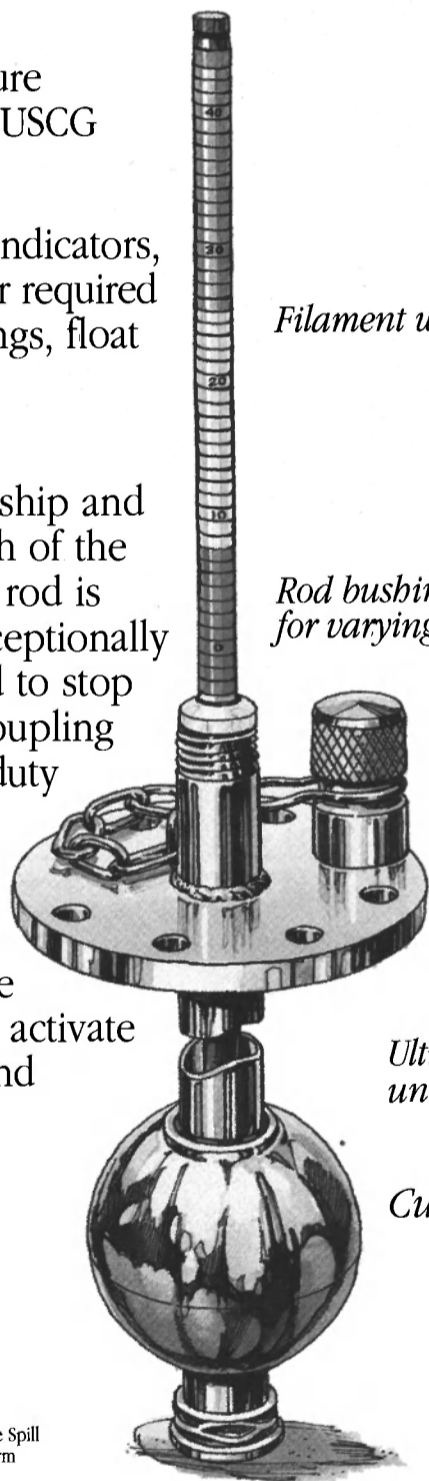
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Con-Select To Supply NNS Double Eagle Equipment

Con-Select, a designer and manufacturer of marine electrical switchgear, recently received orders for main and emergency switchboards, distribution panels and test panels from Newport News Shipbuilding for five, 45,300-dwt Double Eagle tankers.

The main switchboards are a

combination of generator control, distribution and motor control centers. Delivery of the equipment is to begin in December.

Con-Select is also involved in a project with Service Marine Industries.

It is supplying the ship service switchboard, propulsion switchboard and emergency switchboard for the Argosy Gaming riverboat casino. The ship service switchboard controls and distributes

power from three 1,400-kW generators, with automatic paralleling provisions, programmable logic annunciation and automatic load shedding.

Con-Select offers marine switchboards, motor controls, panelboards, transformers and other electrical equipment to the marine industry.

For more information on the company's complete electrical packages
Circle 199 on Reader Service Card

LATE CONTRACT NEWS

HDW Delivers Container Vessel

Container vessel *Zim Asia*, contracted by Zim Israel Navigation Co. Ltd., was delivered by HDW (Kiel, Germany). The vessel is 830 ft. (253 m) long and has a carrying capacity of 3,400 TEUs. The ship is the first of eight vessels, all of which will operate in Zim's "Tri Continent Line" container service between the U.S. and Israel.

Circle 198 on Reader Service Card

AESA Contracts For Stolt Nielsen Chemical Carrier Newbuilds

Astilleros Espanoles (AESA) has signed a contract to build four chemical carriers, with two options, for product tanker operator Stolt Nielsen. Three of the vessels are slated for building at the Sestao yard, and one will be constructed at the Spanish group's Juliana yard in Gijon. The new double-hulled tankers will be 533.4 ft. (162.6 m) long, powered by medium speed, diesel-electric machinery. Each tanker will have 36 integral and four deck cargo tanks, all constructed of solid stainless steel, providing a total capacity of approximately 25,000-cu-m.

Circle 197 on Reader Service Card

Vietnamese Government Places Significant Volvo Penta Order

Volvo Penta has received an order for 23 marine diesel engines from the Vietnamese government. The order is for eight TAMD102A engines for single installation, two of the same engines for twin installation, eight TAMD162C units for twin installation, and two TAMD163P for twin installation. Two AD41/DP engines and one TAMD41H engines will also be supplied.

Circle 196 on Reader Service Card

Alabama Yard Wins Contract

Alabama Shipyard, Inc. (ASI) recently announced that Baltanker Ltd. of St. Petersburg, Russia, has agreed to build five 16,000-dwt IMO chemical carriers at the yard. This order reportedly totals more than \$125 million, and along with the Dannebrog Rederi order for two carriers, brings the shipyard's orderbook to a total of seven chemical carriers. The latest order is subject to Marad's approval of Title XI loan guarantees. The vessels will be propelled by one medium-speed, single-screw diesel engine of approximately 4,800 kW. There will be six epoxy coated cargo tanks on port side, and six located starboard, with a centerline bulkhead.

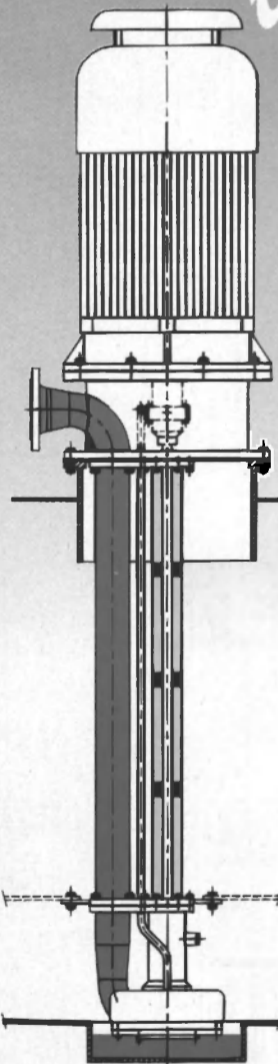
Circle 195 on Reader Service Card

Turkish Operator Awards Austal Four-Ship Deal

Austal Ships has secured a four-vessel contract worth approximately \$47 million with Turkish operator Istanbul Deniz Otobusleri (IDO). Although signed several months ago, complex finance issues were recently resolved. The contract includes two 40-m (131.2-ft.) passenger catamarans and two 60-m (196.8-ft.) "Auto Express" vehicle-passenger designs. All vessels will be driven by a propulsion package consisting of MTU diesel engines, KaMeWa waterjets and Reintjes gears.

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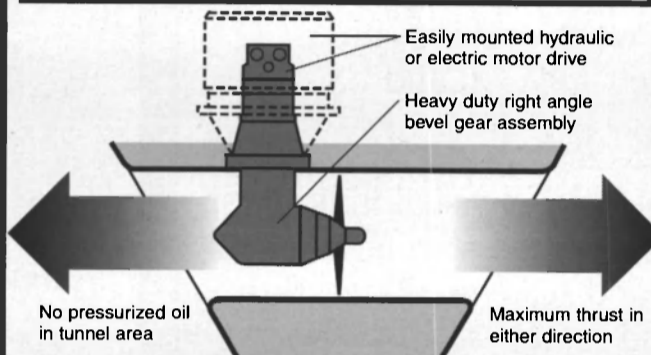
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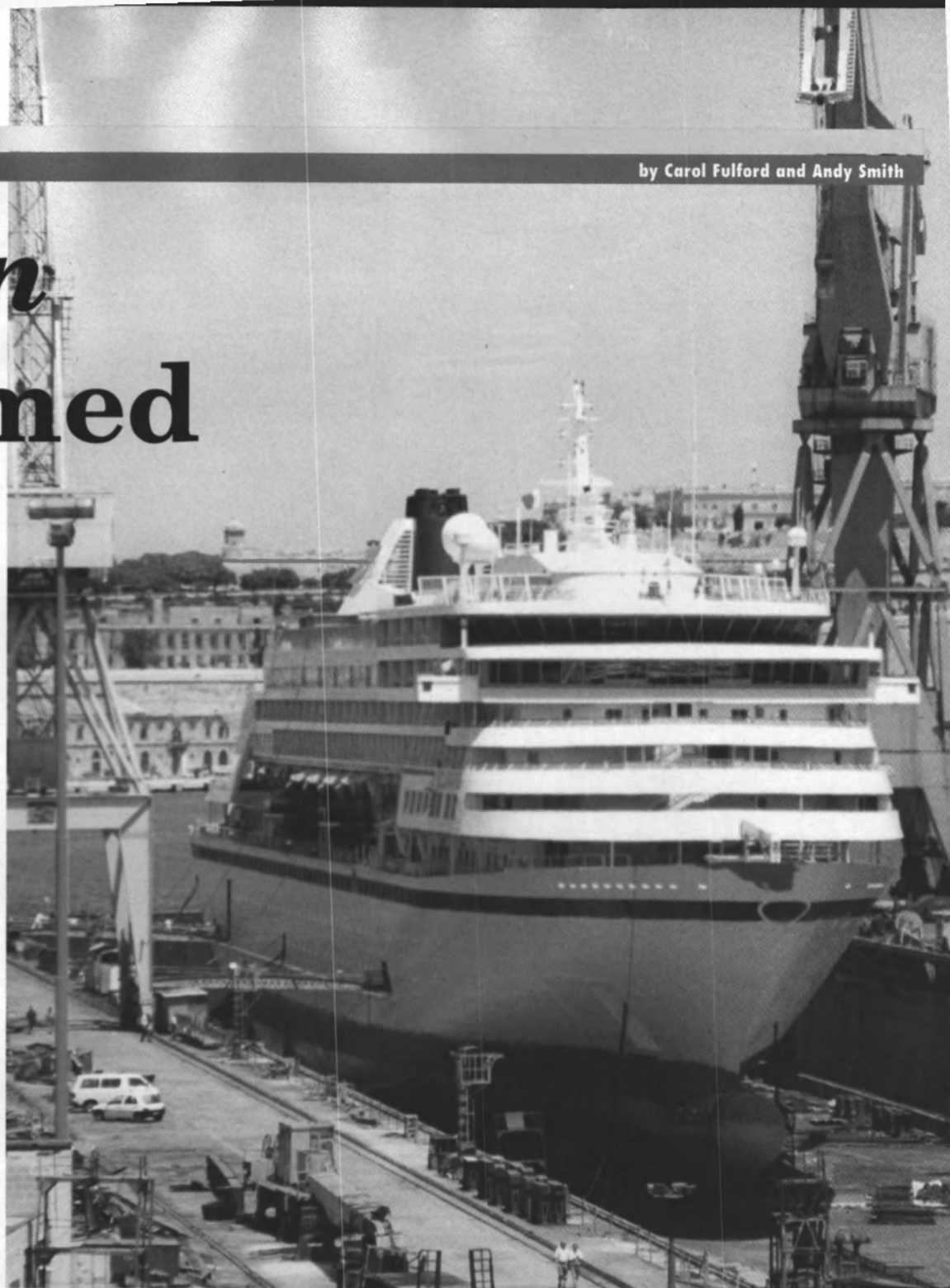
Viking Sun job welcomed in Malta

With five Iranian naval vessels, an LPG carrier, an Acomarit OBO and U.S. naval ship *Resolute* among the repair work at Malta ship repair facility, Malta Drydocks (MDD), the arrival of Cunard's much damaged *Royal Viking Sun* added a final fillip to employment prospects at a facility which is currently under strong political pressure to make itself pay.

MR/EN's visit to Malta took place just days before the cruise liner departed from Drydock No. 6, to which she was towed at the end of May following a collision with a coral reef in the Red Sea while en route to the Jordanian Port of Aqaba. Repairs, totaling around \$5 million, were largely due to extensive flooding, but also included fabrication of a new bulbous bow and in situ repairs to the adjacent bow area and starboard bilge keel. Extensive electrical work was also involved. More than 75 electrical motors including A/C compressor motors, each weighing 2.5 tons, were removed and packed for transportation to the original manufacturers for special cleaning and treatment.

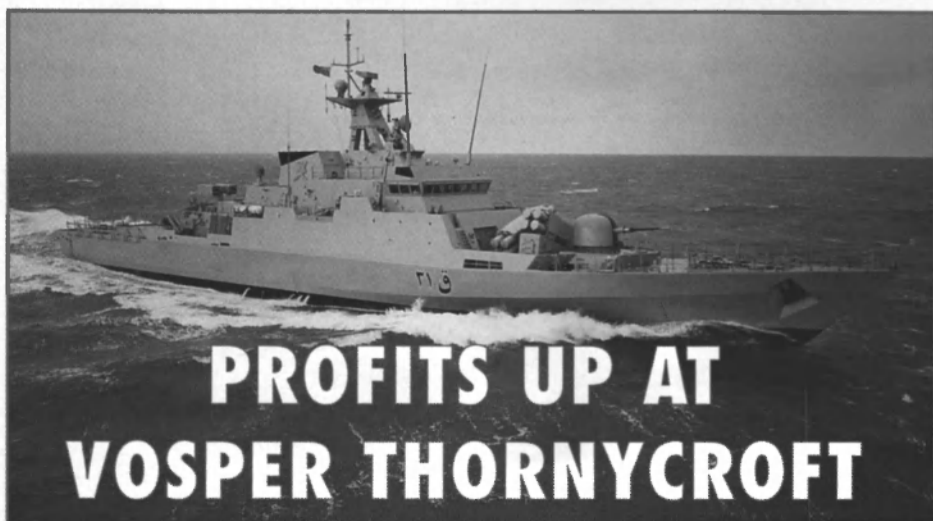
Both stabilizers were also in need of attention. The port side unit was completely removed for overhaul, and special attention was paid to alignment. The starboard stabilizer, damaged during the grounding, was also removed. Eighty-nine crew cabins, including furniture, furnishings, carpeting and electrical fittings, needed to be refurbished and extensive areas of insulation replaced in floors and bulkheads. Other work involved blasting certain hull areas, open deck swimming pools and painting of the hull from the veranda deck to the keel. Navigation equipment was also overhauled and ballast, fresh water and sewage tanks cleaned, blasted and painted.

Repairs to *Royal Viking Sun* were the latest in a long line of successfully completed contracts for Cunard and other cruise line operators, according to MDD's Council Secretary **Lawrence Zammit**, who claims a 100 percent default-free record for such deals. The vessel was due to depart along with Acomarit's *Chickasaw*, which had undergone emergency repairs including the replacement of shaft seals, and *Resolute*, which had received hull treatment and boiler overhaul. As well as the task of refilling the drydocks with



repair work, MDD directors and most particularly Chairman **Sammy Meilaq** continue to fight long-standing political battles over the yard's financial viability. Most significant is the fight to retain the facility's smallest drydock — the No. 1 dock — which, due to its position and means of access, is seen by many in the local community as an ideal location for a pleasure boat marina. Malta Finance Minister **John Dalli** has suggested that the dock be traded off against long-standing tax debts, but Mr. **Meilaq** is

standing firm, agreeing only to part with the dock if another is provided. As MDD is in the process of merging with another government owned concern, Malta Shipyards, (MDD prefers the term 'takeover'), increased pressure can be placed on the need to retain a smaller dock as more work on smaller vessels is envisaged. "Conversions will be an ideal means of making best use of all skills and this can prove highly profitable work," explained **Anthony de Gray**, MDD's deputy commercial and sales manager.



Despite its failure to win the U.K.'s Royal Navy Type 23 frigate contract which, after extended debate, was awarded to GEC Marine (an umbrella company that includes warship builders VSEL and Yarrow Shipbuilders), Vosper Thornycroft (VT) has reported pre-tax profits of \$41.1 million for 1996 to March 31.

VT profits are 10 percent higher than in 1995, which was a highly profitable period. Success, according to Chairman **Lord Wakeham**, is due to the broadening of the company's business base, independent of the yard winning warship contracts which accounted for 25 percent of the

turnover. The company reportedly has \$120 million in cash and a healthy orderbook worth more than \$675 million.

Lord Wakeham's annual statement, however, was quick to reinforce the volatility of the marketplace. "Conditions in the warship building industry worldwide remain difficult to predict and continue to be characterized by construction overcapacity and increasing competition," said the VT executive. However, he added, "Demand in our key export markets is stable and we have some excellent prospects."

VT continues to enjoy the benefits of a strategy designed to com-

Same operator ... different solutions

During 1996, three Aquamaster and two Voith type tugs are to be delivered to Howard Smith Towage & Salvage from Dutch and U.K. yards in a \$27-million U.K. expansion program boosting services at the ports of Southampton and Felixstowe, and on the rivers Medway and Humber. So far, three vessels have been delivered representing the two designs; both of which incorporate new features derived from the owner's extensive experience operating more than 130 tugs worldwide.

Southampton's new vessel, *Lyndhurst*, was

the first to arrive. Built at the McTay Marine yard on Merseyside, this 98.4 x 36.1-ft. (30 x 11-m), Voith Schneider propelled, Ruston diesel powered tractor tug follows five similarly configured vessels built by the yard for the same operator in 1990/91. An evolutionary process can, however, be detected. The most obvious visual change is a much higher sheer at the stern, designed to prevent the aft deck becoming awash when running astern at speed in escort mode. The aft fendering has also been dramatically improved and better wheelhouse

visibility accomplished by modifying the layout and removing horizontal window bars.

Power is provided by a pair of 1,500-kW Ruston 6RK 270 main engines, thus extending a close relationship between engine builder and operator. This current spate of newbuilds will bring the number of Ruston diesel equipped tugs in Howard Smith's fleet to 44. Each main engine has a Norgear step-up gearbox fitted to its free-end driving hydraulic systems for all the deck machinery, and a pair of Worthington

(Continued on page 19)

PROFITS UP AT VOSPER THORNYCROFT

pensate for the cyclical nature of large ship orders and has reduced the break-even point in its shipbuilding activities while developing a range of other business. Particular success has been achieved in the fields of naval training, career guidance and engineering services by participation in three major facilities management initiatives arising out of the British government's "Competing for Quality" and outsourcing programs.

In the warship building sector, the yard continues to trade well

with Middle Eastern countries, with recent deliveries including the first of two corvettes for the Royal Navy of Oman in early April, and a first-of-class fast strike craft for the Qatar Emiri Navy in May.

The corvette, described as a valuable addition to VT's portfolio, is of common base design to ensure flexibility and lower costs. The hull form, with slight variations in length, has already been offered to other customers and can be used as a platform for a range of ships including light frigates and offshore patrol vessels. VT Ship

Sales Director **Laurence Gandar** described the 272.2-ft. (83-m) long steel SNV *Qahir Al Amwaj* (Conqueror of the Waves) as powerful and versatile, capable of extended offshore operations and providing both a defensive and offensive capability with state-of-the-art electronics and weapons systems.

With speeds in excess of 25 knots in rough conditions, the vessel is particularly suited to the severe conditions of the Arabian Sea and the approaches to the Arabian Gulf through the Gulf of Oman. Accommodation has been provided for up to 79 officers although the

ship is designed for operation with a complement of 60. Principal duties involve Economic Exclusive Zone (EEZ) patrol duties and operational support activities, but fishery protection, anti-smuggling, search and rescue, disaster relief and pollution control tasks are also envisaged.

Power is provided by four Crossley Pielstick medium speed 16-cylinder V diesels driving two cp propellers via reduction gearboxes. Each machinery set operates independently and one engine per shaft is sufficient to obtain speeds in excess of 20 knots. VT

(Continued on page 18)

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PROFITS UP AT VOSPER THORNYCROFT

(Continued from page 17)

has provided the machinery control and surveillance systems as well as steering gear and stabilizers.

To improve radar cross-section

signature of the ship, the hull form and superstructure have been carefully designed to minimize radar reflection and measures have also been incorporated to

improve the infrared signature.

The second vessel, SNV *Al Mua'zzar*, will be delivered later this year and is scheduled to arrive in Oman early in 1997.

The Qatar Emiri Navy has also, meanwhile, accepted a new VT first-of-class vessel — the fast strike craft QENS *Barzan*, built at VT's yard in Portchester. Design of the 183.6-ft. (56-m) craft has been evolved from similarly sized vessels delivered to Oman and Kenya, using the same basic hull form but with a totally redesigned superstructure and internal arrangement. Operational and accommodation spaces are arranged to reduce motion and noise, better access has been provided along the upper deck and a second deck level has been incorporated. Power is supplied by four MTU diesel engines, each driving through a reverse/reduction gearbox into a fp propeller.

The vessel also benefits from VT's own advanced Machinery Control and Surveillance System (MCAS), a microprocessor-based ship platform management package which enables one-person control of main propulsion, electrical and auxiliary systems from the bridge. High quality VDU color graphics enable the operator to examine the status of any ship system displayed on a mimic diagram.

Several versions of the design have been proposed including an anti-submarine version with variable depth sonar and torpedo armament, and an EEZ patrol version for coast guard or customs customers. The EEZ versions would be capable of carrying large fast seaboats, or have the ability to operate a small helicopter for search and rescue duties.

Three additional vessels in the Qatar series are on order. The second vessel, QENS *Huwar*, will be delivered later this year. The third ship, QENS *Al Udeid*, was launched in March, and the final vessel will be launched in August.

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RRD order boost

Babcock Rosyth Defence and other members of the Babcock International Group are to wait until the fall of this year for a decision from the U.K. Ministry of Defence enabling them to purchase the Scottish military repair facility Rosyth Royal Dockyard (RRD) at Rosyth in Fife.

A multi-national engineering business which still retains 25 percent of its former Energy Division following sale last year to Mitsui Engineering & Shipbuilding, Babcock International hopes for a positive conclusion to current negotiations, especially as RRD has recently received a multi-million dollar order boost. Contracts have been placed for \$75 million, one-fifth of which is to be earned for the decommissioning of the Polaris submarine HMS *Resolution*. Refit of the trawler-style Island class offshore patrol vessel HMS *Guernsey* will cost another \$7.5 million, enabling the vessel to continue to protect extensive British interests in the North Sea oil fields and patrol the 200-mile fishery limit. Most lucrative, however, is a \$45-million deal to refit HMS *Cardiff*. Work has already commenced on this contract which includes a substantial package of alterations and additions.

Same Owner ... Different Solutions

(Continued from page 17)

fire pumps. The Rustons are also fitted with alternators to charge the batteries; part of another improvement to allow the vessel, if necessary, to remain fully operational without power from the generator sets. Located in their conventional 'tractor' position forward are the Voith Schneider 28GH/200 propulsion units. On trials, *Lyndhurst* achieved a maximum bollard pull of 45.3 tons and a free running speed of 12.5 knots — both in excess of contract requirements.

Howard Smith Towage insists that crew accommodation should be above main deck level and all the cooking, dining and sleeping facilities are contained within the deckhouse. Two single and two double cabins are provided together with separate galley and mess-room. The high, compact wheelhouse has become a characteristic feature of Howard Smith tugs as well as many built by McTay for other customers. It has an almost spartan but fundamentally functional interior, with a small floor area which contributes to the visibility. In order to see what is hap-

pening below, the skipper does not have to move from their position across to a window. The command console is straightforward, and it only houses the essential thruster, engine and winch controls. All other wheelhouse items are located either in a four-sided overhead console or adjacent to the chart table.

A different solution has been selected for the growing Port of Felixstowe fleet, with the recent arrival of *Melton* and *Bentley*, identical Aquamaster azimuthing stern thruster tugs. Before settling on this option, Howard Smith's Felixstowe operation 'borrowed' a Voith tractor and also a powerful stern drive tug from the company's own Humber and Medway fleets, and employed these vessels in practical trials, docking ships that regularly use the port.

According to Director **Ken Marshall**, the local requirement of high speed on and off the berth made the stern thruster option the preferred choice of all involved in the evaluation trials.

Once the decision was made, yards worldwide were invited to

submit proposals, but the final short list comprised Dutch, Spanish and U.K. yards. Damen, famed for its range of standard designs, offered a 107.4 x 39.2-ft. (32.7 x 12-m) hull with a draft of 15 ft. (4.60 m). The Howard Smith design team then suggested modifications to improve speed and astern running. The builder agreed to carry these out, and a contract was signed for three tugs, a third identical tug being required for the Medway.

Maintaining faith with the same engine builder, each tug is powered by a pair of 1,800-kW Ruston 6RK 270m diesels.

These drive Aquamaster US 2001/3325 azimuthing units through Twin Disc 3000.5 HD marine control drive clutches, as **Mr. Marshall** explained: "... to ensure the level of precision maneuvering necessary for the Felixstowe operation." On trials, the vessels reportedly achieved free running speeds of 13.5 knots and bollard pulls in excess of 60 tons.

As on *Lyndhurst*, all the living quarters on *Melton* and *Bentley* are above the main deck level. The

chief engineer and two crew members each have individual cabins on the lower level of the deckhouse adjacent to the mess room and galley, and the captain is accommodated one deck up immediately beneath the wheelhouse. This also follows the established pattern of the Southampton tug with full height windows and small floor area. In response to requests from Howard Smith's engineers, Aquamaster has developed an improved control system to facilitate close-quarter maneuvering. Called the 'Aquaduo' it comprises three modular panels compact enough to be located side-by-side within easy arm's reach; with dual steering levers, dual speed control levers and a small steering wheel between them.

Interest shown in all the new tugs has been high and already the Aquamaster versions would appear to have set a standard, as the vessels ordered by U.K. operator Cory for Milford Haven bear a remarkable similarity. At the time of *MR/EN's* visits to Southampton and Felixstowe, Damen and McTay each had one more tug to deliver to Howard Smith.

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Bulker Safety Creeps To The Forefront Again

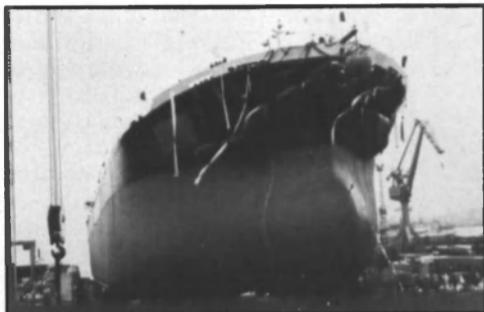
The council of the International Association of Classification Societies (IACS) has agreed on an extensive new package of what it

terms "tough measures and initiatives" to improve bulk carrier safety. The initiative, which is built on previous successful initiatives and a dedicated study begun last year,

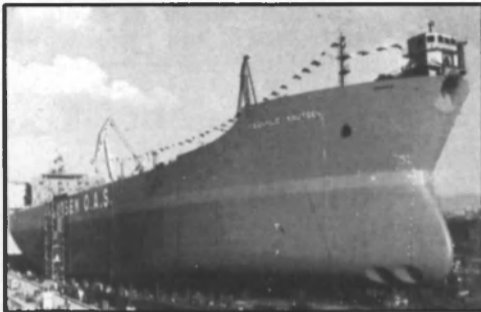
is a five-element program which addresses both enhanced watertight integrity for the existing fleet and design developments for future ships. Key elements include

acceleration of IACS' cargo hold surveys on older vessels, more rigorous requirements in the IACS Enhanced Survey Program and proactive cooperation to improve loading practices. Work is to accelerate on new Unified Requirements for newbuildings contracted on or after July 1, 1998, and fresh research into increasing survivability of laden ships experiencing accidental hold flooding will also be stepped up.

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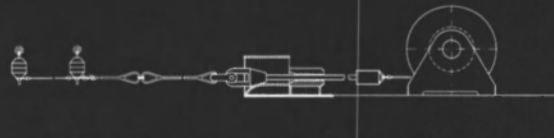
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ONE: To accelerate completion of the cargo hold element of its Enhanced Survey Program, the council agreed that members may require this before the previous deadline of January 1, 1998. This applies to all pre-1987-built bulk carriers 492 ft. (150 m) and longer classed by IACS' members that have not commenced an Enhanced Special Survey by a date to be specified by each IACS member no later than January 1, 1997.

TWO: IACS is introducing significant new provisions to tighten and extend its Enhanced Survey Program for bulk carriers. Annual surveys will now require close-up surveys of hatch covers and coamings. Ships more than 10 and less than 15 years old will require an overall survey of all cargo holds and a close-up survey of the lower third of a minimum of 25 percent of shell frames, including their lower end attachment, and adjacent shell plating in one forward cargo hold. In the case of vessels more than 15 years old, the same provision is extended to cover two cargo holds.

In intermediate surveys on vessels of 10 and less than 15 years old, an overall survey of all cargo holds and a close-up survey of two holds, frame attachments and bulkheads are expanded to cover all cargo holds, with close-up survey to cover a minimum of 25 percent of shell frames. In ships older than 15 years, these requirements are increased to cover all frames and transverse bulkheads in all holds.

The accelerated cargo hold surveys and more rigorous enhanced survey program provisions are to be implemented by all IACS members by no later than January 1, 1997.

THREE: On the operational side, IACS is seeking to reduce risk and damage to bulk carriers caused by improper loading practices. It is proposing to the IMO, Intercargo and the International Chamber of Shipping that a working group be set up to identify and visit the administrations responsible for port services in the main bulk loading countries, and major companies concerned with mineral

exports. The objective will be to obtain their cooperation in proper loading/unloading practices, especially recognizing the crucial cooperation between ships' staff and loading terminal personnel, which is necessary for avoiding the risks of damaging stresses during ship loading and discharging.

FOUR: Council has tasked an IACS working party to complete its work on defining enhanced design strength criteria for new ships. This includes research in preparation for introducing new or revised IACS Unified Requirements on longitudinal strength and double-bottom strength in hold flooded condition; strength or watertight transverse corrugated bulkheads; the robustness of side shell and side frame structures; and the robustness and reliability of hatch covers in heavy weather. The plan is to complete a comprehensive and integrated set of IACS requirements for adoption no later than July 1, 1997, which will apply to new ships contracted for construction on or after July 1, 1998.

FIVE: IACS members are developing measures which, if complied with, would enable the transverse watertight bulkhead boundaries of cargo holds of existing bulk carriers of 492 ft. (150 m) and above to withstand flooding of any cargo hold in all permissible conditions of loading, taking into account dynamic effects resulting from the presence of water in the hold.

For more information on IACS
Circle 92 on Reader Service Card

Rapp Bomek Profits From FPSO Upturn

Supplying fire doors for floating production storage offloading (FPSO) units is a growing market for Norway's Rapp Bomek. With an estimated 60 new FPSOs coming online by the turn of the century, Rapp Bomek sees it as an expansion market. "This is definitely an area we focus on," said **Tore Torrissen**, Sales manager. To date, Rapp Bomek has supplied exterior fire doors for six FPSOs.

For more information on Rapp Bomek
Circle 32 on Reader Service Card

LNG FPSO Offers Latest In Tank Technology

The SPB LNG floating production storage offloading (FPSO) from Japan's IHI offers many operational advantages, particularly the SPB tank, which is a self-supporting, prismatic-shape, IMO type B tank. Among its many advantages, the SPB tank provides for a flat upper deck, allowing plants, loading stations, deck-house, mooring fittings and other

equipment to be arranged freely. In addition, the tank shape and size is flexible, helping to reduce hull dimensions and cost.

Also, the LNG tanks are constructed in a manner similar to that used for hull construction, and bear higher positive/negative pressures, which enable simple control and safe operation.

For more information on the
IHI FPSO design
Circle 33 on Reader Service Card

Red Fox Sanitation Device Installed On Mexican Fleet

A final shipment of marine sanitation devices (MSD) has left Red Fox Environmental Services facilities in Lafayette, La., for multiple ports in Mexico. Thus far, one hundred vessels have reportedly been outfitted with Red Fox MSDs. In addition, six land facilities have also been equipped with 20,000

gallon per day sewage treatment plants, including one system at the Mexican Navy School in Veracruz.

Mexican Navy facilities performing the MSD installation include Veracruz, Tampico, Guayamas, Coatzacoalos, Ensenada, Salina Cruz, Chetumal and Acapulco. The project began when Mexican RADM. **Miguel Hernandez Garcia** was in charge of Maintenance and Engineering.

For more information on Red Fox Marine
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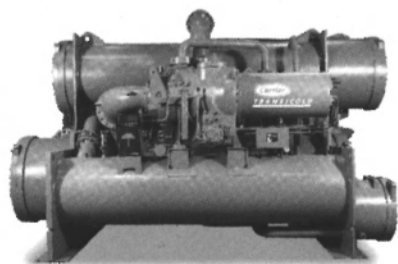
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ORDERS CONTINUE TO FLOW

A digest of business happenings in the shipbuilding and ship repair markets in the Far East. — by Alan Thorpe, international editor

The Japanese government has said that it is in agreement with OECD proposals for ending shipbuilding subsidies as well as outlawing price dumping. The Japanese Diet has, in fact, now ratified the OECD proposal set before it.

The Japanese shipbuilding industry received export orders for a total of nine ships (350,000 gt) in May, compared with 27 ships (880,000 gt) in April. Also in May, 18 ships (548,661 gt) were delivered, leaving a total export orderbook of 371 ships (13,997,415 gt).

The bulk carrier market is currently the most successful one for the Japanese, with recent orders including:

- Four 72,000-dwt units ordered by Malaysian International Shipping Corp. (MISC) from Sasebo Heavy Industries (\$28 million each);
- Three ships (one 73,000-dwt and two 45,000-dwt) ordered by Hong Kong's Golden Ocean Management from Tsuneishi Shipyard;
- Two 28,152-dwt ships from Colonial Investment, also from Tsuneishi; and
- Two 74,000-dwt vessels ordered by Greece's John Samonas from NKK Corp.

On the tanker side, U.S.-based chemical tanker specialist Stolt Nielsen has entered into an agreement with Fukuoka Shipbuilding for a series of four 11,500-dwt chemical tankers. The ships are to be used by Stolt NYK Asia Pacific Service.

DHI Lands Aframax Deal

In the South Korean shipbuilding industry, Finnish shipowner Lundqvist has ordered an aframax tanker (with an option) from Daewoo

Heavy Industries (DHI). DHI is also building four similarly sized tankers for Greek shipowner Kristen Navigation, which is part of the Anangel Group.

Another South Korean yard to benefit from the international market is Hanjin Heavy Industries Corp. (HHIC), with German shipowner Hansa Treuhand placing a \$120-million order for four 1,600-TEU containerships, in addition to the two that were ordered during April.

China Shipbuilding Corp. Woos German Owner

In the meantime, Taiwan's China Shipbuilding Corp. has made its mark on the international market with an order from Germany's Rederei Bertram Rickmers for a series of six 2,226 TEU containerships. This is a new move for the German shipowning company which, over recent years, has favored Polish yards.

SKD Invests in Repair Facilities

Japan's Shin Kurushima Dockyard (SKD) has invested \$12.8 million in expanding its repair capabilities at its Tokushima shipyard in Komatsujima by ordering a new floating dock from Hitachi Zosen. The company will now integrate all ship repair work at Tokushima and focus newbuilding at Ohira shipyard in Hiroshima. The new, 6,000-grt capacity floating dock will be the third at Tokushima. Two others have respective capacities of 2,000 and 3,200 grt. The latest dock will be completed at



Keppel Shipyard will repair Phoenix Trader, a 271,896 VLCC, in its new 360,000 dwt dock.

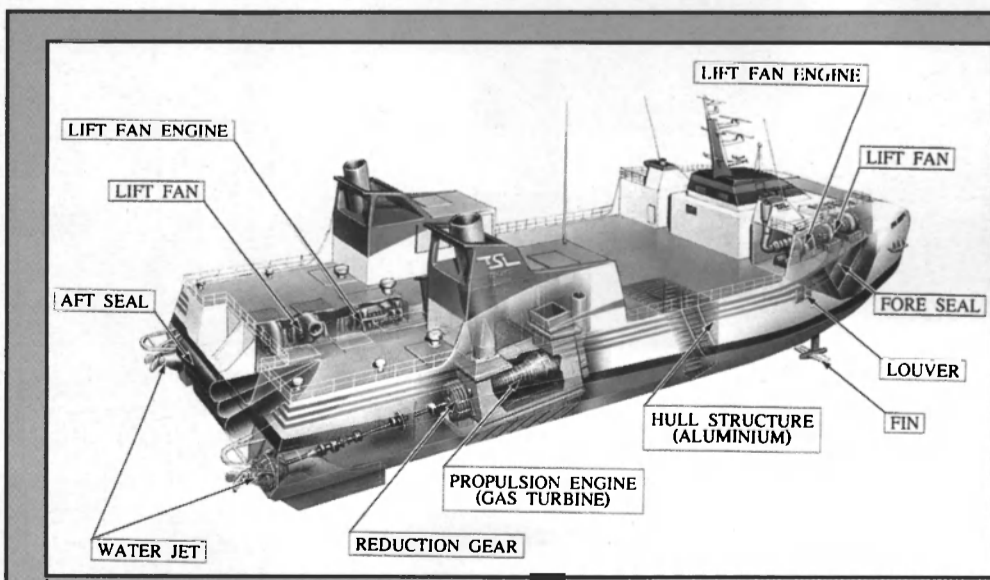
Hitachi Zosen's Innoshima shipyard in July, and towed to Tokushima for installation and full operation this month. The 2,000-grt capacity drydock is due to be scrapped once the new facility is operational. Shin Kurushima Dockyard has seen a steady decline in its earnings from the ship repair business.

Miami Holding Gets Lift From Far Eastern Business

Miami-based Syncrolift has been busy with some new orders from the Far East. Indonesia's PT Batamas has ordered a 5,700-ton lifting capacity unit; Singapore Technologies has ordered a 5,000-ton unit to complement the existing 3,500-ton unit, which was installed in 1972; and Australia's Darwin Ship repair & Engineering ordered a 2,500-ton unit. Meanwhile, Malaysia Shipbuilding & Engineering (MSE), Pasir Gudang, is in the process of installing a panamax-capacity unit.

Investments Abroad (Potentially) Reap Big Rewards

South Korean shipbuilder Daewoo Heavy Industries (DHI) has now completed the acquisition of a controlling interest in Romania's 2 Mai Shipyard, located near the Bulgarian border south of Constantza Port. This deal gives the Far Eastern company management-control of one of the largest shipbuilders on the Black Sea. DHI will take a 51 percent stake in the



R&D: Techno-Superliner Chosen As Ship Of The Year

The Society of Naval Architects of Japan (SNAJ) selected *Hisho* (pictured, one of the experimental ships for the Techno-Superliner) as the Ship of the Year, 1995. The ship was developed by the Technological Research Association of Techno-Superliner (TSL Association) to achieve high-speed marine transport. The award ceremony was held May 15 during the SNAJ general meeting at the Nakano Sun Plaza in Tokyo, and was presented to Mitsubishi Engineering and Shipbuilding Co., Ltd, and Mitsubishi Heavy Industries Ltd. — constructors of *Hisho*, and to the TSL Association. The award, established in 1990, is to encourage construction of excellent ships.

new joint venture company, called Daewoo Mangalia Heavy Industries, for \$53 million. The yard will give DHI a headquarters from which to chase repair work in the wider Black Sea area, as well as in the Mediterranean. DHI's cash injection is expected to lift shipbuilding productivity and more than double repair capacity.

Another South Korean shipbuilder involved in overseas developments is Halla Engineering & Heavy Industries, which is planning to set up a shipbuilding complex in Vietnam at Vung Tau. The yard will have the capability of building ships up to 30,000 dwt and repairing ships up to 60,000 dwt.

A sign that the cost of newbuilding is rising in the South Korean shipbuilding industry was recently seen with Samsung Heavy Industries (SHI) beginning a deal with a mainland Chinese shipyard (Ningbo Shipyard) for the construction of hulls. This building yard in China will be 100 percent controlled by SHI and its goal is to reduce newbuilding costs in South Korea with the use of Chinese labor.

Malaysian shipowner Halim Mazmin and Japan's Tsuneishi Shipbuilding are teaming up to build a ship repair facility on the east coast of Malaysia, near Kemaman. The partners have set up Kemaman Heavy Industries (KHI), a new company which is 40 percent owned by Halim Mazmin; 30 percent owned by Tsuneishi Shipbuilding and 30 percent by other Malaysian interests.

The new development will take up a 25-hectare site. For the first phase, KHI will have a drydock, a slipway and a floating dock, and will focus on ship repair for at least the first two years, before expanding into shipbuilding and other markets. Halim Mazmin currently estimates the total market value for ship repair in Malaysia to be approximately \$275 million per year.

New Dock, No Waiting

Singapore's Keppel Shipyard has recently opened a new \$100-million graving dock at its Tuas yard, the dock capable of accommodating ULCC vessels up to 360,000 dwt. The new facility will be inaugurated in the third quarter of this year. The graving dock was built by KE-Fujita, a joint venture between Keppel Engineering (KE), which is a subsidiary of Keppel Integrated Engineering, and Fujita Corp. of Japan. The new dock complements two other graving docks at its Tuas yard, the largest being 1,164.6 x 196.8 ft. (355 x 60 m), capable of accommodating vessels up to 330,000 dwt (ULCC).

The first ship to use the new facility was the 69,999-dwt, Vanuatu-registered tanker *Petrobulk Mars*, which is owned by Amsterdam's Ness Shipping

(Holland) Ltd., with the 258,082-dwt Panamanian VLCC *Phoenix Trader* being the first VLCC to be docked. She is owned by Mitsui OSK Lines of Tokyo.

Meanwhile, there has been some more reorganization at Keppel. **K.C. Leong**, who was recently replaced at Keppel Cairncross in Australia by **C.H. Tong**, has decided to leave the company and join

Thailand's Unithai. He will be followed by two or three section leaders from Keppel.

Earlier this summer, Petroleum Shipping, Southampton, the managers of Exxon's international fleet, decided to allow Singapore's Keppel to quote again for drydocking work. Relations had severed between the two companies following a bribery scandal during June

1995, which resulted in a member of Esso's technical team receiving a three-year custodial sentence in the U.K. The first ship to be offered for quote by Petroleum Shipping was the 307,235-dwt *Geneva*. However, *Geneva* and the similarly-sized *Kawasaki* were finally awarded to Malaysian Shipbuilding & Engineering.



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From Two Comes One

A rather remarkable repair operation has taken place in South Korea's Hyundai Mipo Dockyard (HMD), Ulsan, showing the type of innovative projects undertaken in the repair industry. Spanish shipowner Empressa Nacional Elcano de la Marine Mercante SA, Madrid, has taken two of its cape-size ships into the yard, with only one coming out again for future

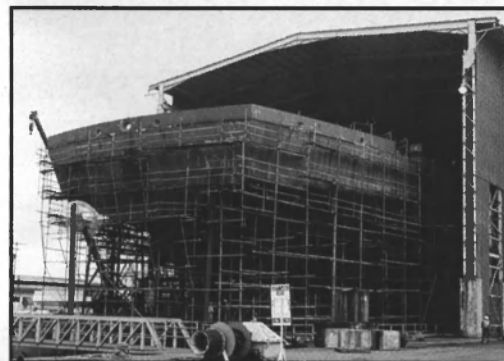
service.

The ships involved are the 173,187-dwt bulk carrier *Castillo de la Luz* and the 130,187-dwt tanker *Castillo de Montearagon*, both of which have the same principal particulars.

The yard has taken the forebody of the bulk carrier and the aft section of the tanker (engine room and accommodation), and joined the two sections together to form a new bulk carrier. The new ship will be

named *Castillo de Belmonte*. Meanwhile, the two "redundant" sections have also been joined for a voyage to the scrap yard.

However unusual it may seem, the history of the two ships illustrates that this type of operation has been performed before. Both ships were originally built as conventional tankers by Spain's Empressa Nacional Bazan, El Ferrol, during the mid-1970s. During 1984, a new after section



Shipbuilding at MSE, which will soon implement a Synchrolift system.

was built by the same Spanish shipyard for the *Castillo de Montearagon* replacing the ship's original engine room and accommodation. Then, in 1987, a new forward section was placed on the *Castillo de la Luz*, changing her role to a bulk carrier. At the same time, the boilers for the main propulsion plant onboard the *Castillo de la Luz* were changed to coal-fired. All of this work was carried out by the Bazan shipyard. It is the two 1980s-built sections that have been joined to form *Castillo de Belmonte*.

SPD Technologies and Groupe Schneider Reach Agreement

SPD Technologies, Inc. has entered into a license and technology assistance agreement with Group Schneider of France, which will support SPD's current development of a new line of air circuit breakers specially designed for U.S. Military-specific applications.

SPD's planned line of "next generation" Military-specific air circuit breakers will utilize Group Schneider's Masterpact low-voltage circuit breaker technology and will meet U.S. Navy specifications, including shock, vibration, interruption and thermal requirements.

The technical agreement between the two companies further provides for SPD to manufacture the advanced new product line for Groupe Schneider's use and sale in European and other international markets where U.S. Military-specific products are required. SPD Technologies is a worldwide leader in the design, engineering, manufacture and servicing of innovative shock-hardened circuit breakers and switchgear. SPD's subsidiary companies include PacOrd, a shipboard repair and overhaul company and Henschel, a manufacturer of automation and control systems.

Groupe Schneider is involved in electrical control and automation products and services, marketing three primary brands of equipment: Merlins Gerin; Square D; and Telemecanique. The Modicon line of programmable controllers is also available through Groupe Schneider.

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Hitachi Zosen Delivers VLCC, Completes Bulk Carrier Construction

Navix Astral, a 259,987-dwt VLCC, has been completed at the Ariake Works of Hitachi Zosen. This tanker, under Panamanian registry, was delivered to the owner — Golden Bayshore Corporation — in March.

The features of the vessel include: Super Stream Duct, a nozzle developed by Hitachi Zosen, located in front of the propeller and fit-



ted with a large bulbous bow below the fore waterline; a low-speed, long-stroke, static-pressure supercharged engine; cargo oil and ballast tanks with remote-control level gauges, for oil monitoring in the cargo control room; and wheel house operation of the main engine through a microcomputer-equipped remote-control system.

In addition, Hitachi Zosen has completed *Far Eastern Auspice*, a 72,171-dwt bulk carrier, at its Maizuru Works. This is the 80th Hitachi

panamax and the second vessel of the Hitachi panamax Optima class in which several improvements have been made to the original version. These include a larger propeller, as well as increased tonnage and cargo capacity.

For more information on Hitachi Zosen
Circle 10 on Reader Service Card

Navix Astral Main particulars

Length o.a.	1,062.6 ft. (323.9 m)
Breadth	185.7 ft. (56.6 m)
Depth	93.8 ft. (28.6 m)
DWT	259,987 metric tons
Main engine	Hitachi Zosen MAN B&W 6S80MC
Speed	14.8 knots
Classification	Lloyd's Register

Far Eastern Auspice Main particulars

Length	705.3 ft. (215 m)
Breadth	105.6 ft. (32.2 m)
Depth	61 ft. (18.6 m)
DWT	72,171 metric tons
Main engine	Hitachi Zosen MAN B&W 6S60MC
Classification	ABS

Damen Hands Over *Kanoo 23*



On May 2, crew launch *Kanoo 23* was handed over by Damen Shipyards to its owner, Yusuf Bin Ahmed Kanoo. Successful trials were reportedly held during the same day in Dutch coastal waters. With a length of 88.2 ft. (26.9 m) and a beam of 20.3 ft. (6.2 m), *Kanoo 23* is the final vessel in a series of four that were built between February 1995 and April 1996, intended for operation in Saudi Arabia, Sharjah and Dubai. Their main function is crew change and the transportation of equipment, stores and personnel to offshore bases. The design was developed from the Damen Stan Tender 2600, of which more than 50 units have reportedly been produced since its introduction, and are in operation in various locations throughout Asia, the Middle East, Africa and Europe. The steel hull and aluminum superstructure of *Kanoo 23* are reportedly designed for ample strength and minimum vibration. Two Caterpillar type 3512B diesel engines give the vessel a top speed of 22 knots. The fuel capacity is reportedly sufficient for a range of 500 nautical miles in less than 24 hours.

For more information on Damen Shipyards
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Greeks Place Order For Stress Monitoring Systems

Piraeus-based Kristen Navigation Inc. has placed what is reported to be the largest order to date for hull stress monitoring systems. The company has placed orders for a total of nine BMT SMART stress monitoring systems with BMT SeaTech of Southampton. The systems are being fitted to four Aframax tankers and a Capesize bulk carrier, currently being built for Kristen and Anangel Shipping by Daewoo and Hyundai Shipyards in Korea. An additional four systems are to be retrofitted to Capesize carriers already in service within the Anangel fleet. All the vessels will be classed with ABS, DNV or Lloyd's Register, and installations will be to class requirements.

AOP Offers New Line Of Underwater Cameras

Applied Ocean Physics (AOP), a San Diego-based underwater imaging design and production company, has introduced a new line of high-performance, underwater, black and white and color cameras. The MCO2 is an ultra-small, high resolution, monochrome CCD camera. This new minicam measures 2.2 x 2.8 in., and weighs less than .5 lb. in air. In addition to the new minicam models, AOP supplies a full range of broadcast quality and low light level intensified CCD underwater TV cameras, as well as high-pressure optics rated for depths up to 36,089 ft. (11,000 m).

For more information on Applied Ocean Physics
Circle 5 on Reader Service Card

HMS Marine Markets Shipboard Fire Safety Product

Smoke and toxic fume containment curtains for hatchway opening and stairwells manufactured by HMS Marine Hardware, Inc. This curtain design, dubbed Smoke-Gard — was reportedly created in response to a recent request from the U.S. Coast Guard for a product for use aboard one of its WMEC-class cutters.

Smoke and fume containment is a major concern aboard ships, as hampered visibility can cause delay in determining the location of the smoke source. This new safety device reportedly provides containment and control of smoke/toxic fumes rising up through open hatch and stairwell openings by providing a stored-in-place, rapid-deployment, pull-around curtain for immediate smoke containment.

The HMS Marine Hardware design utilizes Nomex fire-retardant curtain fabric, mounted to the overhead with metal slides fitted into a metal curtain track. The curtain is pulled forward from both sides, joining in the middle with overlapping panels which are held together with velcro fasteners to seal off the hatchway. The curtain can be parted to allow entrance or exit by fire team personnel.

For more information on HMS Marine Hardware, Inc.
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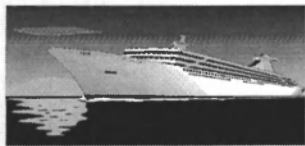
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Zim Israel Equips Fleet With Malin 3000 Diesel Engine Analyzers

Zim Israel Navigation Co. has equipped 15 vessels with Malin 3000 portable precision diesel engine analyzers. The Malin 3000 is designed to increase the speed, accuracy and reliability of the main and generator diesel engines. Information can be gathered and down loaded to a PC. A software program produces the drawcard indicator and derivative, and provides an immediate check on the fuel injection system, power output of each cylinder, fuel injection timing, engine balance and trends over time. The Malin unit is supplied with Windows software, which provides color charts and graphics.

For more information on the Malin 3000
Circle 6 on Reader Service Card

OTECH To Develop RHIBs For Commerical And Military Use

Ocean Technical Services, Inc. (OTECH), an ISO 9000 certified vessel repair and new construction company located in Harvey, La., is developing a series of rigid hull inflatable boats (RHIB) for commercial and military use. These RHIBs, which are to be in production by the end of this year, were designed by Crompton Marine, U.K., for commercial interests in the North Sea.

OTECH has reportedly acquired exclusive manufacturing and marketing rights for the western hemisphere and will modify the RHIB for the U.S. market.

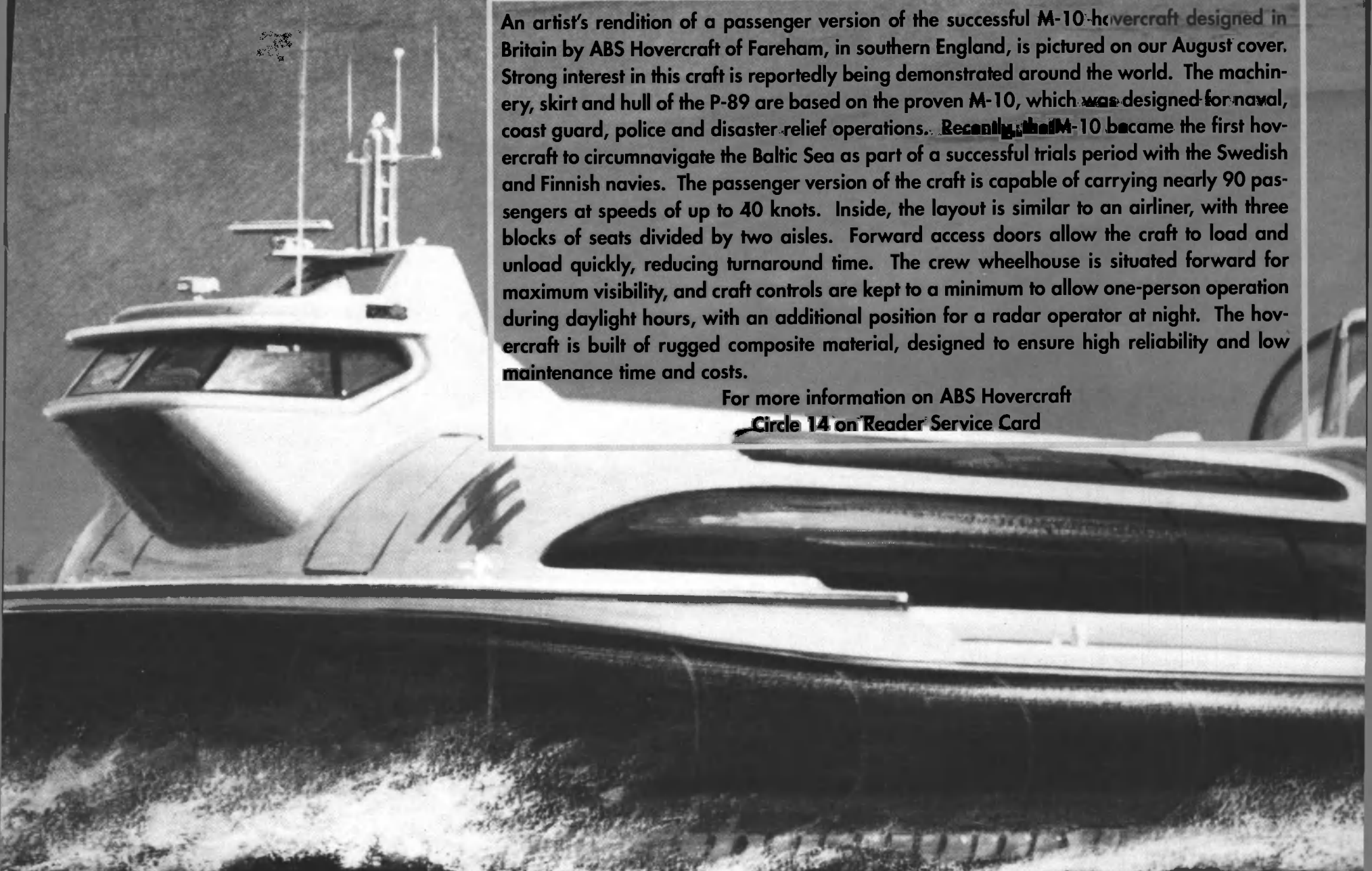
Three current models will comprise the initial offer — measuring 15.7 ft. (4.8 m) 18.4 ft. (5.6 m) and 22 ft. (6.7 m). A 32.8 and 39.4-ft. (10 and 12-m) versions are also planned. The full line will be able to accommodate the cruising, diving, racing, civil rescue, workboat, yacht tender, beach patrol, marine life observation, expedition and charter areas.

The commercial uses will accommodate the oil and gas industry, offshore ship tender, rescue police, customs, U.S. Coast Guard, fishery patrol salvage, civil engineering, environmental protection and military areas.

For more information on Ocean Technical Services
Circle 7 on Reader Service Card

Maritime Reporter/Engineering News

ship & boatbuilding technology



An artist's rendition of a passenger version of the successful M-10 hovercraft designed in Britain by ABS Hovercraft of Fareham, in southern England, is pictured on our August cover. Strong interest in this craft is reportedly being demonstrated around the world. The machinery, skirt and hull of the P-89 are based on the proven M-10, which was designed for naval, coast guard, police and disaster relief operations. Recently, the M-10 became the first hovercraft to circumnavigate the Baltic Sea as part of a successful trials period with the Swedish and Finnish navies. The passenger version of the craft is capable of carrying nearly 90 passengers at speeds of up to 40 knots. Inside, the layout is similar to an airliner, with three blocks of seats divided by two aisles. Forward access doors allow the craft to load and unload quickly, reducing turnaround time. The crew wheelhouse is situated forward for maximum visibility, and craft controls are kept to a minimum to allow one-person operation during daylight hours, with an additional position for a radar operator at night. The hovercraft is built of rugged composite material, designed to ensure high reliability and low maintenance time and costs.

For more information on ABS Hovercraft
Circle 14 on Reader Service Card

- p. 28 • New technology drives Gulf Coast oil business
- p. 30 • New generation self-unloading ship
- p. 34 • Underwater repairs save owners time/money
- p. 58 • First Double Eagle takes shape at NNS

Vast Opportunities

Technology, economics buoy Gulf Coast prospects

by Nina D. Miller, assistant editor



Western Geophysical's high-capacity seismic vessels can currently tow four streamers up to 29,527 ft. (9,000 m) in length, making deepwater seismic survey in the Gulf very efficient.

The INSET map to the left shows Western Geophysical's 3-D Gulf of Mexico activity. The lighter gray areas are mostly acquired and processed.



"... The Gulf is back," according to **William Charbonnet**, spokesman for Power Offshore Services, Inc. Having been a less than dynamic industry for the last decade, the offshore market in the Gulf of Mexico is now experiencing an upswing. While this resurgence is expected to be a conservative one — due mainly to current legislative issues which threaten to stunt growth — it is anybody's guess as to how high the market will go, as project numbers increase, and the trend continues toward digging in deeper waters.

Touting new technologies and tracking increased newbuilding/conversion orders, oil companies, exploration companies and shipbuilders alike are prepared to ride a bull market throughout the next few years.

Deeper Digging Brings Action To The Surface

The activity in the Gulf is at a level where supply and demand for equipment has reached a healthy balance for the first time in more than 10 years. Driving this activity is the price of oil and gas, as well as new technologies, such as deepwater drilling and production, and 3-D and subsalt seismic exploration. Mr. **Charbonnet** said that oil companies, both major and independents, are increasing their exploration budgets and allocating them back

to the Gulf of Mexico. Along with stabilized prices, production budgets have increased, he added.

The rise in interest in the Gulf of Mexico has also proven beneficial to oil service company Western Atlas Inc. "The Gulf of Mexico has become active in many areas for the oil and gas industry, all of which provide attractive opportunities for our clients: large, integrated oil companies; independents; and E&P (exploration and production) companies," said **Dirk Koerber**, vice president, Investor Relations, Western Atlas. These active areas are the transition zones (primarily Louisiana), deepwater, subsalt areas and shallow water exploration.

According to **John Chiannis**, partner at Han-Padron Associates, consulting engineers, Han-Padron's primary focus is on the deepwater market, which is "doing very well." This is best exemplified by the amount of drilling projects the company has been working on, and the number of very large, complex, potential platforms. Han-Padron is collaborating with Shell, Amoco, Chevron and Exxon; all deepwater projects — 3,400 to 4,700 ft. (1,036 to 1,432 m) depths — with the majority being tension leg platforms (TLP).

"Today's economy really moves oil companies to get these systems installed as quickly as possible," said Mr. **Chiannis**. The technology to streamline design and make computer links to

complete projects in a shorter time frame with fewer people, thus providing more business, does exist. The faster these projects are implemented and brought on line, the greater the return on the equipment. For example, according to Mr. **Chiannis**, if one structure can be brought on line one month early, it translates into a savings of at least \$3-7 million. This puts a lot of pressure on engineering companies like Han-Padron to design these systems as quickly as possible, and to speed-up the fabrication process. "Schedule compression" has become a key word at Han-Padron.

Hugh Thompson, a senior Facilities engineer at Chevron, corroborated Mr. **Chiannis'** views. According to Mr. **Thompson**, the deepwater market is improving due to a number of real/planned projects in Houston. There has been a significant increase in the number of these projects, as well as in deepwater lease sales.

He said that one thing that has led to an improvement in the offshore market is not so much the change in oil prices, but the discovery by Shell that flow rates are much higher, with a typical well producing 2,000 barrels of oil per day. This ameliorates the economics of projects in terms of improvements in facility costs.

"The move to deepwater is due to advancements in geophysical technology," said Mr. **Thompson**. Like Mr. **Charbonnet** of Power

Trinity To Build Anchor Handling/Towing Supply Vessel For Seacor

The Trinity Marine Group, Gulfport, Miss., and Seacor Marine Inc. of Houston have signed a contract for a 225-ft. (68.5-m), 12,280-bhp anchor handling/towing supply vessel with a bollard pull in excess of 140 tons.

"We have built more offshore support vessels (OSV) than any other U.S. shipbuilder and this new vessel and Seacor will benefit greatly from that experience. It also represents an important evolutionary step in the design of U.S. offshore support vessels because it incorporates features from the Halter Marine Kodiak design and adds features found on European OSVs that operate in conditions that differ greatly from those of the Gulf of Mexico. This will enable the new vessel to operate in the Gulf and serve rigs in much deeper waters, while enabling it to operate in many international waters," said a Trinity official.

Overall, the new Seacor vessel will be 225 ft. (68.5 m) long, with a 52-ft. (15.8-m) beam and a 22-ft. (6.7-m) deep hull. Loaded draft will be 18.7 ft. (5.6 m) and a light draft will be 11.7 ft. (3.5 m). Her double bottom hull, and other safety features, meet SOLAS requirements and new U.S. Coast Guard Subchapter L requirements.

The 12,280-bhp — reportedly the most powerful ever in a Trinity commercial AHTS — will be produced by four General Motors EMD 16-645-E7B diesel engines driving through Reintjes compound reverse/reduction gears. The compound gears give the captain the flexibility to disengage two of the four engines for greater fuel economy when they are not needed, and the vessel's 1,600-kW generators can be operated independently through clutches from the CP system, or in conjunction with the propulsion system to make efficient use of the available horsepower.

Berg 140-in., four-blade CP propellers in Kort nozzles will propel the vessel. Maneuverability will be aided by two 600-bhp, DC motor-driven bowthrusters and one 600-hp, DC stern thruster. The double plate rudder will incorporate a palm for ease of removal.

Anchor handling and towing will be handled by a Smatco 116 EAW 660 double-drum waterfall 850-hp DC electric winch with 660,000 lbs. of pull. Each drum can hold 7,900 ft. (2,407 m) of three-in. wire rope. Other towing and anchor handling equipment will include a retractable Triplex shark's jaw chain stopper of 350-ton capacity, retractable Triplex towing pins, two 20,000-lb. capacity tugger winches and two wire storage reels, each with a capacity of 8,000 ft. (2,438 m) of 3.25-in. wire rope. Additional deck equipment will include two 10,000-lb. capstans, an anchor windlass and a five-ton capacity crane. The 127 x 41-ft. (38.7 x 12.5-m) aft deck can accommodate up to 1,200 long tons of cargo.

The vessel will be equipped with a Robertson dynamic positioning system, and the pilothouse will include Berg electronic controls, two Sailor VHF radios and one SSB radio, two Furuno radars and a Sperry gyro and steering system, plus additional communications and navigation equipment.

The boat will be U.S. flagged and ABS classed, Maltese Cross A1, Maltese Cross AMS towing supply, and will be certified for freight and towing by the U.S. Coast Guard.

Trinity shipyards have built 22 other supply and tug supply boats for other companies that are now owned or operated by Seacor. Seacor also operates nine crewboats, one tug and one line launch built by Trinity yards for other companies.

Tug supply vessel main particulars

Length o.a.	225 ft. (68.5 m)
Beam	52 ft. (15.8 m)
Depth	22 ft. (6.7 m)
Light draft	11.7 ft. (3.6 m)
Loaded draft	18.7 ft. (5.7 m)
Main engines	(4) EMD 16-645 E7B
Reduction gears	Reintjes compound

Offshore, he also believes that the use of 3-D and subsalt seismic is leading to a lot more activity in the Gulf. Mr. Thompson added that on facility side platforms, new concepts are resulting in cost savings. These include Spars, Tension Leg Platforms (TLP), Floating Production and Storage systems (FPS) and Floating Production Storage and Offloading systems (FPSO) as the major floating production concepts for deepwater, with compliant towers being the

primary bottom-founded production concept.

The resurgence in the Gulf is also substantiated by shipbuilders. "The offshore market in the Gulf of Mexico is more active now than at any period of time since the late 1970s," said an optimistic Don Covington, president of Texas Drydock, Inc. (TDI). "Capital investments in acquisitions, mergers and equipment upgrades by the major drilling contractors indicate a confidence in the continued

growth; and prices of crude and natural gas have stabilized at a level that encourages continued production."

The rig repair/conversion market was relatively flat one to two years ago, with most of the work during that time being the repair and upgrade of jack-ups. Three Gulf Coast yards — Texas Drydock, Amfels and HAM — were the primary competitors for what offshore work was available. "With the

(Continued on page 34)

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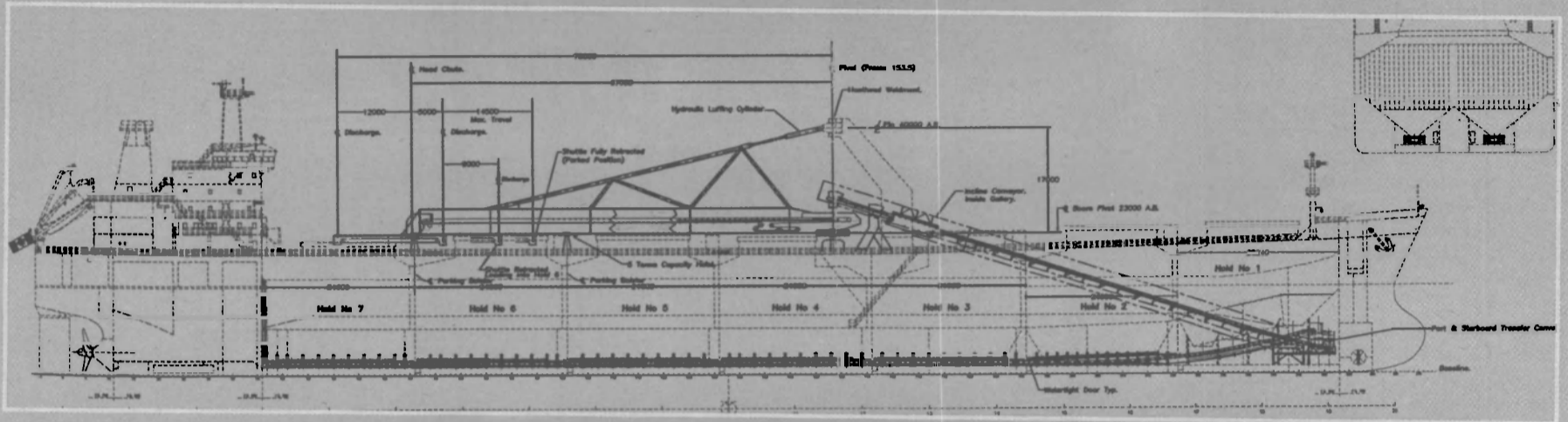
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New Generation Of Self-Unloading Cargo Ships



by Kathleen Gleaves, contributing editor

When Canada Steamship Lines (CSL) went shopping for a new generation of self-unloading bulk carriers, the company had a few basic requirements, namely: to reduce up front and maintenance costs; and to improve flexibility in cargo handling and environmental protection.

According to **Rob Jones**, president of CSL International, Seabulk Systems of Richmond, B.C., the company satisfied all of those requirements with the discovery of an innovative new design. In fact, those working closest to the project claim that this design will be the template for all self-unloading bulk carriers of the future.

Seabulk, which has designed several self-unloaders in the past, has continually battled the problems of uneven belt loading and the resultant spillage and product loss, jamming of product in the hoppers, time loss due to a mismatch of ship and shore capabilities, as well as environmental issues such as dust and noise.

Various attempts have been made to solve these problems by automating existing hopper-and-hold designs. However, according to **Sidney Sridhar**, president of Seabulk Systems, these solutions resulted in only marginal improvements. Seabulk's radical design approach reportedly solves many of the problems plaguing the industry with completely redesigned holds and delivery system.

Hopper and gate changes

Seabulk's Controlled Feeder Gate (CFG) is designed to eliminate the delivery problems inherent in the standard hopper/gate configuration. The 80-ft. (24.4-m) hoppers are open bottomed and capped

with a reciprocating panel. Each panel has eight openings, the size of which is regulated by a closure plate. Hydraulic cylinders adjust the closure plates, and hence the opening size, to control the product flow rate. Another cylinder moves the entire panel back and forth along the hopper bottom. The hydraulic system is remotely operated by a computer designed by Siemens Electric, Industrial Systems Division, of Montreal, Canada.

By continually moving the opening along the bottom of the hopper, cargo is constantly shifted, eliminating the compacting, bridging and tunneling problems associated with stationary opening. Operators will no longer have to pound the sides of the hoppers with a sledgehammer to dislodge a compacted load. Even "stickier" cargo such as wet bauxite won't present a problem, said Mr. **Jones**. Likewise, hit-or-miss methods of controlling product flow are a thing of the past. Computer analysis of flow rate based on plate opening size and product characteristics, combined with the onshore facility's receiving rate, results in a smooth, continuous offload.

Belt overloading and numerous temporary shutdowns of the onboard operation so the onshore facility can "catch-up," are bypassed. Offloading progresses at a steady, unaltered pace, programmed to adjust the vessel's transfer speed to the receiving facility's capabilities. The volume of material on the belt is controlled by the gate. Offloading rates are regulated by flow from the gate with the belts moving at a constant speed. There are two variables involved in controlling flow rate. The first is the opening size and/or number of openings. For example, to operate at 50 percent capacity, a

choice can be made to open all gates halfway, or to fully open every other gate. The second variable is the reciprocating panel speed.

The hydraulic cylinders utilized in this process are electrically controlled through a PLC (Programmable Logic Controller) designed and supplied by Siemens. Remote I/O stations are located throughout the ship. Speed control of the conveyor belt is possible, but not generally used to control the speed of the offload. Rather, when the vessel is working at a port with a limited receiving capacity where the maximum flow rate may be achieved with only minimal gate openings, the operating team may choose to slow the conveyors as an alternative method of controlling the flow rate. Slower belt speeds save some wear and tear and will reduce overall maintenance costs. Computer oversight protects against flooding the belts. Variable frequency drives and invertors control the belt speed. Computers control most of the offloading phase.

During the process, a PLC looks at the power drawn from the motor and gearbox and determines the volume of material on the belt. The predetermined offloading capacity of the delivery port is noted by the computer system which then sets the gate openings and the panel speed. Algorithms were developed to determine the flow rates of standard cargo. Because lump size and humidity are variables which may influence product flow, the computer begins each offload at 50 percent of the projected capacity, takes readings from the PLC and adjusts the gates automatically to achieve optimum speeds. A built-in memory achieves the optimum offload goal in less time on subsequent vis-

its to the same port loading the same material.

With a top-notch computer system in place, the decision was made to utilize the system to perform other tasks as well. Siemens, which specializes in alarm and monitoring systems, brought all of those functions into the computer program. Sensors installed at the bearings relay temperature information to a video display unit on the bridge for monitoring and early warning of potential problems. The system also keeps a record of alarms, motor failures and bearing temperatures to help isolate problem areas and streamline overall maintenance tasks. Another item on CSL's list of desired improvements was a clean tank top. The company wanted no barriers on the floor of the tunnel. Previously, conveyor idlers welded to the floor made washdown difficult because of build-up around the multitude of support posts. In Seabulk's design, the conveyors are suspended overhead by chains, resulting in an obstacle-free deck.

Installation of watertight hold doors, as required by IMO, proved to be another challenge met with ingenuity. The challenge laid in how to maintain an uninterrupted flow of material for the length of the hold, yet enable sealing of each of the eight compartments when necessary. Working with the other vendors, Seabulk developed a system whereby in an emergency, the belts drop to the floor, and guillotine type doors seal each hold. When the doors open, the belts return to their working position. The receiving conveyor belt transfers the product to the incline conveyor which cuts through Holds No. 7 and 8. Although this results in some slight storage space loss, at 70,800 dwt, it was decided the loss was minimal and more than

compensated for by the reduced cost and maintenance of an internal belt. The transfer system is able to achieve a steady 2,000 tons/hour offload speed. Bottlenecking at the transfer point is always a worry during offloading.

To facilitate smooth operation, infrared cameras located in the tunnel and at all transfer points, including the end of the boom, allow operators to monitor belt loading conditions from the pilot-house.

By eliminating shutdowns due to receiving hopper overfills, jammed products, or belt overloads, the system is designed to easily match the receiving capabilities of most ports. Mr. Sridhar estimates the improved delivery system will save valuable time in port, and, according to Mr. Jones, the system will "enable the crew to focus on system maintenance instead of operation."

Delivery system

Another new design feature, a 250-ft. (76-m) telescoping boom at midship, capable of 270 degree rotation, is designed to allow for greater flexibility in delivering cargo to onshore hoppers. A hydraulic actuator slews the boom. Siemens produced a design in which the actuator remains stationary while the boom rotates, propeller-style. The luffing, slewing and shuttling action of the boom are all hydraulically controlled.

According to Mr. Sridhar, "The biggest challenge of this job is the hydraulics. For hydraulics to work we need the electrical, because it all requires a 20-milliamp control signal, and that's what Siemens controls." The two companies worked closely on the control philosophy. Seabulk set forth the system requirements and Siemens developed the hardware and software utilizing PLC technology.

Environmental improvements

As more urban ports deny docking permission to bulk carriers due to dust and noise pollution, CSL wanted a system that would eliminate these restrictions. To ensure these requirements, Seabulk replaced the standard open-lattice boom with a completely enclosed boom system to contain airborne pollutants. Even the belts within the body of the ship are covered to reduce dust in the internal environment. Additional dust extraction equipment is integrated into the system throughout the ship, improving air quality for crew members.

Vibration damping on all the drives helps with noise suppression. The boom chute has a lining of sand between the inner and outer walls for additional noise abatement. An indirect benefit of careful regulation of product flow is that by eliminating overflows, pollution from spilled product is no longer a problem. With these safeguards in place, these vessels will reportedly be able to unload in any port, even congested urban loca-

tions, without dust or noise.

Selling the idea

Mr. Sridhar presented his design to CSL International in Boston. To prove it would work, Seabulk built a \$850,000, full-size prototype consisting of one complete cargo hold/hopper and conveyor. They tested gypsum in the prototype and were able to demonstrate the 2,000 tons per hour flow rate.

CSL has purchased exclusive rights to the design for a four-year

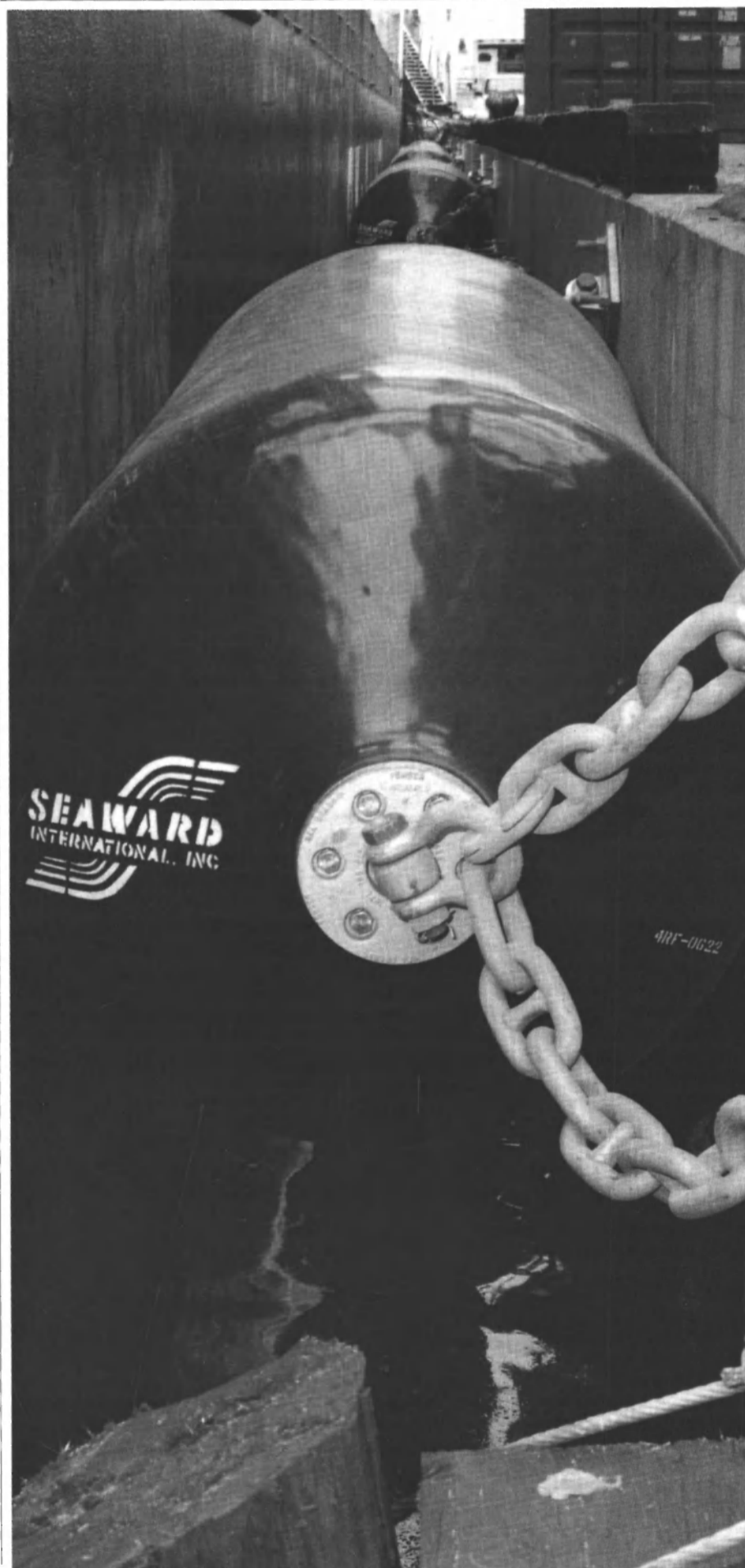
period. It currently has three ships underway at the Jiangnan Shipyard in Shanghai, China. Two of these vessels are for CSL International, and the third is for Egon Oldendorf.

The Seabulk engineer onsite during construction, which is scheduled to begin in October, will be Brian Carefoot. Seabulk subcontracted the fabrication of the boom and the feeder gates back to Jiangnan.

Other vendors include Siemens,

supplying the electrical control system; Flenders, supplying the gearbox and reducers; Continental Conveyors of Toronto, Ontario, in its first marine project, supplying idlers and pulleys; Fox Fluid Bar of Toronto supplying the hydraulic actuator; and the Walz & Krenser firm in Rochester, N.Y., designing and supplying watertight doors.

The unnamed vessel's first customer is New England Power. It will carry coal to New York in the spring of 1998.



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can be transformed close to the wellheads, distributed via a load switching module at 3.3kV, 480V and 415V to various services, and controlled remotely.

For more information on the SPEED Project
Circle 93 on Reader Service Card

MTU Supplies Large Diesel Engines For Japanese Ferry

MTU Friedrichshafen has won a contract to supply four 20-cylinder Series 1163 engines to Mitsubishi Heavy Industries to power a new 330-ft. (100-m) high-speed ferry. The operators, Higashi Nihon Ferry, expect the ferry to go into service next year, and to achieve a cruising speed of 35 knots.

Because of the rough seas on the route, the new ferry will feature a steel hull, whereas most new high speed vessels are built completely of aluminum. It will be able to carry 450 passengers and 100 cars.

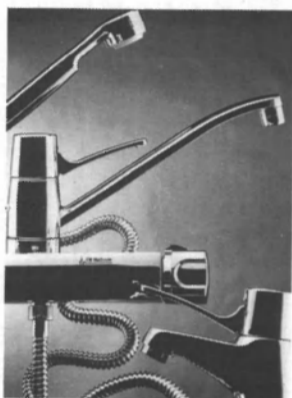
For more information on MTU
Circle 67 on Reader Service Card

Heger Dry Dock To Present Dockmaster's Training Seminar

Heger Dry Dock Engineers Inc. is hosting a Dockmaster's Training Seminar at the Norfolk Waterside Marriott in Norfolk, Va., from September 17-20.

The seminar is designed to present the latest information on drydocks and drydocking techniques. A tour of Metro Machine's 15,000-ton floating drydock has been arranged as part of the seminar. For more information contact Heger Dry Dock at tel: (508) 429-1800; or fax: (508) 429-1811.

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VT Acquires Ship Motion Control Specialist

Vosper Thornycroft Holdings (VT), a U.K. builder of naval ships, machinery controls, roll stabilizers and marine steering gear, has acquired Maritime Dynamics, Inc. (MDI), a U.S. company specializing in ride control systems for passenger and crew comfort on fast ferries and advanced vessels. VT and MDI have worked closely for several years in providing ride control systems for the latest fast passenger ferries. The partnership has supplied systems to ferries throughout the world.

"Acquiring MDI is another step in VT's move to broaden the base of the company by developing businesses which are independent of the timing of naval shipbuilding orders," said VT Managing Director **Martin Jay**.

MDI has been particularly successful in working with the Australian fast ferry builders and as a supplier to Scandinavian shipyards.

Under VT ownership, MDI will reportedly remain autonomous. MDI and VT have entered into a security agreement with the U.S. government to enable MDI to continue classified U.S. and overseas military work under its existing U.S. security clearance. VT has also declared its intention to invest further in MDI's ride control technology and to expand its worldwide presence.

For more information on Vosper Thornycroft
Circle 70 on Reader Service Card

Unitor Introduces Shipboard Polymer Repair System

Unitor has introduced a new polymer repair system, which is designed to offer vessel operators the ability to undertake emergency repairs as well as permanent repairs to pipes, all types of mechanical equipment and machinery composites, including non-weldable materials. The package contains well-tested products, and a key component of the system is a 76-page marine maintenance manual, which covers each product and type of repair, using drawings to explain repair procedures. The products in the system are compatible with all ferrous and non-ferrous metals as well as most plastics, and reportedly have been successfully used for permanent repairs.

Typical applications for the polymer repair system include: emergency repairs; situations in which hot work such as welding is not permitted; where the base material is not weldable; where distortion of the base material is unacceptable; where there is restricted workspace; where specific qualities are required; and where there is a need for non-metal repairs.

For more information on Unitor
Circle 71 on Reader Service Card

Daewoo Develops Intelligent Welding Apparatus

Daewoo Heavy Industries' Shipbuilding Division has developed what it calls the world's first single-unit intelligent welding apparatus (model DW-2000), able to perform four different types of welding, including metal inert gas (MIG) welding.

Using Micom software, the apparatus can perform general arc, CO₂, MIG and gouging welding. It features self-diagnostics and automatic control for maximum efficiency, according to the type of welding performed. It also features remote controls, designed to permit easy change from one type of welding to another.

For more information on Daewoo
Circle 72 on Reader Service Card

Cambridge Offers Heavy Fuel Solution

Cambridge Applied Systems (CAS) offers a solution which it claims will help to reduce some of the problems associated with using heavy fuel. With the significant price difference between heavy and lighter fuel oils, lower quality, high viscosity oils are commonly used in marine diesel engines. Shipowners are attracted to the less expensive fuels because engine manufacturers have, and continue to successfully develop slow and medium speed diesel engines which can operate on lower grade

fuels.

Optimizing combustion efficiency while running on lower quality fuels is essential. Failure to do so can result in excessive wear to pistons, piston heads, exhaust valves and injectors. To achieve optimum burn, it is necessary to continuously measure and control fuel oil viscosity. Viscosity-based control uses direct, continuous measurement of the fuel viscosity immediately after the fuel preheater, with continuous adjustments of the pre-

heater temperature to achieve the best viscosity. The key is having a reliable sensor, which CAS offers.

Since 1990, dozens of CAS HFO viscometers have been successfully installed on various ships, including six Sealand Services, Inc. D-9 class vessels.

In nearly every installation, the CAS viscometer has replaced an originally installed viscosity sensor.

For more information on CAS
Circle 73 on Reader Service Card

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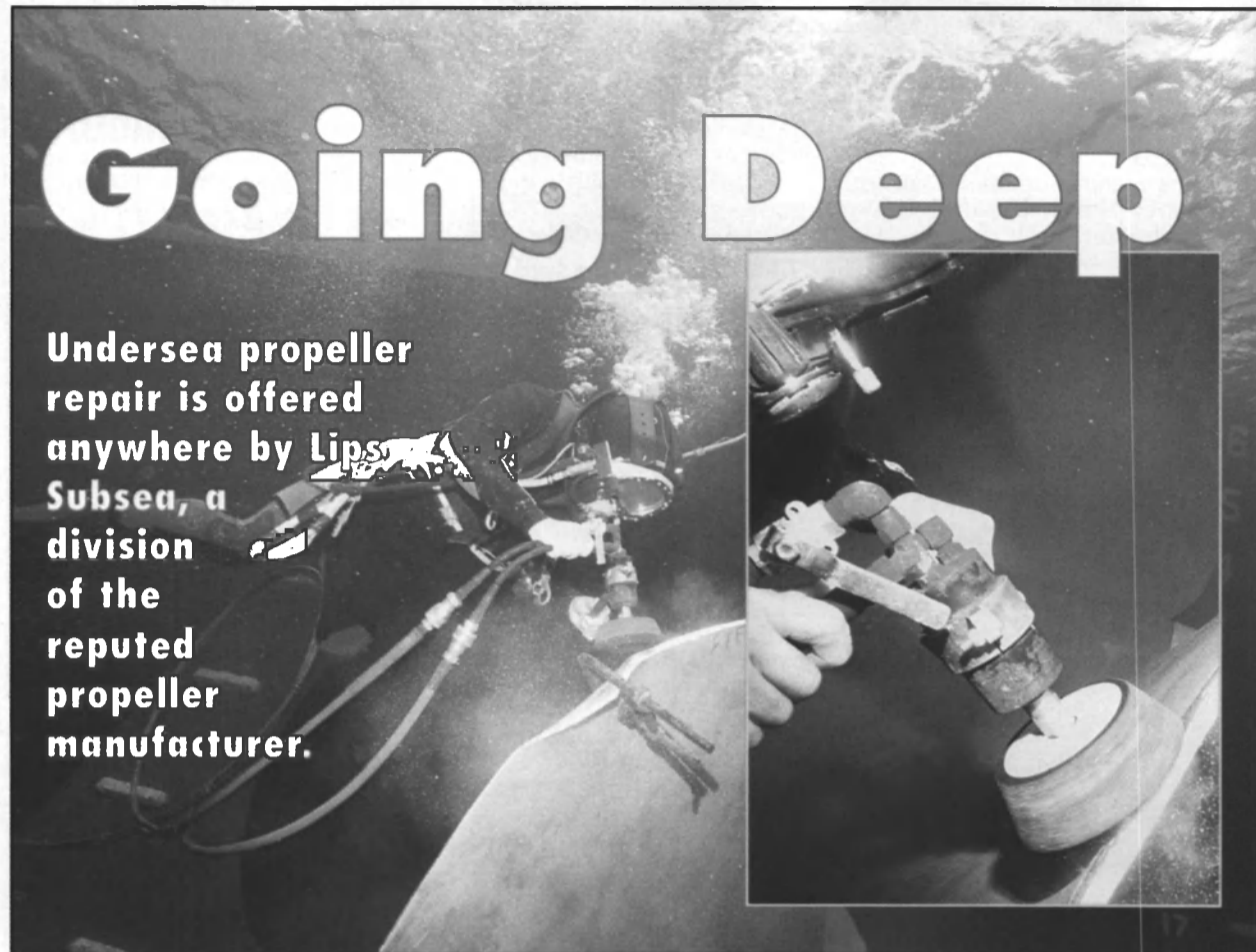
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Going Deep

Undersea propeller repair is offered anywhere by Lips Subsea, a division of the reputed propeller manufacturer.



Engineering A Solution

Key to the team's success has been the development of equipment which makes it possible to straighten major propeller bends, as well as equipment designed to dramatically shorten the time it takes to cut and grind blades.

In addition, specialized equipment and techniques were developed which enabled Lips technicians to measure propeller geometry underwater, reportedly with degrees of accuracy comparable to onshore shops. Of course, every propeller cannot be straightened, as cold straightening to class standards is only possible when there is no associated cracking. But Lips believes its specialized training provides an advantage, as its team is capable of looking for and evaluating any additional defects.

For more information on Lips Subsea
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SMOOTH SAILING

Problem: A cruise ship in Alaska encounters ice, and one of its highly skewed, four-blade props is bent aft eight in., with the bend extending 20 in. into the section.

Standard Solution: Cut off both the damaged blade and the opposite, undamaged blade, so as to restore mass balance. This decreases speed, increases fuel costs, and increases later repair costs.

Lips Subsea Solution: At 9:30 a.m., Lips engineers enter the water, and confirm the bend is free of cracks. A half-hour later, a straightening device is lowered into place. By 11:00 a.m., the Lips technician has straightened the bend and inspected the blade to confirm that there are no new cracks. That evening, the ship sails as scheduled, with normal propeller vibration reported.

Kimo Mackey is a busy guy.

He, and his "SWAT" team of divers are ready at a moment's notice to respond to calls from shipowners and operators around the world, answering the calls for help with a complete propeller repair solution.

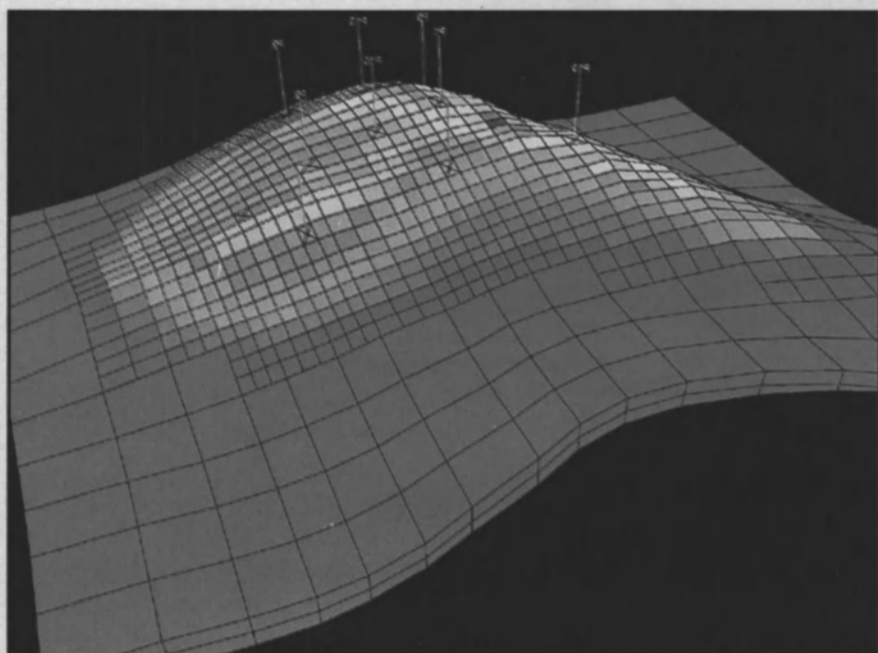
Mr. Mackey would have it no other way.

Lips Subsea — based in Poulsbo, Wash. — was formed to provide a quick, correct and cost-effective solution to propeller damage. The underwater repair team can be most anywhere in the world within 48 hours, and it provides services consistent with each individual situation.

The team promises to deliver most any major

propeller repair work, including the straightening of major bends. The company reports that the repairs are often considered by the major class societies to be 100 percent complete.

Even the most seasoned owner/operator knows that pulling a ship from service for repairs is a trying time — both mentally and financially. Lost time equals lost business, and coupled with escalating repair costs and razor-thin margins prevalent in the industry today, the event can lead to real financial disaster. Propeller damage seems to be particularly prevalent in the Pacific Northwest of the U.S., a factor which led to the base of the company.



Pictured is an illustration of 4-D, one of the new information technology services provided by Western Geophysical. The objective of this service is to provide oil and gas companies with a detailed reservoir model which allows identification of subtle changes in fluid content.

Vast opportunities for Gulf Coast

(Continued from page 29)

increased demand for drilling in deeper water, the market for semi-submersible conversions has exploded, and big rig yards are now looking at backlogs of projects that extend into late summer of 1997," said Mr. Covington.

Peter Husta, director, Sales and Marketing, for Service Marine Industries, Inc., reports similar offshore conditions. The activities in the Gulf of Mexico are increasing significantly, as evidenced by the number of working platforms and rigs in use and currently under mobilization. As of early June, 63 of the 77 Gulf platform rigs were working under contract, according to Mr. Husta.

"Our customers are busy supporting drilling activities in progressively deeper waters. They are also being called upon to support different types of activities which require them to reconfigure their ships to meet the specific needs of the oil, drilling or seismic survey company. This level of activity is much higher than we've seen in the past three to five years," said Mr. Husta.

New Technologies Spawn New Business

According to Mr. Koerber of Western Atlas, three major technologies have enabled oil companies to reduce their finding costs so much that the actual block price is less of an issue compared with three to five years ago. These technologies are: 3-D seismic, which cuts costs

Vast opportunities for Gulf Coast

by reducing the number of dry holes, thus helping oil and gas companies to understand the reservoir better and increase production over the life of the field; horizontal/multi-lateral wells, which allow to cost-effectively drain leftover pockets of oil/gas in a proven field and drain new reservoirs more efficiently; and subsea completion systems, which reduce the cost of deepwater finds. In addition, special seismic technologies such as ocean-bottom cables have made the reshooting of congested production areas efficient, while also creating long-offset data. Processing methods such as pre-stack depth migration allow for identification of prospective structures below subsalt, and 4-D, or time-lapsed reshooting of a production reservoir, will allow the monitoring of a field and optimize production.

With all the new developments occurring in the offshore market, much activity has been generated for all sectors of the industry. "They're all busy: from drilling companies to pipe suppliers; from platform operators to marine transportation companies; from boat companies to shipyards," said Mr. Charbonnet. "Drilling rigs are working at record day rates. Oil companies are contracting rigs for multi-year contracts. Older rigs are being retrofitted to increase drilling capabilities. Supply boats are being built new, as well as being refurbished and lengthened to meet the demand for deeper water drilling. New platforms are being fabricated and installed, and most of the ship and fabrication yards are full."

Another indication of increased activity is the liftboat industry. Power Offshore Services has started construction on the "next generation" liftboat, the Power 250. The company is currently building the first of three planned vessels of this class at its newly expanded shipyard, Semco, located in Lafitte, La. This vessel will reportedly be one of the largest liftboats in the world. With 250-ft. (76.2-m) legs, the Power 250 will reportedly be able to operate in 190-ft. (57.9-m) water depths. Living quarters will accommodate 66 persons, and an open deck area of 10,000-sq.-ft. will provide a deck load of 750,000 lbs. Two SeaTrax leg-mounted cranes will also be installed, each with a lifting capacity of 175 tons. "As platforms are installed in deeper water depths, those operators will need equipment available to them to service those structures. Several other liftboat operators are also apparently convinced, as there are presently four other large class liftboats under construction, and four more have been approved for a loan guarantee program by MarAd," said Mr. Charbonnet.

Western Geophysical, the seismic division of Western Atlas, is planning what is predicted to be the largest deepwater 3-D seismic survey ever conducted in the Gulf of Mexico. Dubbed Ultra Survey, the project will cover approximately

1,000 offshore blocks in deepwater areas of the U.S. Gulf of Mexico Outer Continental Shelf. Several multi-streamer, high-capacity vessels will acquire 3-D seismic data encompassing approximately 9,000-sq.-mi. off the coast of Louisiana.

In all, 93 energy companies bid more than \$700 million for licenses on 924 offshore blocks. The majority of those bids relate to blocks in the deepwater areas, almost 200 of which are located in the Green

Canyon, Walker Ridge, Atwater Valley and Mississippi Canyon regions — the prime areas to be covered by Ultra Survey. The survey is expected to be completed in less than three years, with initial results delivered to customers before the end of this year.

Spars International, a joint venture between J. Ray McDermott and Aker Oil and Gas Technology, has been awarded a contract valued at \$300 million by Chevron for the fabrication and installation of

the Genesis SPAR platform, a deepwater development in the Gulf. The hull is being built in Finland by Aker-Rauma Inc., and the deck at McDermott's Morgan City, La., facility. McDermott will install the Genesis SPAR — a steel cylinder measuring 705 ft. (214.8 m) in length and 122 ft. (37.1 m) in diameter — in 2,600 ft. (792.4 m) of water in Green Canyon 205, located approximately 150 miles south-

(Continued on page 36)

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Vast opportunities for Gulf Coast

(Continued from page 35)

west of New Orleans. This project is scheduled for completion in 1998.

According to Mr. Covington of Texas Drydock, semi-submersible and drillship conversions are underway or planned for 1996/97 for Diamond Offshore, Reading & Bates, Sedco-Forex, Sonat, Global Marine and Noble Drilling, along with several other semi-submersible contracts being considered. TDI's current backlog includes: three semi-submersible and one jackup conversion for Diamond Offshore; two jackup conversions for Noble Drilling; one jackup conversion and one jackup refurbishment for Ensco Drilling; and one jack-up refurbishment for Cliffs Drilling. Mr. Covington added that numerous other conversions for both ships and semis are planned, but have not yet reached the contracting stage.

All Well At Shell

Shell Oil Company has finalized development plans for Ursa — its \$1.45-billion deepwater project. Ursa — which will be developed with a TLP in approximately 4,000 ft. (1,219.2 m) of water — is expected to achieve record deepwater production rates of 150,000 barrels of oil and 400 million-cu.-ft. of natural gas per day. Ultimate recovery from Ursa is estimated at

approximately 400 million barrels of oil and gas equivalent.

"Ursa is another important advancement in the evolution of deepwater development," said Rich Pattarozzi, general manager of Shell Offshore Inc., Deepwater division. "The platform will be the largest structure in the Gulf of Mexico, and its individual wells are expected to produce at rates not thought possible just a few years ago."

Ursa's current development plans include as many as 14 wells, some reportedly producing with initial rates of up to 30,000 barrels of oil per day. The highest individual well rate achieved to date is approximately 13,000 barrels per day at Shell's Auger project in the Gulf.

Regulatory Hang-ups

Despite all the offshore activity taking place and planned in the Gulf, legislative obstacles must be overcome. "A lot of the industry is waiting for there to be a definition of what an offshore supply boat is when you relate it to the International Tonnage Convention," said Charles Burrell, sales manager at Leevac Shipyard Inc.

Currently, all vessels built today, intended to be used in international markets either now or in the future, need to be built to meet all international regulations (including SOLAS). But as U.S. manning requirement regulations of today

read, if a vessel is more than 500 gt, it is no longer a supply boat. Thus, the problem arises that a typical supply boat of less than 500 gt domestic may be 13,000 to 18,000 gt international. According to Mr. Burrell, this, in effect, forces builders to add tonnage steel which does nothing but cost money, in order to meet domestic tonnage requirements.

Bob Alario of Offshore Marine Service expanded on this legislative debate: "The problem is that recent ratification of the international tonnage convention has created a dilemma in that we have to comply with an International Tonnage System, but there is no domestic requirement to correspond. The international standards (effective 1994) and domestic laws and regulations are not compatible.

"We need to harmonize the two through the U.S. Coast Guard Authorization Bill which is presently stalled in service. We need this bill passed in order to set up alternate tonnage measurements for offshore vessels without confusion with respect to building and manning the vessels.

"Right now we are in a twilight zone where we can not make business judgments with respect to which rules and statutory roots determine what a vessel can be, should be, and will be. Considerable amounts of construction are being held up because you need to be two contradicting

things," said Mr. Alario. At press time, Mr. Alario was hopeful that before its August recess, Congress would take action and pass the provisions needed in order to design and construct the offshore vessels of the future.

While definitive questions in the market remain, industry leaders agree on a positive future for the offshore market in the Gulf of Mexico. "As to the future, we take our cue from the drilling contractors who, at this time, are highly optimistic. It is obvious that unless they (industry leaders) have totally misjudged the future market, they are not investing hundreds of millions of dollars based on short-term prosperity," said Mr. Covington. According to Mr. Charbonnet, with world consumption of oil increasing at the rate it is, the industry must continue to find large produceable sources to meet the demand.

There will be a lot of activity just completing the current work in progress, as well as the recent announcements of deepwater discoveries in the Gulf. Mr. Husta offered a positive summation of the market's future: "I personally believe that this level of activity will be sustained for a while. There are a significant number of offshore blocks which have yet to be worked. The level of seismic survey activity indicates that there should be a continued effort to hit 'pay' in the Gulf of Mexico over the near term."



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Gladding-Hearn Shipbuilding delivered its second high-speed whale watching craft, the new 365-passenger catamaran *Friendship V*, to Bar Harbor Whale Watch Co.

The 112-ft. (34-m) vessel was designed by Incat Designs of Sydney, Australia, and is designed to reach 31.5 knots loaded. It achieves this power with four 12V-92TA DDEC Detroit Diesel engines, turning Hamilton HM461 waterjets through Reintjexgears.

For more information on
Gladding Hearn
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For more information on ABS
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August, 1996

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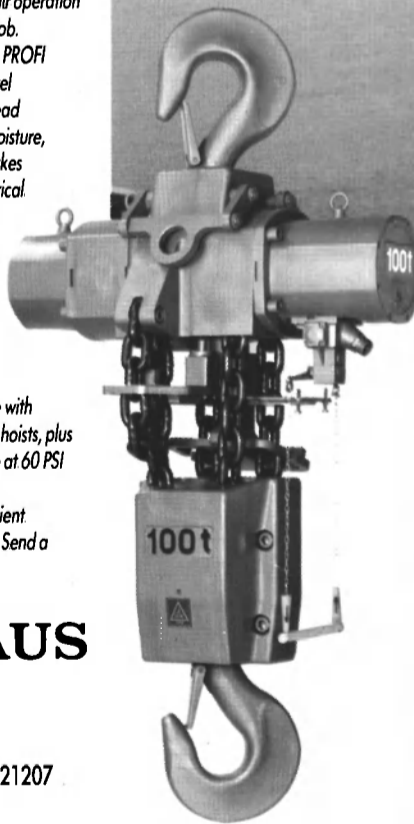
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AFSB-7/9208
Ser 212/1114
18 November 1997

From: Commander, Charleston Naval Shipyard
To: J.D. NEUHAUS, Baltimore, MD 21207
Subject: DELIVERY OF TWO 100 TON PNEUMATIC OPERATED CHAIN HOISTS ON CONTRACT N00612-87-T531
Encl: (1) NAVSHIPED CHAS Photograph of New AFSB-7 Crane Lift in Holy Loch Scotland (3 copies)

1. The purpose of this letter is to commend your Mr. Donald T. Plettenberg for his dedicated support and exemplary performance in the handling of many details for delivery of the two 100 ton chain hoists on our Contract N00612-87-T531. NAVSHIPED Charleston appreciates the quick action and delivery in support our schedule for loading the two new portal cranes and shipment to Holy Loch.

2. Enclosure (1), shows the new (310 ton lift) cranes being moved in Holy Loch by SMIT International floating crane, TAK LIFT-6 to US Navy Drydock, USN LAG ALAMUS (AFSB-7). Your 100 ton pneumatic powered chain hoists are used to level the new portal cranes so that the sixteen wheels will land on the rails simultaneously. The project was a great success as one new crane was loaded in the morning and the other one in the afternoon.

3. Please present one of these photographs to Mr. Plettenberg with our sincere appreciation for a job well done.

A. H. ANDERSSON
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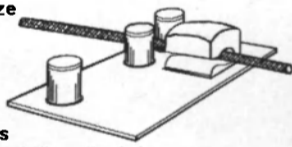
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• MR/EN REVIEW •

Deck Machinery & Cargo Handling Equipment

Allied Systems Company

Allied Marine Crane Division of Allied Systems Company designs and manufactures marine duty hydraulic cranes and boat davits. The company recently supplied equipment for U.S. Coast Guard (USCG) WLB and WLM buoy tenders, Canadian Navy frigates, ROK Navy vessels, and the U.S. Army and Navy. Allied is also manufacturing five deck cranes for the USCG's polar icebreaker *Healy*. Allied has reportedly supplied more than 100 of its constant tension winch systems for use on RIB handling davits.

Circle 96 on Reader Service Card

Aquamaster-Rauma

In the past years, Aquamaster-Rauma contracted six sets of hydraulic RAUMA anchoring and mooring winches for 29,000-dwt oil/product tankers to be built at Kherson Shipyard, in the Ukraine. The Rauma product range includes electrically and hydraulically driven deck machinery for all applications.

Circle 57 on Reader Service Card

Bloom Mfg. Inc.

Bloom Mfg. Inc. has introduced its new 1000K and 1000KC series hydraulic cable winches with fail safe brakes. Safety and speed were designed into these compact hydraulic winches. The new winch design includes a spring applied, hydraulic release safety brake which automatically holds the load when hydraulic pressure is released and a double counter balance valve which adds additional holding capacity by locking the hydraulic oil in the motor.

Circle 47 on Reader Service Card

Clarke Chapman Canada

Clarke Chapman Canada is the Canadian arm of Rolls-Royce Materials Handling Ltd. The group specializes in materials handling projects, systems products and after-market support for ports, terminals, marine and offshore industries. Current involvement includes bulk materials handling contracts in South Africa, India, China and

Egypt, as well as operating concessions in Argentina and France. Recent installations include a turnkey coal handling terminal in Liverpool, U.K.; an aluminum handling system in Mumansk, Russia; and the Clyde submarine base in Scotland, where a Sycrolift shiplift system and five high-integrity dockside and overhead cranes were supplied.

Circle 100 on Reader Service Card

Cross Equipment, Ltd.

Cross Equipment, Ltd. of Houma, La., serves the needs of the oil and gas industry providing both used and remanufactured marine and deck machinery. The company's inventory consists of new surplus and used winches, cranes, deck machinery and other related equipment.

Some of Cross' recent projects include the delivery of one remanufactured Mitsubishi A&R winch to be installed on a pipe laying barge for J. Ray McDermott. In addition, Allseas has also taken delivery of a remanufactured Mitsubishi A&R winch for installation onboard the pipe laying vessel *Solitaire*. One recently completed project involved a four point mooring system consisting of Manitawoc 390s, installed on a dive support vessel for American Oilfield Divers (AOD).

Circle 85 on Reader Service Card

D.P. Manufacturing

D.P. Manufacturing produces more than 500 hydraulic planetary winch models with line pulls up to 100,000 lbs. The company also manufactures winch/bumper kits, capstan drives, swing drives, gearboxes, brakes, valves and other related products.

Circle 53 on Reader Service Card

Jeamar Winches Inc.

Jeamar Winches has extended its WG series of hand winches to six models with line pulls from 550 to 11,000 lbs. Automatic load activated braking is standard on all models, which reportedly enables the load to be held in any position and prevents recoil of the handle. The WG series conforms to DIN standards, is extremely rugged,

and designed for heavy duty application.

In addition, Jeamar also offers a complete line of double swivel directional blocks for use with wire rope. Seven sizes are available with working load limits from 3,500 to 41,000 lbs. The sheaves are cold formed from high quality steel and fitted with lifetime lubricated, sealed bearings.

Circle 55 on Reader Service Card

Hyde Products Inc.

Hyde Products produces a full line of standard and customized marine deck machinery and winches. Systems available include horizontal and vertical anchor windlasses, capstans and winches for various applications. Models available can be built either to applicable U.S. MILSPEC or to commercial standards.

Hyde has been supplying MILSPEC deck machinery to the Korean Navy, under license agreements, since 1980. Hyde supplied roller chain stoppers to Newport News Shipbuilding (NNS) for use with the anchoring systems on its strategic sealift conversion vessels.

Hyde offers full service hydraulic system overhaul capabilities. Specialities include rework of Lassman hydraulic cylinders, winch modifications and overhauls, steering gear power units and cylinder maintenance, as well as windlass overhauls.

Circle 52 on Reader Service Card

IHI

IHI supplies deck machinery and cargo handling equipment worldwide. Its product line includes single, double, combined, hose handling and gantry cranes, as well as winches.

All IHI products are subject to thorough quality control, from materials use to machining and assembly processes. Cranes are tested before shipment in the presence of both users and classification surveyors.

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Intercon

Intercon's marine products and manufacturing services cover a wide range of markets including offshore oil, marine transportation and the mili-

DECK MACHINERY & CARGO HANDLING EQUIPMENT REVIEW

tary sector. Backlog reportedly includes six shipsets of 57-ton twin boom cargo crane components for new strategic sealift ships (TAKR). Boom and platform assemblies are scheduled to be delivered to NASSCO and Avondale.

Commercial activity centers on Intercon's proprietary connection technology for articulated tug/barges. The Intercon coupler has been ordered for Bouchard's new 10,000-hp ATB, under construction at Trinity. Reportedly, Amoco Transportation has ordered two Intercon coupler systems and Penn Maritime of New York has ordered a third Intercon coupler system for a new Eliza class ATB.

Circle 50 on Reader Service Card

Lake Shore Inc.

Lake Shore Inc. has joined a full service contractor team led by Ingalls Shipbuilding Division of Litton Industries, which is competing for the LPD construction contract.

Lake Shore specializes in the design, manufacture and testing of

various types of deck machinery and material handling systems for military and commercial markets. The company provides onsite personnel acting as members of an integrated product team to develop the designs and requirements for various material handling and deck machinery systems.

Circle 54 on Reader Service Card

Liebherr-Werk Nenzing GmbH

Liebherr's C-type shipboard cranes — CBW, CB, CBM, CBG — have reportedly proven to be successful in all fields of modern cargo handling. The company has recently designed the new CBS series of cranes, specially suited for multi-purpose and heavy-load vessels.

Circle 101 on Reader Service Card

Markey Machinery Co., Inc.

Markey Machinery Co., Inc. builds all types of custom marine deck equipment including towing,

research, mooring, escort tug hawser winches, traction systems, windlasses and capstans. In the last year, Markey has reportedly delivered three traction winch systems and six CTD winches to Trinity Marine for installation on the new AGOR class research vessels. Each winch system includes complete controls and instrumentation.

A double drum tow winch was built for Bouchard Transportation, and Wilmington Transportation purchased a single drum hawser winch for its converted combi-tug *San Pedro*.

Current projects include tow winches for American Offshore and Bouchard Transportation, and a complete shipset of deck equipment for the new Crowley tractor tugs.

Circle 48 on Reader Service Card

McElroy Machine & Manufacturing Co., Inc.

McElroy offers a complete line of winches, hoists and capstans.

Additionally, the company specializes in the manufacture of custom winches and other marine deck equipment. The company's product line includes anchor windlasses, storage reel and specialized deck machinery.

Circle 61 on Reader Service Card

Morgan Marine, WRM Inc.

Morgan Marine, WRM Inc., distributes a wide range of hydraulic articulated and telescopic marine cranes. Capacities range from 9,500 ft./lb. to 210,000 ft./lb. These lightweight, high-capacity marine cranes reportedly stow compactly, yet offer reach and capacities utilizing modern hydraulic systems and high strength steel fabrication design.

Circle 51 on Reader Service Card

Morris Mechanical Handling

Morris Mechanical Handling, part of P&H Materials Handling, is involved in the manufacturing of ship-to-shore gantry cranes, rubber tyred gantries (RTG) and rail

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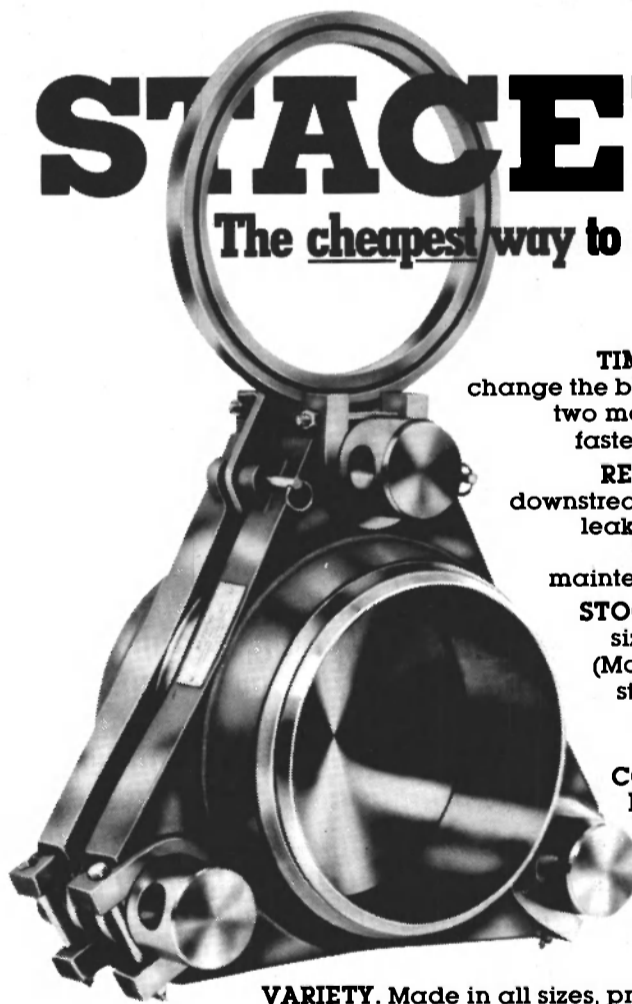
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August, 1996

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Circle 233 on Reader Service Card

DECK MACHINERY & CARGO HANDLING EQUIPMENT REVIEW

mounted gantries (RMG). The company's products are reportedly in use worldwide, including in the Ports of Charleston and Houston.

Circle 45 on Reader Service Card

P&H Material Handling

P&H Material Handling manufactures overhead cranes, portal cranes, hoists, electric motor controls and brakes. The company also offers modernized and reman-

ufactured equipment, repair parts, maintenance service, and equipment installation and inspection, in addition to engineering consulting service.

Circle 56 on Reader Service Card

Rapp Hydema AS

Rapp Hydema AS is a developer of mechanical equipment for, among other users, fishing fleets. The company specializes in

hydraulic deck machinery and integrated, automatic control and monitoring systems. In addition, Rapp Hydema delivers trawl, seine, anchor/mooring and towing winches; fishpumps; power blocks; and net and rope reels.

Circle 60 on Reader Service Card

Smatco Industries, Inc.

Smatco Industries, Inc. offers a standard line of winches with mod-

els ranging in size from 10,000 to 2 million lb. line pull anchor handling and towing winches. Smatco has expanded its winch product line to include other deck machinery such as windlasses, capstans, tuggers, stern rollers, fairleaders and deck sheaves. In addition to the winch lines, Smatco also has its own line of pipe handling equipment for offshore operations.

In the first quarter of this year, Smatco delivered what was reportedly the largest anchor handling winch ever built to Ensco. The Smatco model 140-EAW-1000/1000 was installed onboard M/V *Kodiak I*. This mega-winch has a line pull of one million lbs. on each drum at the same time, for a combined total of two million lbs. of line pull, and can reportedly hold more than 10,000 ft. (3,048 m) of 3-in. wire rope on each drum. Smatco has reportedly received approval to build another 140-EAW-1000/1000 anchor handling winch for Ensco Marine.

Circle 86 on Reader Service Card

Smith Berger Marine, Inc.

Smith Berger Marine, Inc. of Seattle is a provider of mooring hardware for wire and chain. In addition to the standard fairleads and deck sheaves available out of stock, Smith Berger engineers maintain a steady flow of innovative products such as chain stoppers of all types, including a recent shipment of 12 double pawl stoppers. The double pawls reduce the contact stresses in the chain by half, and are situated so they ratchet as the chain is hauled in. This ratcheting feature is reportedly advantageous, as it ensures that the chain is positively secured if there are interruptions during the in-haul procedure.

Circle 46 on Reader Service Card

TCW Marine, Inc.

TCW Marine, Inc. of Newport Beach, Calif., is the HIAB seacrane distributor for the U.S. models range from the small model 11 seacrane to the model 870, which is reportedly capable of lifting more than 56,000 lbs. Recently completed contracts include cranes for Bermuda Biological's *Weatherbird II*; USNS *Tags 63*; NOAA's *Ka'Imimoana* (three cranes, one A-frame and one J-frame); Oceanering International; Mar, Inc.; and the Johns Hopkins Applied Physics Lab. TCW also manufactures deck machinery.

Circle 49 on Reader Service Card

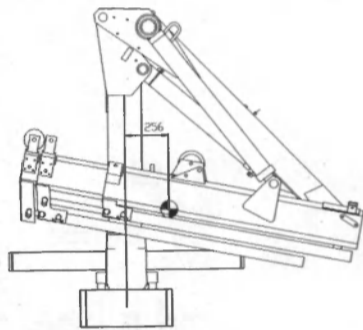
Techrane

Techrane International Inc. — marketing company for EBI Cranes — has provided an EBI model TC20-33-60 marine crane for service onboard M/V *Hadi III*. The vessel is one of several supplied by Master Boat Builders of Bayou Labatre, Ala., to Hadi H. Al-Hammam Est. of Saudi Arabia.

Techrane has also supplied three

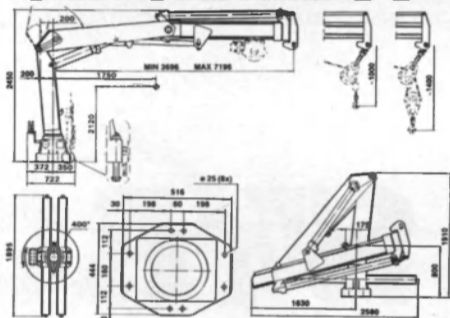
TCW MARINE, INC.

HIAB SEA CRANE 45



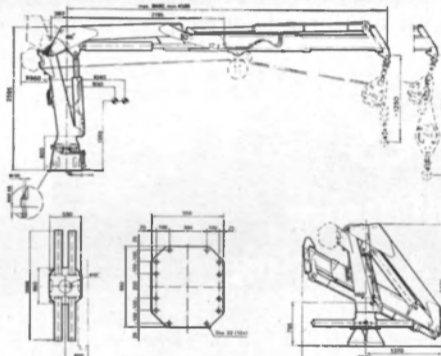
REACH: 4'11" 19'7" 15'1" 19'7"
CAPACITY: 4170 LBS. 3000 LBS. 2090 LBS. 1500 LBS.

HIAB SEA CRANE 80



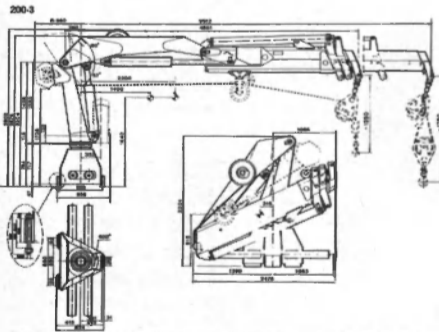
m	1.8	3.5	5.2	7.0	9.1	10.9
kg	4100	2200	1480	1080	700	500

HIAB SEA CRANE 120



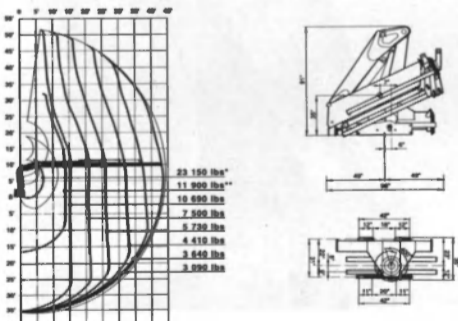
m	2.0	4.3	6.3	8.2	10.5	12.5
kg	5300	2650	1800	1380	850	600

HIAB SEA CRANE 200



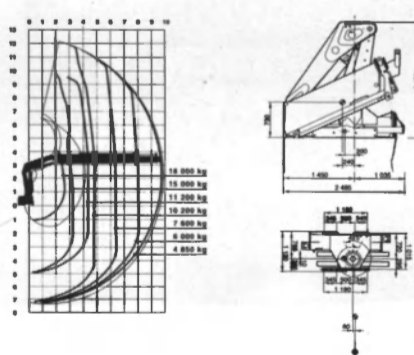
m	2.0	4.6	6.1	7.8	9.8	11.8	13.7	15.7
kg	9400	4300	3250	2550	1880	1500	1230	1040

HIAB SEA CRANE 250



kg	23,100	11,900	10,600	7,300	5,700	4,410	3,650	3,000
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HIAB SEA CRANE 480



kg	18,000	13,000	10,000	7,000	5,000	4,000
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TCW MARINE, INC.

1607 Port Barmouth Place

Newport Beach, California 92660 U.S.A.

714 • 747 • 6025 Phone • 714 • 720 • 0413 Fax

Circle 300 on Reader Service Card

DECK MACHINERY & CARGO HANDLING EQUIPMENT REVIEW

Owen Short Marine for installation onboard U.S. Coast Guard self-propelled buoy tenders.

Circle 58 on Reader Service Card

Thern Inc.

Thern Inc., a manufacturer of industrial quality winches, hoists and cranes, offers a product line which includes spur and worm gear hand winches with capabilities up to 5 tons; electric, pneumatic and hydraulic powered winches with capacities up to 25 tons; and deck mounted davit cranes with capacities up to 2,200 lbs. Thern has redesigned its entire line of power winches, introducing more than 100 new standard production models.

Circle 87 on Reader Service Card

J.D. Neuhaus Hebezeuge GmbH & Co.

J.D. Neuhaus Hebezeuge GmbH & Co. (JDN) specializes in all types of

lifting equipment. All JDN crane systems are equipped with tested technology and are tailored to fit individual space requirements and to lift and transport heavy loads. The drive medium is either compressed air, hydraulic fluid or electric current. JDN crane systems are alternatively equipped with rope or chain hoists in trolleys.

Circle 102 on Reader Service Card

Timberland Equipment Limited

Timberland designs and manufactures a variety of winches including anchor, mooring and towing winches. Winches are available with diesel, electric or hydraulic drives. New product introductions for 1996 include a double drum anchor/towing winch with 200,000 lb. line pull and rope capacity to suit customer requirements. Power units can also be supplied to meet speed performance requirements.

Circle 104 on Reader Service Card

Fetterolf Corporation

Fetterolf Corporation manufactures line blinds for marine services, including for ocean-going product carriers and tankers, as well as oil and chemical barges. These blinds are used to isolate holds, preventing cross-contamination and assuring there is no leakage from the holds.

Circle 105 Reader Service Card

McElroy and BP Join Forces

McElroy Machine and BP oil have teamed up to build mooring winches for two of BP's oil tankers which will transport oil from Alaska to Japan. The winches are of a self-contained electro hydraulic design. The 125-hp water/explosion proof units reportedly develop 60,000 lb. of line pull at 40 fpm and haul in light line at 110 fpm. Split drums hold 1,000 ft. (304.8 m) of 1.75 in. wire rope with 900 ft. (244.3 m) on the storage side and 100 ft. on the working section,

and are fitted with brakes rated at 192,000 lb. The McElroy model DMMW556-125 winch is completed by a single 27-in. CAT head. ABS reportedly witnessed the rigorous testing at the factory test facilities.

Cargo Pumps Receive Japanese Contract

Svanehøj International, a Danish electric drive deepwell cargo pump supplier, has reportedly received Japanese recognition in an order from Daiichi Tankers. The contract is for deepwell cargo pumps for use in *Star Phenix*, a 3,000-sq.-m. LEG carrier built for ISC shipyard in Japan, as well as for an 11,000-dwt molten sulfur carrier which has been built at Shin Kurushima Dockyard Co. Ltd. in Taihei, Hiroshima Prefecture. Daiichi Tankers is also using Svanehøj pumps on a 6,450-sq.-m. LEG carrier being built at Korea's Hyundai Heavy Industries.



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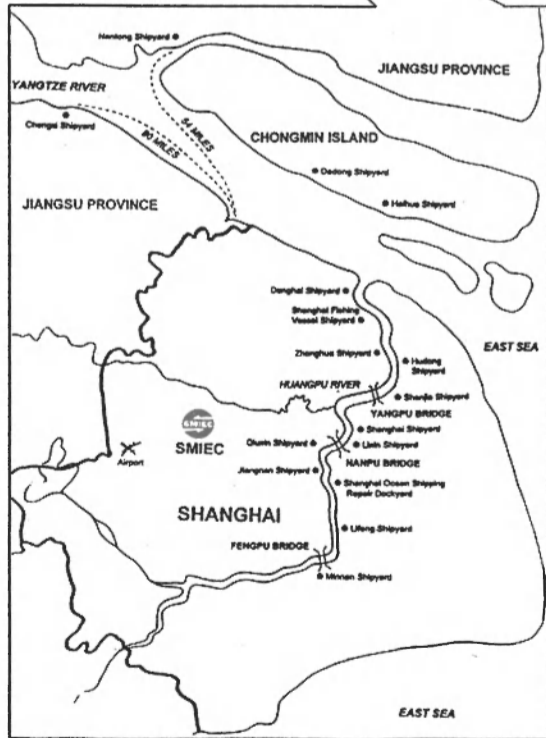


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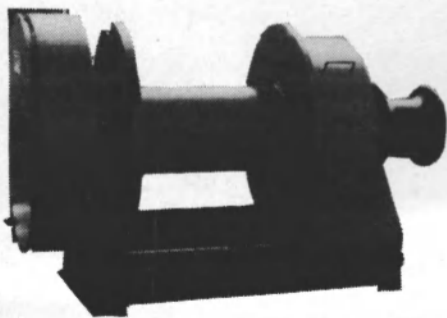


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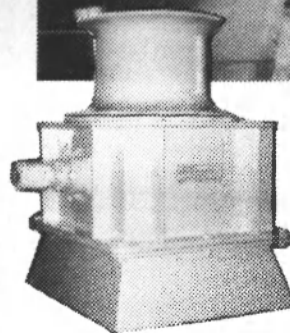


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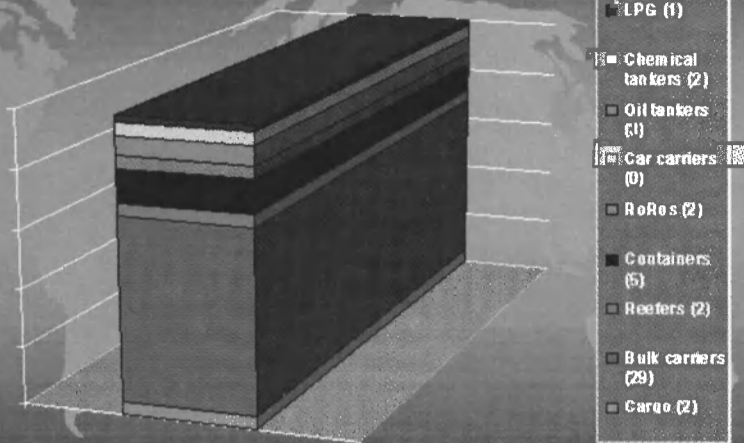
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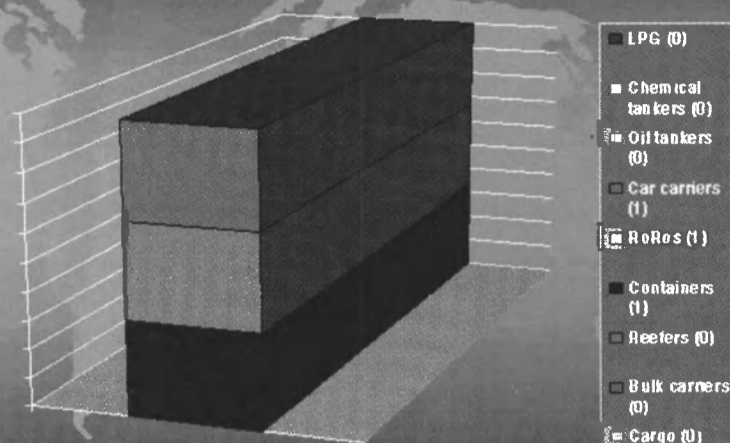
New Orders for Japanese Yards

(For Export: Total = 46)



New Orders for Japanese Yards

(Domestic: Total=3)



USCG Publishes Proposed Rulemaking For Towing Vessels

In the interest of improved safety, the U.S. Coast Guard (USCG) announced a proposal on July 12 focused on tightening licensing and manning on towing vessels. The proposal would create new licenses with additional levels of qualifications, calls for enhanced training and more operating experience and requires practical demonstrations of towing skills. The rulemaking stems from findings of the investigation into the AMTRAK rail disaster that claimed 47 lives near Mobile, Ala., in September 1993. The USCG concluded that improvements in licensing, training and qualifications of towing vessel officers could reduce the number of marine accidents associated with these vessels.

According to USCG officials, the proposal resulted from an extensive, cooperative effort with representatives of the towing industry. The proposal was published in the *Federal Register* on June 19 as a notice of proposed rulemaking. Written comments must be received before Oct. 17 and should be addressed to the Executive Secretary, Marine Safety Council, (G-LRA/3406), Docket #94-055, USCG Headquarters, 2100 Second Street, S.W., Washington, D.C. 20001. Written comments may be delivered between 8 a.m. and 3 p.m. Monday through Friday to Room 3406 at the same address.

For additional information or copies of the notice, interested persons should call Lt. Cmdr. **Don Darcy**, project manager, Office of Environmental Standards, at (202) 267-0221, or fax a message to him at (202) 267-4570.

Power Alliance Wins DARPA Contract

On July 11, an alliance consisting of Lockheed Martin, Ingalls Shipbuilding and Newport News Shipbuilding was awarded a \$1-million contract by the Defense

Advanced Research Project Agency (DARPA) and the U.S. Navy to provide initial design concepts for the Arsenal Ship program. The team will reportedly be led in the initial phases by Lockheed Martin Government Electronic Systems, of Moorestown, N.J.

This contract is the first element of a six-phase program, which is planned to ultimately include construction of arsenal ships — floating missile batteries with as many as 500 vertical launch missiles that could be directed against multiple threats from another ship,

from aircraft, or from land-based control sites. Ship design plans call for the incorporation of stealth technology for improved survivability, and highly automated control systems for reduced crew levels and lower operating costs.

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Circle 262 on Reader Service Card

Russian-Norwegian Venture Awarded 3-D Contract

Petroleum Geo-Services ASA announced that Exxon Neftegaz Limited awarded a major 3-D marine seismic contract to a Russian-Norwegian joint venture between Dalmorneftegeofizika Trust (DMNG) and PGS.

The work, which reportedly has already begun, is being performed

in the Sakhalin - 1 and Sakhalin - 3 areas, offshore Sakhalin, Russia. The 3-D acquisition will be executed by the Russian high technology vessel *Orient Explorer*, owned and operated by DMNG. Large scale 3-D processing using IBM parallel supercomputers and PGS' proprietary 3-D software will be undertaken onboard the seismic vessel. PGS owns the majority of the seismic equipment onboard the vessel.

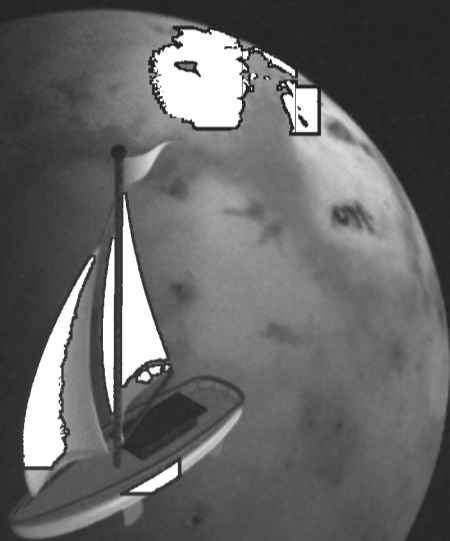
This contract reflects the

DMNG-PGS commitment to the region, with a seismic vessel that has been upgraded to the highest industry standards. The award also represents a breakthrough for DMNG-PGS' efforts, which are focused on providing high-tech seismic solutions to a number of major field development projects currently underway in Sakhalin. PGS is dedicated to this region and intends to deploy whatever equipment the oil industry demands to

assure the successful rapid development of the existing reserves.

This contract award follows the announcement made by Exxon Corporation on June 10, that an agreement had been reached by the Sakhalin - 1 consortium and the Russian government to formally declare the Sakhalin Production Sharing Agreement effective and begin the evaluation work on the estimated \$15 billion Sakhalin - 1 project. The Sakhalin - 1 consortium is proceeding rapidly by acquiring this 3-D dataset, with plans to drill at least one well during 1996.

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Global Marine Awards \$6 Million Contract

Houston, Texas-based Stewart & Stevenson Services, Inc., a manufacturer of diesel and gas turbine powered equipment, announced that its Petroleum Products Division was awarded a \$6-million contract for the delivery of a marine riser system for deepwater drilling. This new generation marine riser system, which forms an extension of the well bore from the ocean floor to the drilling rig, was contracted by Global Marine Drilling Company. The riser system will reportedly be used on Global's Glomar Celtic Sea drilling rig, which will be operating in 5,000 ft. (1,524 m) of water in the Gulf of Mexico.

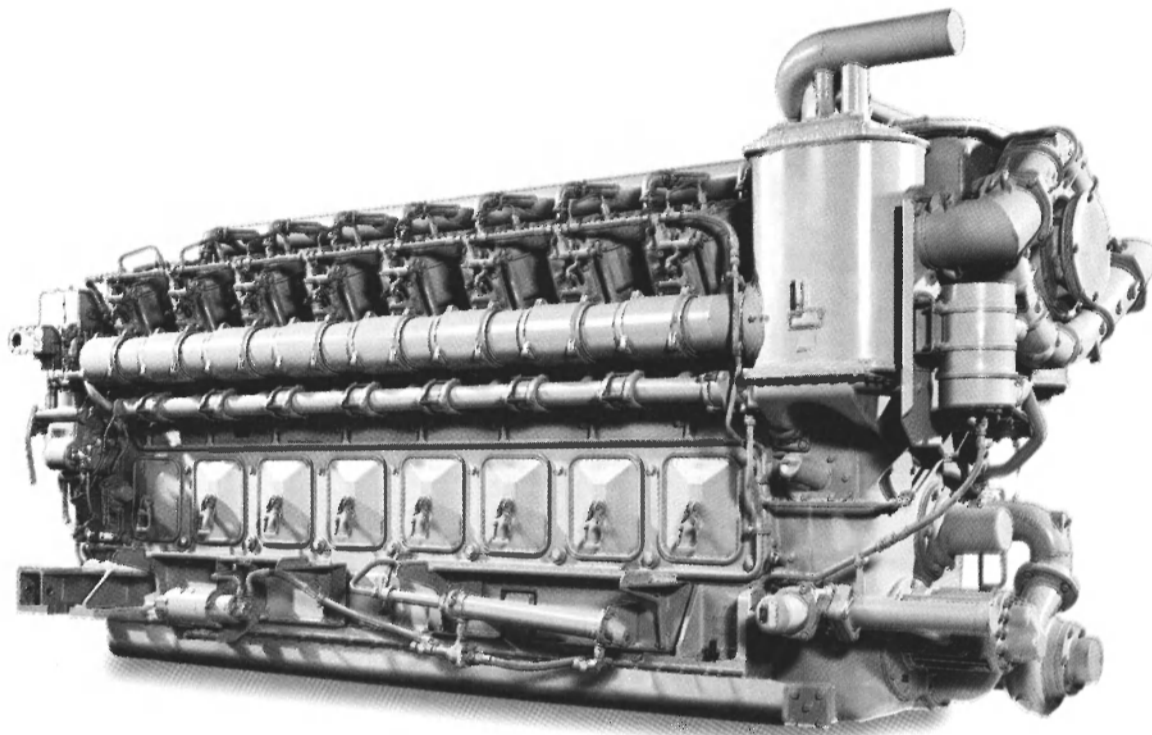
Satcom Business Transferred To Hughes Technical Services

The MAGNAPhone satellite communications business unit, acquired by Hughes Aircraft Co. with its 1995 purchase of Magnavox Electronic Systems Co. (MESOC), is being transferred to Hughes Technical Services Co. (HTSC). The former Magnavox unit manufactures and markets marine and land-mobile satellite terminals for use with the global Inmarsat network, under the trademarked MAGNAPhone brand name.

The MAGNAPhone business unit, formerly a part of Magnavox West Coast Division based in Torrance, Calif., is being split off from the rest of MESOC and merged into HTSC, where there is a better organizational and technological fit for its Inmarsat maritime and land-based terminal product lines. The personnel, inventory and equipment of the MAGNAPhone unit will be shifted to the Hughes facility in Long Beach by the end of the year. Until then, the group will continue to work out of the Magnavox facility in Torrance, which is about eight miles from HTSC Long Beach.

Magnavox has been one of the leading suppliers of Inmarsat terminals for marine and land markets, with an installed base of more than 5,000 units.

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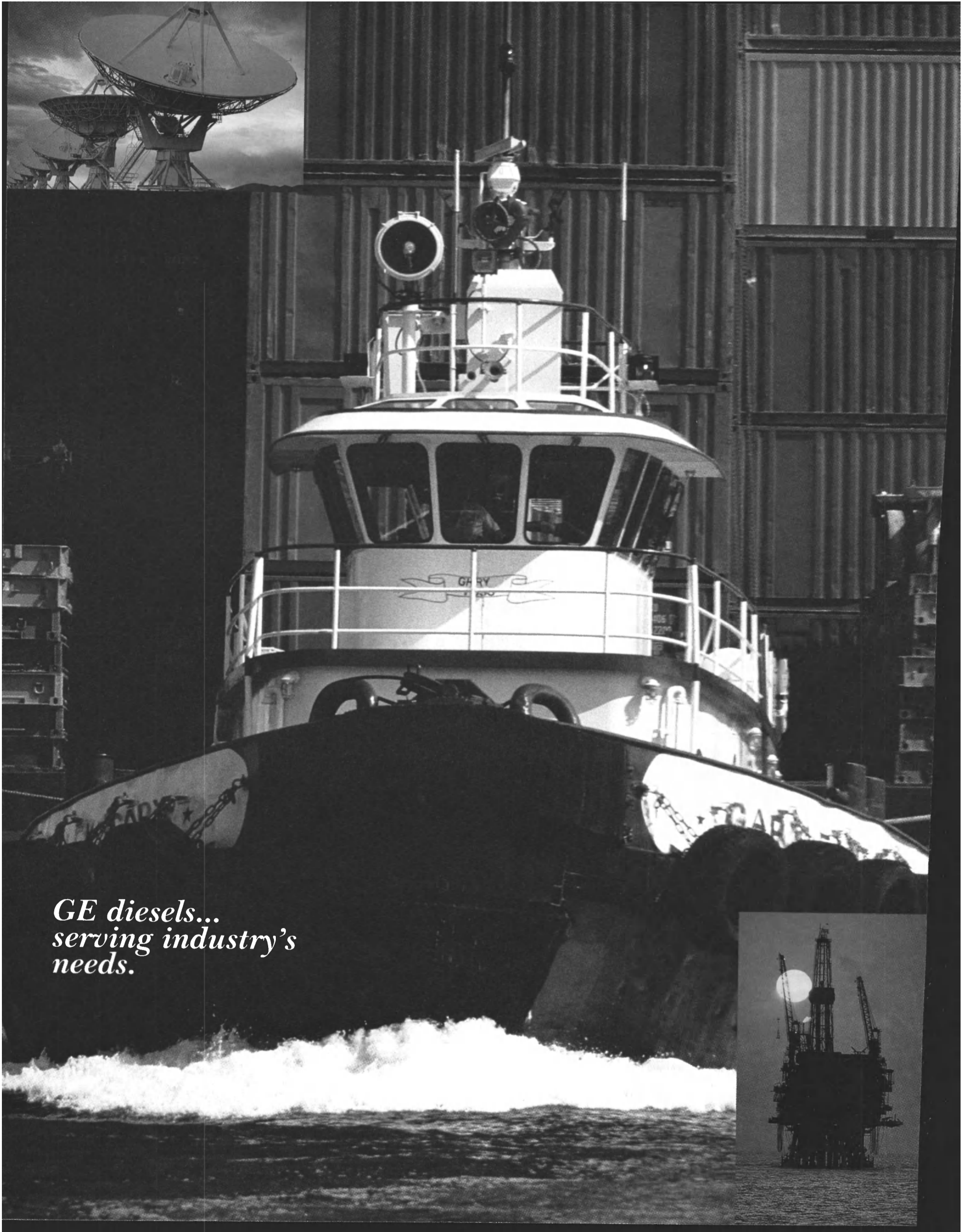
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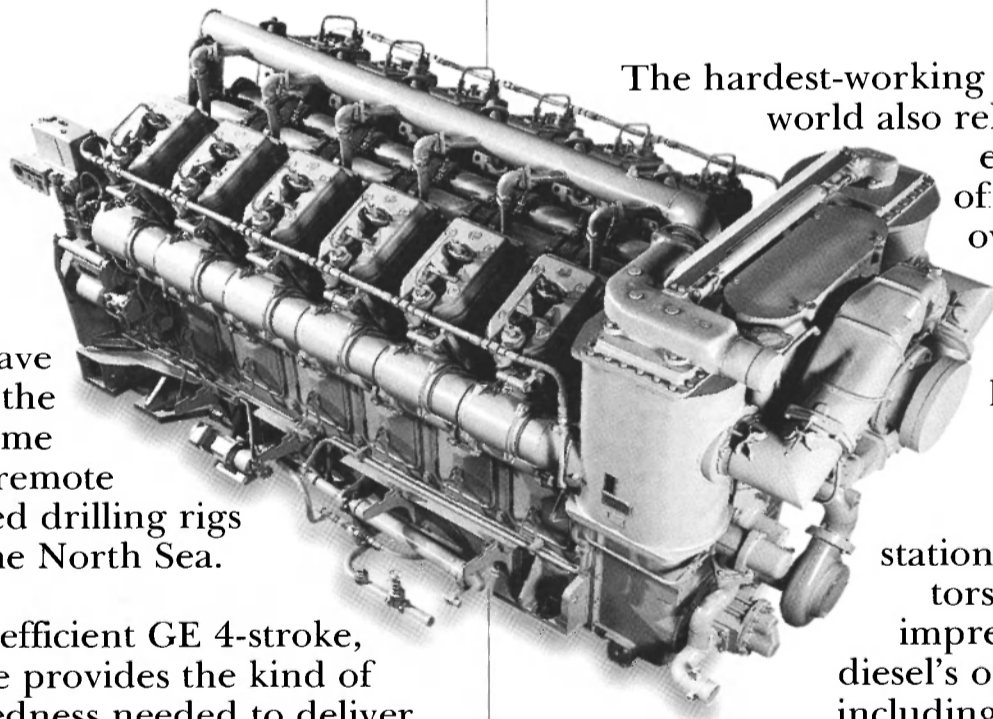
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You probably know GE diesels from the railroads—over 13,000 GE diesel engines have been proven in rigorous service around the world. GE diesels have also been providing the power to solve extreme service problems at remote land sites and isolated drilling rigs from Patagonia to the North Sea.

The inherently fuel-efficient GE 4-stroke, turbocharged engine provides the kind of versatility and ruggedness needed to deliver dependable base load, peaking and emergency power under severe service conditions. Full parts standardization and

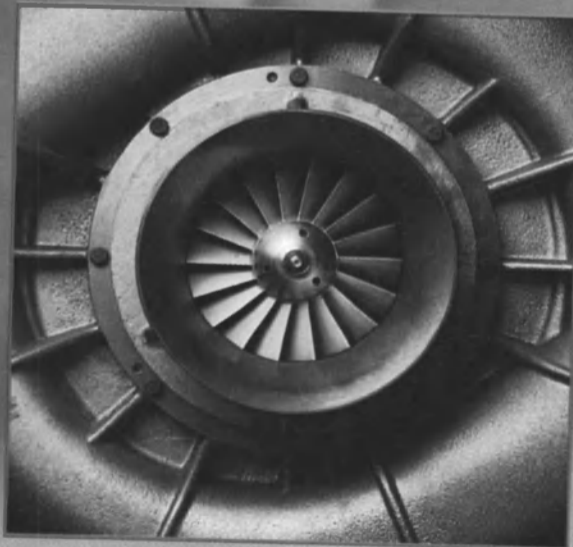
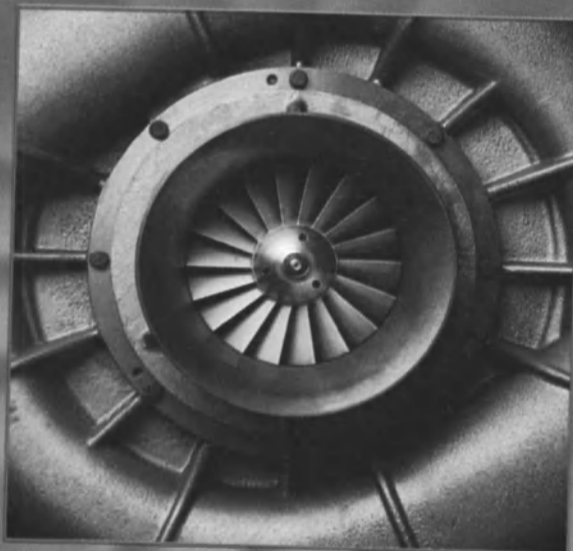
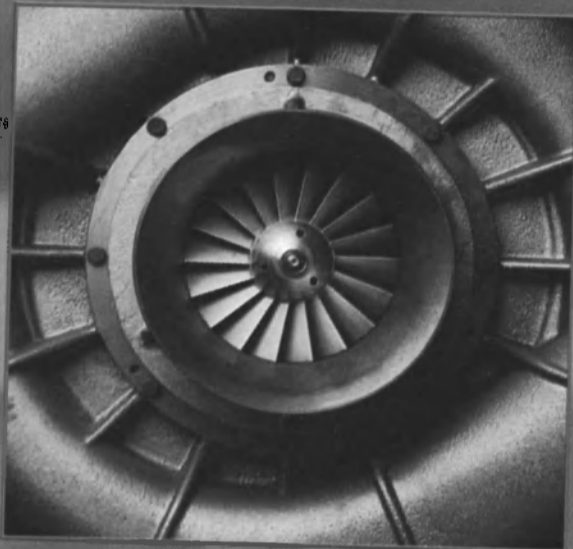
easy parts accessibility built-in to every GE diesel makes for unmatched maintenance simplicity—another big benefit in severe service locations.

Marine power to make work boats work harder—on blue water and brown.



The hardest-working boats around the world also rely on the reliable, economical power of GE diesels. Boat owners and operators worldwide appreciate the 2,000 to 4,000 horsepower these engines turn out at 900 to 1,050 rpm. Like stationary power operators, they are equally impressed with the GE diesel's operating benefits, including the long service, superior availability and minimum operating costs that come from simplified maintenance and low parts usage.

We have the power
to make you
look good.



GE Diesel

Circle 337 on Reader Service Card

Exxon Fast Track North Sea Development Greenlighted By British Government

On July 23, Exxon Corporation announced that the British government has approved plans for fast track development of the Curlew field in the Central North Sea. Use of a converted tanker as a Floating Production Storage and Offloading (FPSO) facility will allow the \$450-million project to be brought on stream in record time.

Exxon's U.K. affiliate, Esso Exploration and Production U.K., Ltd., holds a 50 percent interest in Curlew, which is located about 130 miles east of Aberdeen, Scotland. Shell U.K. Exploration and Production also owns a 50 percent interest and is the operator.

Total recoverable reserves are estimated to be about 125 million oil equivalent barrels, over half of which are liquids. The project will develop two oil and gas accumulations.

First production from Curlew is expected in the fall of 1997, less than eighteen months from the award of the FPSO contract, and three years after discovery of the second accumulation. At its peak, oil production is projected at 45,000 barrels per day, and natural gas at 100 million standard cu. ft. per day.

John H. Steele, managing director of Esso Exploration and Production U.K., said, "The Curlew development marks a significant step in the current phase of North Sea development. The project

team has been able to make it commercially viable thanks to the innovative combination of an aggressive timetable, tight control of costs, and conversion of an existing tanker to an FPSO vessel. We are confident that the team will meet this challenging schedule while maintaining high quality and safety standards."

The tanker to be converted is

the 100,000-ton *Maersk Dorset*. Once completed, the Curlew FPSO will be able to store 560,000 barrels of oil. The FPSO will be leased from MAS Production Company, a subsidiary of Maersk Company Ltd. U.K., which has subcontracted the conversion work to several U.K. and European contractors.

The Curlew FPSO will be the second for the Esso/Shell venture

in the Central North Sea. The first is *Anasuria*, which is scheduled to begin producing in the Teal and Guillemot fields by the fourth quarter this year.

Oil from the Curlew field will be exported via shuttle tankers, while natural gas will be transported via a new tie-in to the existing Fulmar pipeline flowing to the St. Fergus terminal in Scotland.

Sulzer Engines To Be Fitted On RoRo, Containership Newbuilds

Two 23-knot RoRos ordered in Italy by Tor Line will be powered by twin Sulzer 9ZA50S medium speed diesels. These are the first orders for the new engine design, which was introduced in October 1995 by New Sulzer Diesel Ltd. of Winterthur, Switzerland. Fincantieri has been tasked with building the vessels, which will be in operation between Gothenburg and Ghent, Belgium, and between Gothenburg and Immingham in the U.K.

Each engine has a combined maximum continuous output of 21,600 kW at 450 rpm, and will drive twin CP propellers. The engines will be built under license at the Trieste works of the Diesel Engine Division of Fincantieri, which, as a group, is one of the joint shareholders in New Sulzer Diesel.

New Sulzer has also received the first orders for its new RTA96C large bore, low speed diesel engine, which provides up to 65,880 kW, and was specifically designed for the new generation of larger, faster containerships. Two 11-cylinder engine models will be installed on a 5,750-TEU containership building at Ishikawajima-Harima Heavy Industries Co. Ltd. (IHI) for NYK Line.

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- ◆ No relocking minimizes cone failure and provides unbeatable productivity.
- ◆ 700,000 C5AM-DF's are now in use worldwide. The latest addition to the list of users is Maersk Line.
- ◆ Major ports prefer the C5AM-DF for its safety and productivity.

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Circle 253 on Reader Service Card

Safety/Claims Seminar Planned For September

The American Club has scheduled its annual Safety/Claims Seminar to be held at the Grand Bay Hotel in Coconut Grove, Fla., on September 11. Experts will address a broad range of topics, including oil spills and cleanup costs, investigating maritime personal injury claims, criminal liability in maritime accidents, environmental damage calculations, and the benefits of arbitration/mitigation in lieu of litigation. Among those speaking will be representatives from NOAA, the International Tankers Owners Pollution Federation Limited (ITOPF), and the National Pollutions Funds Center. Contact **Don Moore** at tel: (212) 908-2411.

Caterpillar Seeks to Acquire Krupp Engine Business

Caterpillar Inc. signed a memorandum of understanding with Fried. Krupp AG, whereby Caterpillar will acquire the shares of Krupp's German-based diesel engine subsidiary, MaK Maschinenbau GmbH. The acquisition is reportedly subject to Caterpillar's completion of due diligence, and to final approval by the companies' boards and appropriate regulators. A final agreement between the two parties is expected to be reached in the third quarter. "MaK's product line represents the state-of-the-art in large diesel engines, and would be a natural extension of the upper end of Caterpillar's diesel engine line," said **Donald G. Western**, Caterpillar vice president with

responsibility for the Engine Division. He said that Caterpillar would retain the MaK brand name and operate the company as a distinct unit in association with its engine business.

NYK Orders MAN B&W Engines For Containerships

Three 5,750-TEU containerships ordered by Nippon Yusen Kaisha


(NYK) of Japan will be powered by MAN B&W Diesel's 12K90MC low speed engines. Two vessels will be built by Mitsubishi Heavy Industries (MHI), and Mitsui Engineering and Shipbuilding (MES) will build the third vessel, as well as the three engines.

MAN B&W claims that this order underlines the popularity of large bore MC designs for containership propulsion, extending the reference list for 80MC or 90MC sales in this market to 208 engines.


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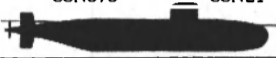




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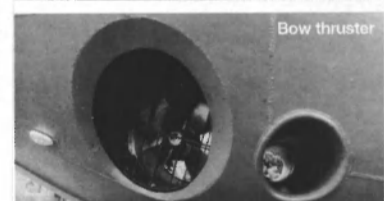
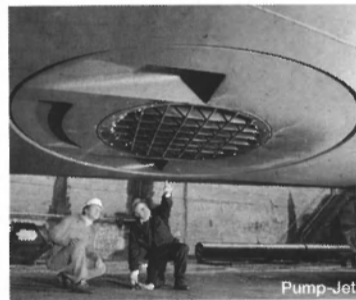
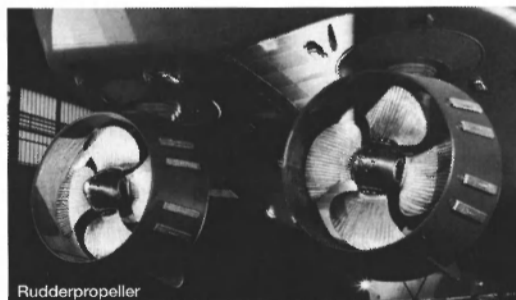

Circle 222 on Reader Service Card

Sea Transport delivers insight on changing industry

In a rapidly evolving industry, *Sea Transport* (4th ed. 1995) offers its readers roots, delivering a meticulous synthesis of past, present and future trends in the maritime transport industry. With a brief introduction of the types of vessels, terminology and crews that make up the seafaring industry, *Sea Transport* delves into more contemporary issues, such as the environment, that are forcing the marine industry to adapt to new regulations. However, it does not lose sight of traditional industry concerns, such as economics. A plethora of statistics, graphs and charts, along with an examination of the economics that govern the industry, fill *Sea Transport* with information that shipowners and consumers need to know. *Sea Transport* acts more like a handbook than a text, making it an excellent reference guide for even the most experienced seafarer. Yet it avoids maritime jargon, so it can be understood by those who have little knowledge, or are just inquiring about the maritime industry.

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Circle 224 on Reader Service Card

Mackay Introduces NERA Worldphone Office

Mackay Communications has presented the NERA Worldphone Office (Mini-M Inmarsat terminal), which reportedly provides access to international dial-up telephone, fax and data networks. The key features of the product include: 4.8 Kbps voice; a rechargeable NIMh battery and charger integrated in the phone; and a SIM card for personal mobility, management and authentication. Options include prepaid minutes, call forwarding, short message service (SMS) and voice/fax mail.

Hitec To Supply Oil Loading System For Brazilian Offshore Operation

Hitec Marine, formerly Marine Consulting Group (MCG), has been awarded a contract to provide an oil loading system for Petrobras' Marlin field offshore Brazil. The contract is for the supply of a complete offloading and tandem mooring system for the ship *Cairu*. The ship will be converted into a mobile production unit at Astilleros Espanoles' Cadiz yard in Spain.

Oceonics Completes Geophysical Survey For Proposed Container Port

Oceonics Singapore, part of Oceonics' worldwide group, has recently completed a high resolution geophysical survey for the proposed new container port at Pasir Panjang. The project was contracted by the Port of Singapore Authority (PSA) following Oceonics' initial survey of approximately 600 km in 1994.

The most recent project involved the use of boomer and sparker systems on separate passes and 16.4-ft. (5-m) line separations for observing details of the limestone bedrock, and mapping the limestone top and its contact with adjacent rocks and sediment, in order to locate cavities with a diameter in excess of 2 meters. Use of the company's MN8 DGPS system ensured the necessary positional accuracy for this objective.

Intermarine USA Wins RIB Contract

Savannah, Ga.-based Intermarine USA will develop a 35-ft. (10-m) rigid inflatable boat (RIB) prototype for the Naval Special Warfare RIB (NSW RIB) program. This contract was awarded in late June by the U.S. Special Operations Command, and upon completion, the prototype will be evaluated in a test against several other prototypes at MacDill Air Force Base in Florida. The winner of these tests will reportedly receive a contract to supply up to 24 of the vessels a year through 2002.

Intermarine's design uses fiber reinforced plastic (FRP) foam cored hull construction with twin marine diesels. With a waterjet propulsion configuration, the RIB will reportedly be capable of speeds in excess of 50 knots. It is equipped with its own purpose-built trailer, and the boat/trailer combination is air transportable in military airlift cargo craft.

Oceaneering To Survey Japanese Coastal Wreck

Houston-based Oceaneering International announced the award of a contract by the U.K. Department of Transport and the European Commission to perform an initial survey to locate and identify the stern section of M/V *Derbyshire*. The purpose of inquiry is to determine the actual cause of the vessel's loss, which has been the subject of ongoing debate since the ship sank in 14,107.4 ft. (4,300 m) of water off the coast of Japan in 1980, with extensive loss of life.

Subsidiary Oceaneering International Services Ltd. will perform the contract, which is to involve deployment of the company's Magellan 825/DOSS system from M/V *The Performer*. Oceaneering initially located and positively identified the wreck in 1994, using the Magellan 725 and Ocean Explorer 6000 search system. Oceaneering is an advanced applied technology company that provides engineered services and hardware to customers in the marine and other harsh environments.

Maritime Reporter/Engineering News

COATINGS & CORROSION CONTROL

Barton Mines Corporation

Circle 19 on Reader Service Card

Barton Mines Corporation is a supplier of garnet industrial abrasives including Barton GMA garnet, which is designed to be a cost-effective, ultra-low dusting and environmentally safe blasting media. GMA garnet is suitable for multiple usage and can reportedly be recycled five times or more without losing its cutting ability. Barton GMA garnet is approved under U.S. Navy Specification MIL-A-22262B(SH) as well as the California Air Resources Board.

Progressive Products, Inc.

Circle 25 on Reader Service Card

Progressive Products offers the TFT line of solvent-free epoxies. Bio-Gard 251 and Bio-Dur 561 both reportedly have the ability to be applied underwater. Bio-Dur 561 also passed both ANSI and ASTM 3911 Criteria for DBA and radiation, as well as Decon at 95 percent removal. Similar to Bio-Dur 561 is Bio-Dur 560, a thinner version of the same product. Bio-Gard 251 contains a Kevlar micro-fiber reinforcement that Bio-Dur 561 and Bio-Dur 560 do not have.

Biotherm 453 is a three-part epoxy created to provide a durable, single application coating and insulating system. Biotherm was originally designed for deck-mounted chemical tanks in order to replace the rock wool insulation and protective outside jacket now in use. Biotherm has one-half the insulating properties of fresh, undamaged rock wool and reportedly absorbs less than one percent of its weight in water when submerged for over 14 days.

Belmont Metals, Inc.

Circle 21 on Reader Service Card

Belmont Metals, Inc., a diversified manufacturer of nonferrous metals and alloys since 1896, has been a leading manufacturer of zinc cathodic anodes for over 50 years. Its plant features state-of-the-art quality control to help assure optimum anode performance.

Belmont offers a new data sheet which describes standard anodes for cathodic protection of marine structures, for compliance with MIL-A-18001, ASTM 8, or other requirements. Custom formulas, shapes, sizes, and straps are also available to help protect against corrosion of boat, ship and submarine hulls and other structures exposed to salt water and salt air.

Esgard, Inc.

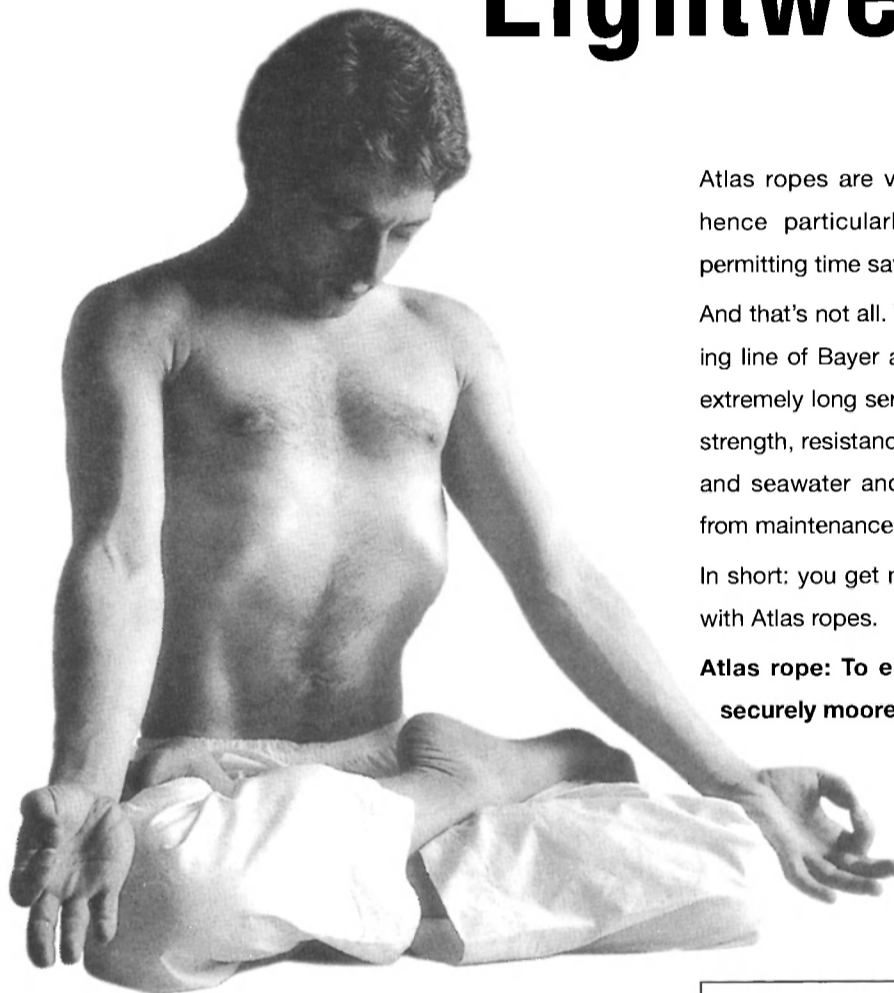
Circle 22 on Reader Service Card

Esgard, Inc. formulates and markets coatings for industries requiring

maximum protection from corrosion. The 'P' preservatives are used for preservation of gears, transmissions, engines, steam turbines, automotive parts, and other machined metal items during man-

ufacture, shipping, storage and construction. Qualified to MIL-C-16173E specifications, the products are VOC complaint, reportedly easy to remove, safe and economical.

Lightweight

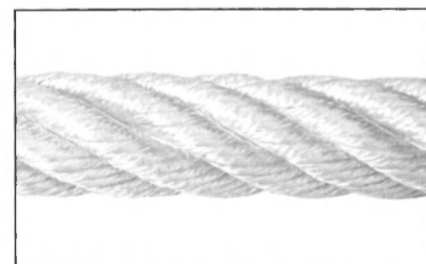
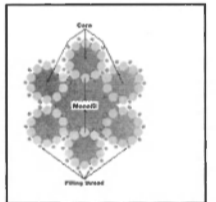


Atlas ropes are very lightweight and hence particularly easy to handle, permitting time savings of up to 50%.

And that's not all. The high-tech mooring line of Bayer additionally offers an extremely long service life, high tensile strength, resistance to alternate flexing and seawater and complete freedom from maintenance.

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Bayer at the internet: <http://www.bayer.com>

Circle 331 on Reader Service Card

COATINGS & CORROSION CONTROL

Esgard also offers Bio Kote, a "semi-hard" coating for ballast and void areas of marine vessels. It has reportedly earned type approval from ABS, DNV, Lloyds Register and Germanischer Lloyd. Bio Kote sales, service and application are available worldwide.

Chesapeake Specialty Products

Circle 23 on Reader Service Card

Chesapeake Specialty Products, Inc. offers a new reference tool

based upon a systems approach to surface preparation in *New Construction and Repair of Steel Ships*. This guide is designed to reduce generated abrasive waste and to eliminate dust emissions, thus solving one of the most costly problems of open air blasting oper-

ations.

Corrosion Control International, L.L.C.

Circle 24 on Reader Service Card

Following the issue of a U.S. patent in July 1995, Corrosion Control International L.L.C. (CCI), was established to develop and produce multi-layer wraps for bridge and jetty piles and offshore platform risers, and for corrosion-related consultation. The pile and riser retrofit splashzone and sub-sea corrosion control systems are available in several designs, providing active protection by utilizing chemical corrosion inhibitors contained within the one-piece construction.

Ervin Industries, Inc.

Circle 26 on Reader Service Card

Ervin Industries is a producer of cast steel shot and grit abrasives used in recycle blast cleaning operations. A three-year capacity expansion program is now being completed for the U.S. steel abrasive production facilities. In addition, Ervin has introduced the first cast stainless steel shot production facility in North America. Cast stainless shot is a new recyclable abrasive for special blasting needs.

Target Coatings

Circle 27 on Reader Service Card

Target Coatings, a manufacturer of water-based wood finishes for luxury marine applications, will be introducing a complete line of water-based topside paints for commercial marine and luxury yacht applications.

The WB-8000 Series Waterborne Topside Paint System is a new series of high gloss paints that will be used on new construction and maintenance applications where corrosion and chemical resistance are mandatory. The WB-8000 Series is formulated for direct-to-metal, fiberglass, composite and wood applications. The new line is designed to reduce VOC emissions and solvent exposure to the workforce and environment.

Wasser High-Tech Coatings

Circle 28 on Reader Service Card

Wasser High-Tech Coatings, Inc. is a producer of single component, moisture-cure urethane high performance coatings for marine, offshore, industrial and hydro paint-

(Continued on page 60)

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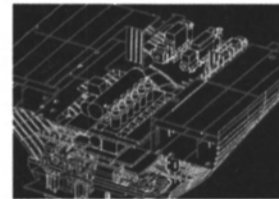
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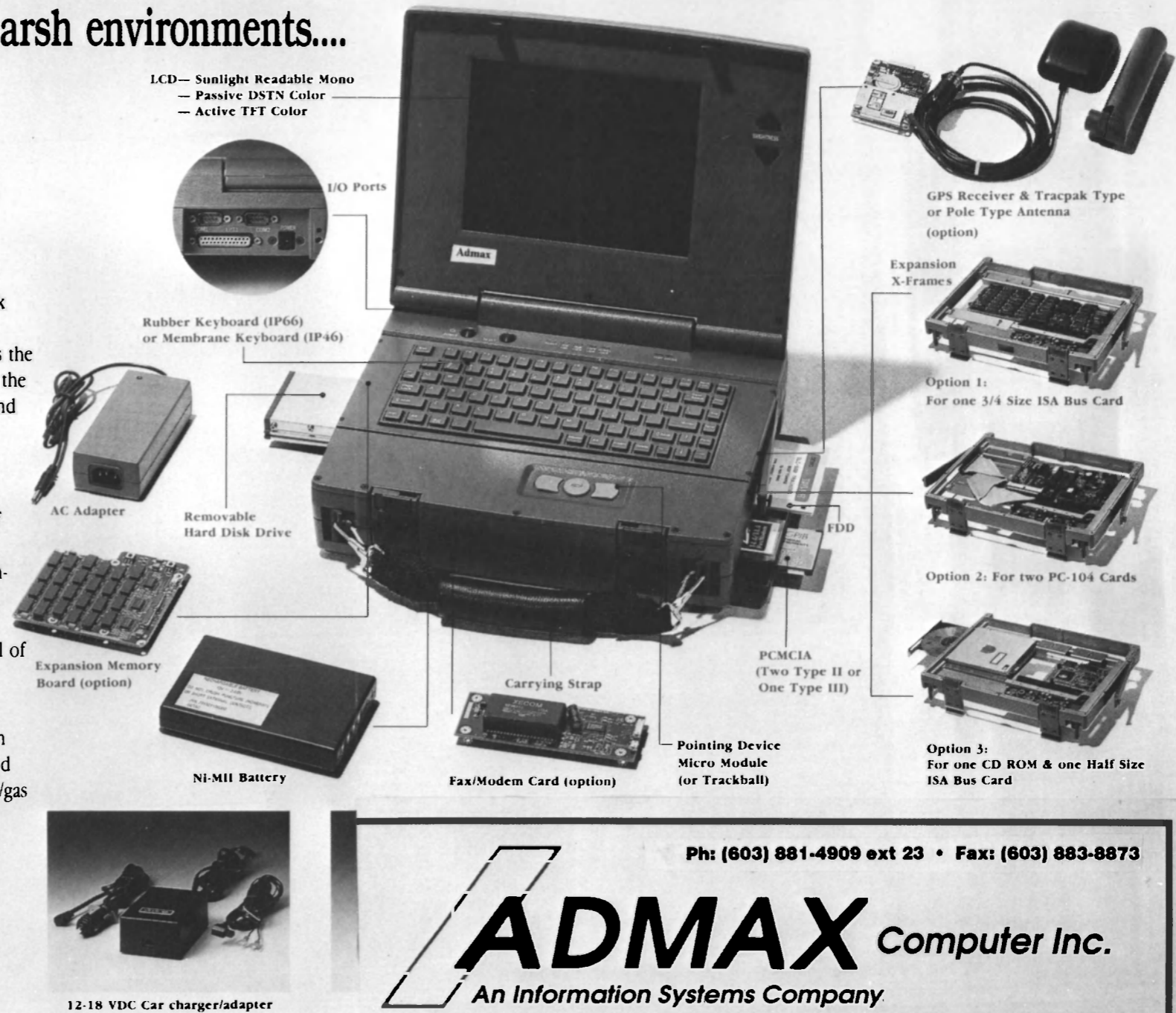
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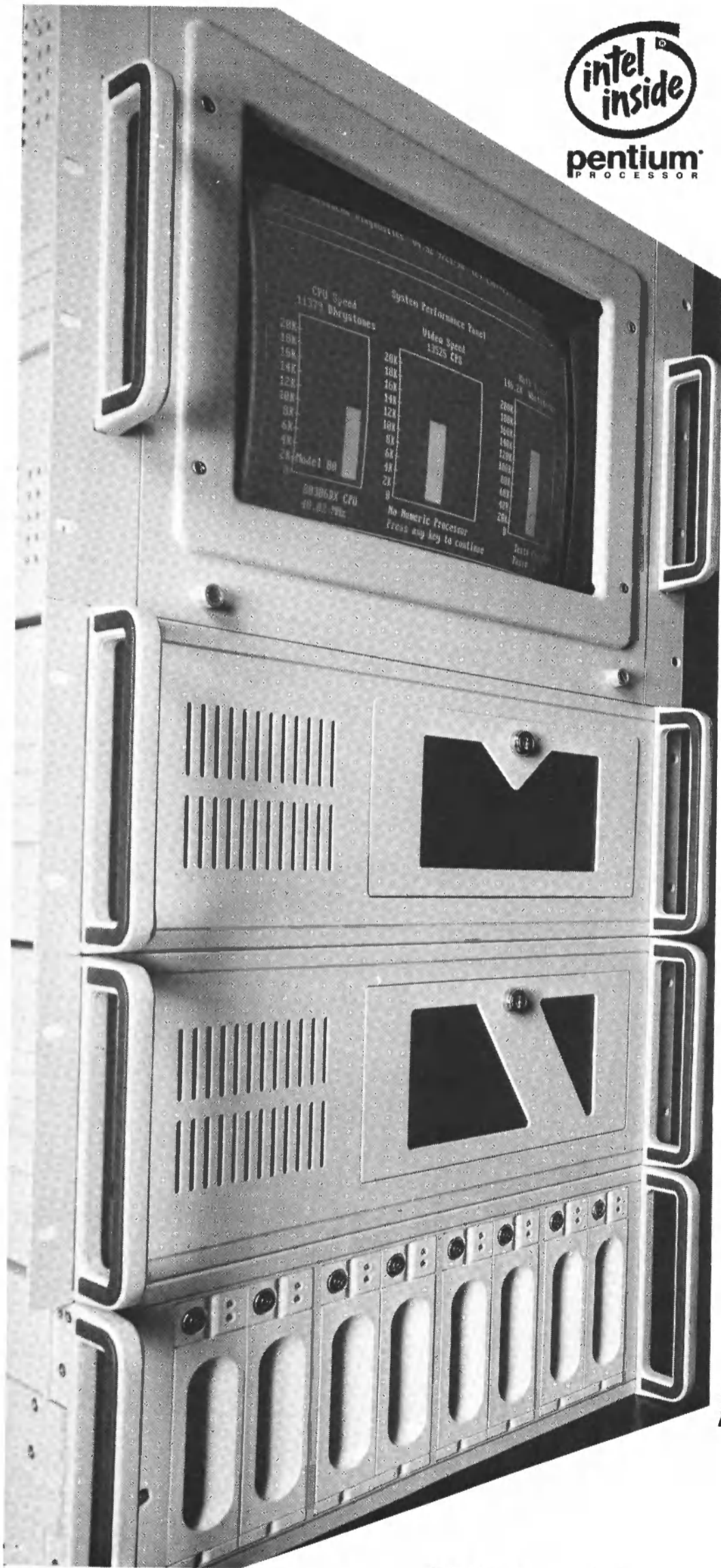
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- * Multimedia & TV production



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Eletson Tanker Takes Shape At NNS

High-tech systems and time-saving products are beneficial to today shipbuilders, but they are not substitutes for hard work and good attitudes. Newport News Shipbuilding (NNS) now has both working for it, to complete the first Double Eagle tanker for Eletson and to ensure its viability well into the next century.

The shipbuilder is now at the tail end of an overhaul of its production systems and processes, a plan hatched in 1991 when NNS saw U.S. Navy cutbacks as an opportunity to diversify its product and service offerings.

The results include a \$120-million investment in robotics, computer-integrated manufacturing, and expanded drydock and refueling capabilities, with the new systems designed to provide benefits on both the navy and commercial side.

The focus for improvement has been not only on new equipment and systems, but also on creating and maintaining a highly motivated workforce which helps create and execute newly streamlined processes.

The very embodiment of harnessing "people power" is **Mike Keenan**, the energetic 30-year Tenneco veteran who is the director of the yards' product tanker program.

Mr. Keenan, who started as a laborer/electri-

cian at the yard in 1966, is in the office before dawn and leaves after dusk. He is truly 'under the microscope,' as the international maritime industry eagerly watches him guide NNS' re-entry into the commercial shipbuilding market.

He knows the primary goal is to stick to **Collis Potter Huntington's** mantra of "We shall build good ships here," but at the same time he is keenly aware of the competitive forces driving today's commercial shipbuilding industry.

Time is money, and while the first Double Eagle will take 15 months to build, the plan is to reduce that build time to "seven months, three weeks" by the seventh or eighth ship, said Mr. Keenan.

"We now face a brutally competitive market," Mr. Keenan said. "There have been quantum leaps in processes and technology, and we are now facing very mature competi-

tors." Aside from driving the cycle time down, he said another key for success is utilizing a global supplier base.

The implementation of this strategy is readily seen in the first Eletson ship, *Despotico*, with its propellers from Japan (Nakashima) and rudders from the U.K. (Hamworthy).

Still A Navy Yard, Always A Navy Yard

While international attention has focused primarily on NNS' commercial business, it is clear that the shipyard is, and will always be, a military vessel construction facility. This was especially evident during a recent tour of the facilities, as three aircraft carriers were at the yard: *Dwight D. Eisenhower* (CVN-69); *John C. Stennis* (CVN-74); and *Harry S. Truman* (CVN-75), which is currently under construction.

The yard is also a member of one of the teams bidding to build the 12-ship LPD-17 class of vessels. In a collaborative effort with Ingalls, Lockheed Martin and NASSCO, the team has submitted a bid which **D. Scott Stabler II**, NNS' LPD-17 program manag-



Despotico's MAN B&W diesel engine is lowered into place at Newport News Shipbuilding.

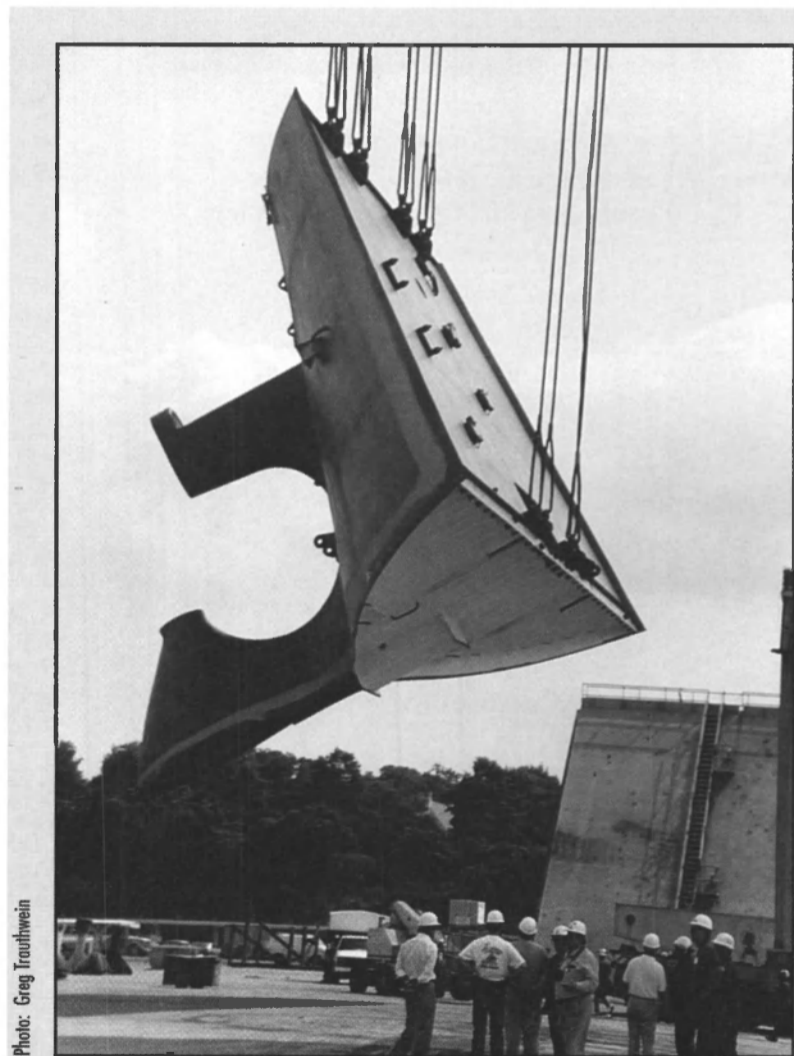


Photo: Greg Trouthwein

The stern section of the first double-hull tanker being built for Eletson. Not long after this photo was taken, the section had to be lowered and secured in preparation for hurricane Bertha. Note: Pictured fifth from left (with a camera around his neck) is Gregory Hadjieleftheriadis, one of Eletson's director/owners, escorting a group to check the status of the newbuilding.

er, hopes will end in a contract for the consortium when the contract is awarded in September.

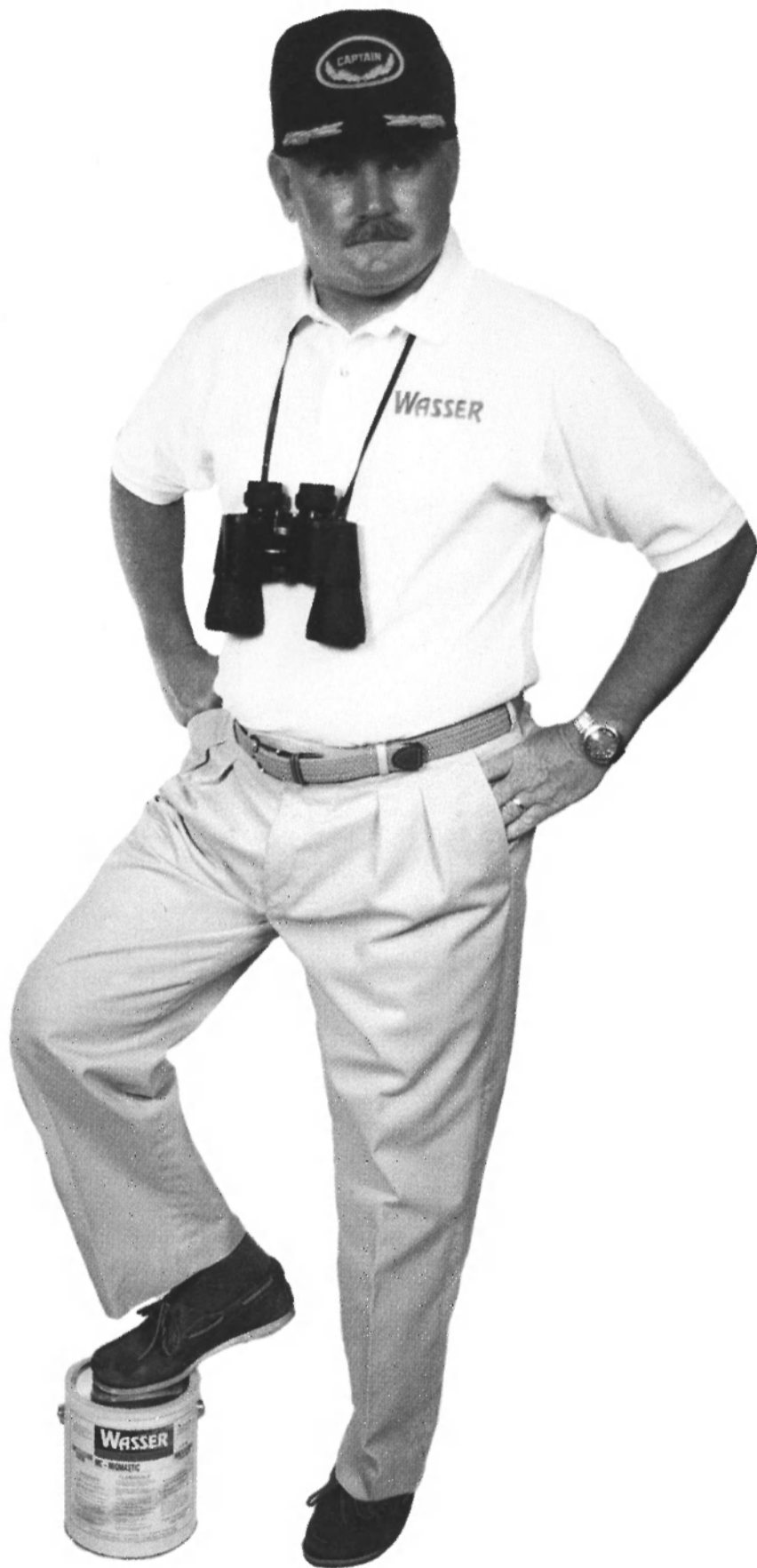
By many accounts, the LPD-17 program is radically different from any other Navy ship program, mainly due to the manner in which it was procured and will be evaluated. Major emphasis is being placed on life cycle costs; i.e. the projected cost to purchase, own and operate the ship. The level of team integration among traditionally competitive companies is also unprecedented. However, for the economic viability of the shipyards and the government, it may be the norm in the future. "Teaming will be an essential element in all future Navy procurement," Mr. Stabler said.

The same team that bid for the LPD-17 also recently won a \$1-million contract from the Defense Research Projects Agency (DRPA) and the U.S. Navy to provide initial design concepts for the arsenal ship program.

Along with the aircraft carriers and, potentially, LPD-17, NNS has several other strategies for military sales, including: FF21 Frigates for international sale; fast sealift ships; ship repair and overhaul; and aircraft carrier refuelings.

For more information on Newport News Shipbuilding Circle 97 on Reader Service Card

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ing in harsh environments.

Wasser's proprietary improvements of this technology have yielded a class of coatings that reportedly offer performance and application advantages compared with epoxy urethane and inorganic coatings.

Kopcke International (USA)

Circle 29 on Reader Service Card

Kopcke International (USA), Inc., part of the Kopcke Group, provides a "one stop supply service," also handling storage and transportation of owners' materials and ship spares.

Kopcke recently celebrated its third anniversary in Houston with a move and expansion of its operations, tripling the size of its warehouse and increasing staff the size

of its staff as well.

Stan-Blast Abrasives

Circle 30 on Reader Service Card

Stan-Blast is a manufacturer of coal slag abrasives on the U.S. Gulf Coast, with plants in New Orleans and Galveston. It is also an authorized Blastox blender, and

distributor for GMA garnet. The company also provides a spent abrasive recycling service.

Aqua-Dyne, Inc.

Circle 34 on Reader Service Card

Aqua-Dyne's GA 200 Series high pressure waterjet unit operates at pressures up to 20,000 psi and is available in a variety of configurations.

Solid ceramic plungers within a triplex positive displacement 3.5-inch stroke pump rated up to 200 hp provide flow rates of more than 17 gallons per minute at 20,000 psi, and 68 gallons per minute at 5,000 psi.

The GA 200 can handle a wide range of waterjetting tasks and is designed to provide the water-impact force of many higher pressure systems without their associated problems. Models are available with diesel, gasoline, or electric engines and come trailer or skid-mounted.

Cathelco Ltd.

Circle 35 on Reader Service Card

Cathelco Ltd. has installed its 2,000th anti-fouling system on Celebrity Cruises' *Century*, the cruise line's new flagship, built by Meyer Werft. The Cathelco equipment is designed to protect the ship's seawater pipework system against marine fouling and corrosion.

The installation consists of three separate anti-fouling systems and control panels, one in each of the three machinery compartments protecting the port and starboard strainers. The strainers with the largest flow rates, at 2,570-cu-m per hour and 1,120-cu-m per hour, were fitted with two pairs of copper and cast iron anodes, while the other strainers have single pairs.

Carboline Company

Circle 36 on Reader Service Card

Carboline Company has announced an agreement to purchase a majority interest in Chemrite Coatings (Proprietary) Ltd. of Johannesburg, South Africa. The acquisition was scheduled to close in July. Chemrite is a manufacturer of industrial maintenance and corrosion control coatings, serving South Africa and neighboring countries.

Carboline Company, an ISO 9000-certified division of RPM, Inc., is a manufacturer of protective coatings, tank linings and fireproofing.

The Tapecoat Company

Circle 39 on Reader Service Card

The Tapecoat Company announced the addition of RPH Distributors Ltd., Calgary, Alberta, to its international sales and sup-

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Circle 228 on Reader Service Card

COATINGS & CORROSION CONTROL

Royal Chemical Corp.

Circle 187 on Reader Service Card

Royal Chemical offers Easy Kote, a new multipurpose surface tolerant paint which is a water based modified asphaltic coating which dries to a semihard finish. The coating has gone through comprehensive testing by Marine Materials Technology Centre for Applied Materials Research in Norway.

Eureka Chemical Co.

Circle 190 on Reader Service Card

For maintenance of ballast tanks, the soft coating Fluid Film is billed as complete, affordable protection by Eureka Chemical

(Coatings & Corrosion Control Review continued on next page)

Company.

Emerald Creek Garnet Co.

Circle 189 on Reader Service Card

Emerald Creek Garnet is designed as a coast effective solution for tough blasting projects. It is manufactured to ensure low free silica with no toxic metals, low material consumption and reduced disposal, and extremely low dust levels.

Cygnus Instruments

Circle 188 on Reader Service Card

Cygnus provides the means to perform ultrasonic coatings thickness testing on decks, bulkheads, tanks and hull plates without grinding.

Ashland Chemical Acquires Assets Of Shipboard Chemical Supplier

Ashland Chemical Co., a division of Ashland Inc., has acquired the assets of Dearborn Marine Group's South American business, a shipboard chemical supplier of W.R. Grace & Co. The Dearborn Marine Group supplies chemical products to South American flag vessels and international vessels that travel between South American and the rest of the world.

The business will be integrated into Ashland's Drew Marine business, a manufacturer and marketer of chemicals and other shipboard supplies for the world's fleets. The sale encompasses assets, including inventory and equipment.

Aker Omega And Mustang Engineering Form Alliance

Following the partnering trend in the oil industry, Houston-based companies Aker Omega, Inc. and Mustang Engineering, Inc. have formed an alliance which will provide additional growth opportunities for both organizations, particularly in Gulf of Mexico deepwater projects.

Aker Omega will continue to expand its deepwater marine and subsea capabilities, in conjunction with sister companies Aker Marine, Aker Gulf Marine, Deep Oil Technology and Spars International. Mustang Engineering will continue to expand its detailed engineering capabilities, particularly for topside facilities. Some staff transfers will take place, in order to be consistent with these objectives.

New IACS Chairman Stresses Need For Safety Consensus

Bulk carrier safety and consensus efforts to deliver maritime safety improvements will reportedly head the agenda for the International Association of Classification Societies (IACS) during the next year. Incoming Chairman **Dong Jiufend**, of the China Classification Society (CCS), will lead the society's continuing focus on developments for a safer bulk carrier fleet. Among other key measures, IACS' May Council meeting agreed to accelerate work on new Unified Requirements for bulk carrier newbuildings contracted on or after July 1, 1998, and on fresh research into increasing the survivability of laden ships experiencing hold flooding. Further acceleration of intensified cargo hold surveys on older bulkers, more rigorous provisions in IACS' Enhanced Survey Program, and more industry cooperation to improve loading practices were other initiatives agreed upon at the May Council.

Falk Forms Australian Joint Venture

The Falk Corporation and Leussink Engineering of Unaderra, New South Wales, Australia, have formed a joint venture company to rebuild and repair enclosed gear drives and other mechanical power transmission machinery. The new company, Falk Renew Pty. Ltd., will serve the Australian, New Zealand and Indonesian markets, and is headed by 36-year Falk employee **Ron Schultz**.

The Falk Corp. is a leading manufacturer of industrial power transmission machinery, including standard and custom gear drives, flexible shaft couplings, backstops and fluid power drives and couplings.

August, 1996

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COATINGS & CORROSION CONTROL

port team.

RHP has assumed Canadian representation for the complete line of Tapecoat corrosion protection products.

RHP stocks a full complement of Tapecoat products, including the new Tapecoat Gray protective tapes, with the integrated primer and the environmentally-conscious TC Enviroshield marine corrosion control system.

Vecom

Circle 40 on Reader Service Card

Vecom is a Dutch company that specializes in chemical cleaning and surface treatment of metals and metal alloys.

The company sold its marine department last year, but since then has tried to penetrate the marine market by selling its chemical cleaning services.

Vecom provides metal surface treatment either on location or in its metal laundries. It offers pickling and passivation of carbon-stainless steel and non-ferrous materials, boiler maintenance, and the removal of contaminants with ultrasonic cleaning methods.

U.S. Paint Corporation

Circle 41 on Reader Service Card

U.S. Paint Corporation, a national and international marketer of paint and coatings for the marine, aviation, automotive and industrial markets, announced that its quality management system has been approved by Lloyd's Register for ISO 9001 certification.

U.S. Paint's Quality Management System certification is applicable to the design and manufacture of specialty coatings.

Eutectic Corporation

Circle 42 on Reader Service Card

The new line of cold repair Eutectic composites, made with advanced ceramics, carbides, polymers and other materials, is designed to provide wear resistance and to improve the performance of equipment.

The Eutectic composites are unlike solvent-based compounds in that they produce no volatile organic compounds (VOCs) or other toxic fumes, and have virtually no odor.

The line of Eutectic composites includes products such as Express, an emergency repair patch for a wide range of substrates; Ceramic Brush-On, a brushable coating for protection against corrosion, cavitation and chemicals; and General Repair, high performance bonding and rebuild compound.

Graco, Inc.

Circle 43 on Reader Service Card

Graco's new expanded line of high pressure corrosion control sprayers are designed to provide extra power for higher flow rates, longer lines and better automation. Pressure ratios have reportedly been increased by up to ten percent on Bulldog, King and Premier corrosion sprayers.

Wear life of these sprayers has been extended by building extra strength into the pump couplings, piston/displacement rods and ball stops, foot valves, housing, wet cup, threads and pump outlets. These new pumps also feature an extended three-year warranty.

Corroseal, Inc.

Circle 44 on Reader Service Card

Corroseal is designed to convert rust into a barrier of black, non-rusting magnetite, for priming metal for painting in just one application. This water-based converter is combined with an unpigmented, latex copolymer primer, is nonflammable and VOC compliant. Corroseal has been field tested for use on decks, double bottoms, ballast tanks and bilges.

Ipec L.L.C.

Circle 62 on Reader Service Card

Ipec L.L.C. is a holder of a patent for recyclable abrasive blasting technology. Rather than prohibiting manufacturers from producing equipment whose design violates Ipec's patent, the company is offering to license the technology on a per-unit basis. License fees to manufacturers will equal three to seven percent of the value of the machinery.

Ipec has also established a basis for owners of infringing machines to continue using those machines. Depending upon whether the manufacturer of the infringing equipment cooperates in the licensing program, owners' fees for existing equipment will range from one third to two thirds of the fees for new equipment.

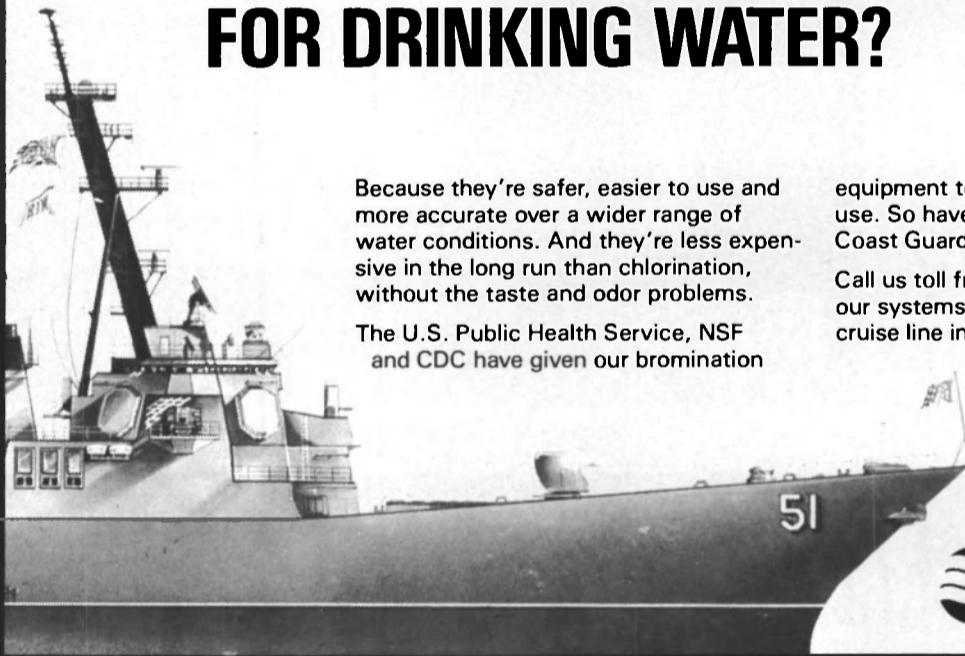
Infringing equipment can also be licensed on a project-by-project basis. William D. Gluck, president of Ipec, stated these fees will be based on the number of square feet treated.

Dampney Company, Inc.

Circle 63 on Reader Service Card

Dampney's Thurmalox 260 heat and corrosion resistant coatings are now VOC compliant. The coatings have a VOC content of 3.2 lbs./gal. They can be applied directly to ambient equipment in the field or in fabrication shops, or to hot operating equipment at temperatures of up to 500°F (260°C).

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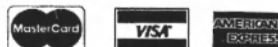


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PROFIT REPORT

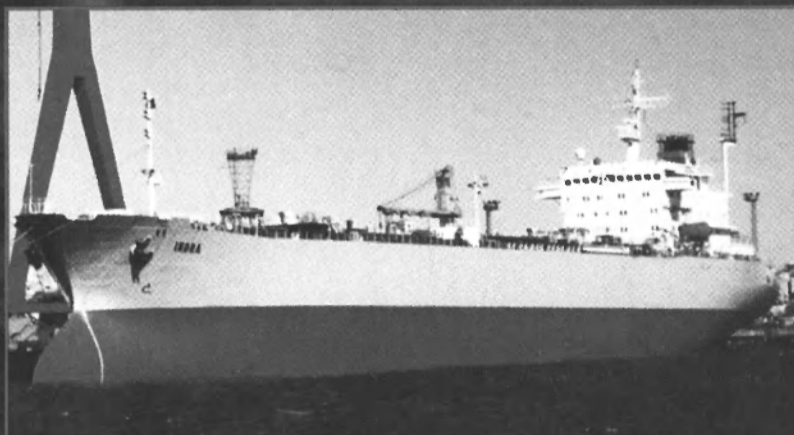
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COATINGS & CORROSION CONTROL

Thurmalox 260 series coatings continue to be available in standard formulations as well as VOC-compliant formulations. Thurmalox 260 coatings are designed to form a chemically resistant, color stable finish that protects metal from corrosion, weathering and thermal shock.

Nace International

Circle 75 on Reader Service Card

For more than 50 years, Nace International has provided engineers, manufacturers, and consumers with information, knowledge and networking in an attempt to stop corrosion in marine environments.

Topics such as coatings, surface preparation, inspection, and materials integrity are the subject of several technical symposia held at Nace's annual conferences. The group offers many reference books, such as its *Steel Structures Painting Manual*, and *Essentials of Surface Preparation*. Nace also provides training programs for coatings inspection and standards development, including high pressure waterjetting, surface preparations, and testing of coatings.

Ashland Chemical Co.

Circle 65 on Reader Service Card

Magnakote Plus rust preventive, from Ashland Chemical's Drew Marine Division, offers five-year protection against rust in ballast tanks and void spaces.

Magnakote Plus and Magnakote, the company's original rust preventive with a two-year-protection formula, interact with oxides to prevent further corrosion. They work electrochemically, bonding to steel and forming layers of flexible, overlapping platelets. This bonding action creates a chemical barrier that reportedly halts new corrosion while also acting as a descaler of existing rust. Both Magnakote Plus and Magnakote are applied at a thickness of 75 microns and are designed to cure to a transparent film that makes the underlying steel visible, facilitating inspection.

Jotun Valspar Marine Coatings

Circle 64 on Reader Service Card

Jotun has introduced a new epoxy mastic anti-corrosive coating and a water-based acrylic for cruise ships and ferries.

Polymastic 100 is a high solids, solvent-free coating designed to offer resistance to abrasion, and to fresh and salt water, solvents and other chemicals. Polymastic 100 can be applied by normal airless spray equipment, to give single-coat, dry-film thickness up to 500

microns. It can be used alone or overcoated with a variety of top-coats, and has an extended potlife of 50 minutes at 23° C.

Jotun also offers Val-Kryl, a high gloss, water-based acrylic paint for cruise ships and ferries. Val-Kryl can be applied over existing solvent based coatings and is VOC

compliant.

International Paint

Circle 76 on Reader Service Card

International Paint, a marine coatings manufacturer, has developed Intercare 123, a new paint system aimed at the marine coat-

ings finishes market. Intercare 123 is a hardwearing, single pack finish designed to reduce rust stains and facilitate cleaning.

The new coating is a semi-gloss, available in white and colors, and compatible with a range of primers. Intercare 123 can be applied over most existing finishes

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covers all generic types of shopprimers such as PVB, Epoxy, Zinc epoxy, and Zinc silicates.

The state of the art product HEMPEL'S SHOPPRIMER ZS 1589 is a zinc silicate with low zinc content. It is especially designed to support productivity requirements in shipyards and steel mills.

Several tests have confirmed that there is a negligible effect on flame cutting, plasma cutting, MIG/MAG welding and submerged arc welding. Initial tests show no effect on laser cutting.

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COATINGS & CORROSION CONTROL

by an airless spray, brush or roller.

Intercare 123 has incorporated XP40 into its new formula — an ingredient exclusive to International Paint. This ingredient is an active pigment which chemically combines with rust stain and converts it to colorless, water soluble salts. Since December 1993, Intercare 123 has been trialed on a total of 26 vessels, including cargoships, tankers, bulk carriers, as well as passenger cruise vessels.

Hempel Coatings (USA), Inc.

Circle 74 on Reader Service Card

Hempel is an independent manufacturer of marine coatings. Hempel currently operates 28 modern production plants and 250 main stock points located on five continents.

Hempel has focused its investments on environmentally-conscious coatings, such as tin-free, self-polishing antifouling, high solids and low-VOC coatings, including waterborne coatings. Recently the company has introduced a new range of Shopprimers, including Hempel's Shopprimer ZS 1589, a two-component, modi-

fied ethyl silicate shop primer formulated with a low level of zinc.

Total Rust and Corrosion Control, Inc.

Circle 77 on Reader Service Card

Total Rust and Corrosion Control has introduced its newest product, Temporary Masking Bonder (TMB), which can be sprayed onto plastic and paper masking materials, holding them to a variety of surfaces, such as bare and painted metal, wood, and glass. Because TMB does not adhere masking materials to these surfaces, it allows masking material to be pulled away cleanly, without bonding residues. The product reportedly eliminates waste created by rolls of tape and needed to scrape and solvent wipe tape from surfaces.

Sigma Coatings

Circle 78 on Reader Service Card

Sigma Coatings has been awarded a coating contract by Brasoil. Sigma Coatings' systems will be applied to the 282,750-dwt VLCC *Cairu*,

which will be converted to FPSO *Petrobras 32*, and the semi-submersible rig *Lliad*, which will become MPU *Petrobras 26*, a mobile floating production unit.

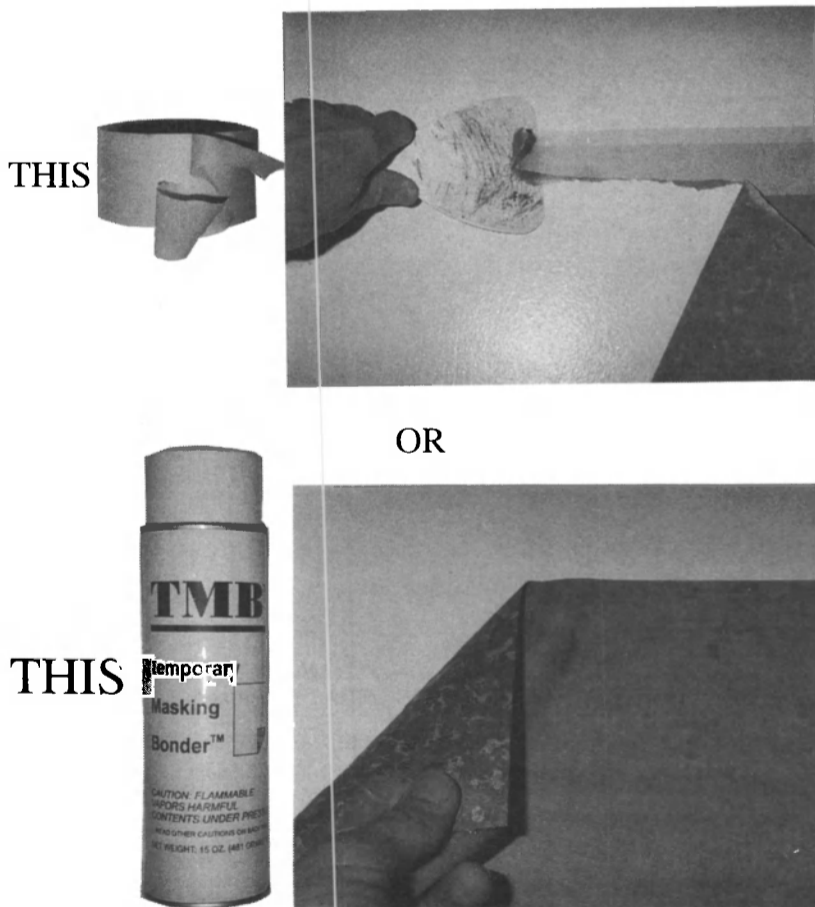
Sigma was chosen by Gdynia Shipyard for cold weather application. Two Burwain tankers were fully treated with Sigma products, including the ballast tanks, which were coated with Sigma tar-free system at the rate of approximately 120,000-sq.-m per vessel. Sigmaweld MC primer and Sigma CM system are also used extensively throughout the yard. Sigma CM's ability to cure down to temperatures of -10° C is a major factor in success in Polish shipyards.

PermaStopRust (America)

Circle 81 on Reader Service Card

Isotrol, a non-pigmented, rust preventer and moisture-repelling primer, along with Isoguard, a pigmented protective top coat/sealant, are designed to meld together and form one layer which resists separation, blistering and peeling. Together the Isotrol/Isoguard system resists chemical and ultraviolet degradation as well as vulnerability to abrasion and mechanical damage.

Total Rust and Corrosion Control, Inc.



- TMB™ is less expensive than industrial crepe masking tape!
- Will hold paper or plastic masking in place on almost any surface!
- No scraping required to remove brittle tape—TMB™ allows masking to be easily pulled from substrate even after prolonged outdoor exposure!

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Emerald Creek Making Our Environment Cleaner Garnet Company

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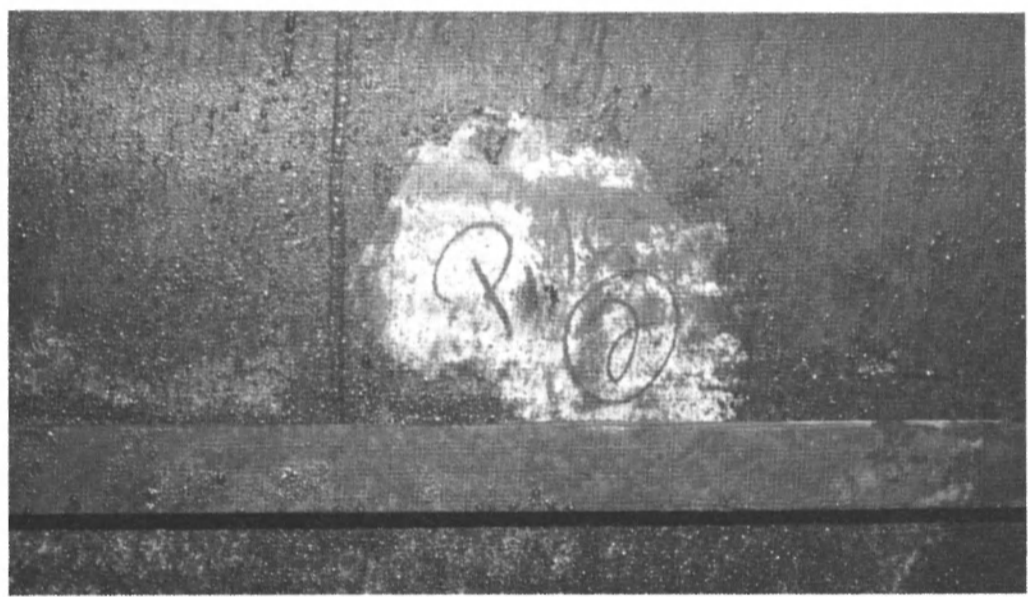
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Rohm And Haas Company

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Rohm and Haas Company, a specialty chemicals manufacturer, was one of four companies presented with the Presidential Green Chemistry Challenge Award at an awards ceremony in Washington,

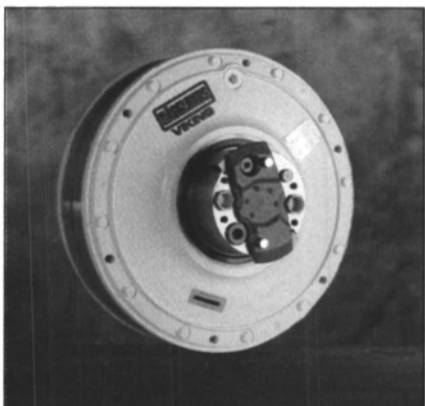
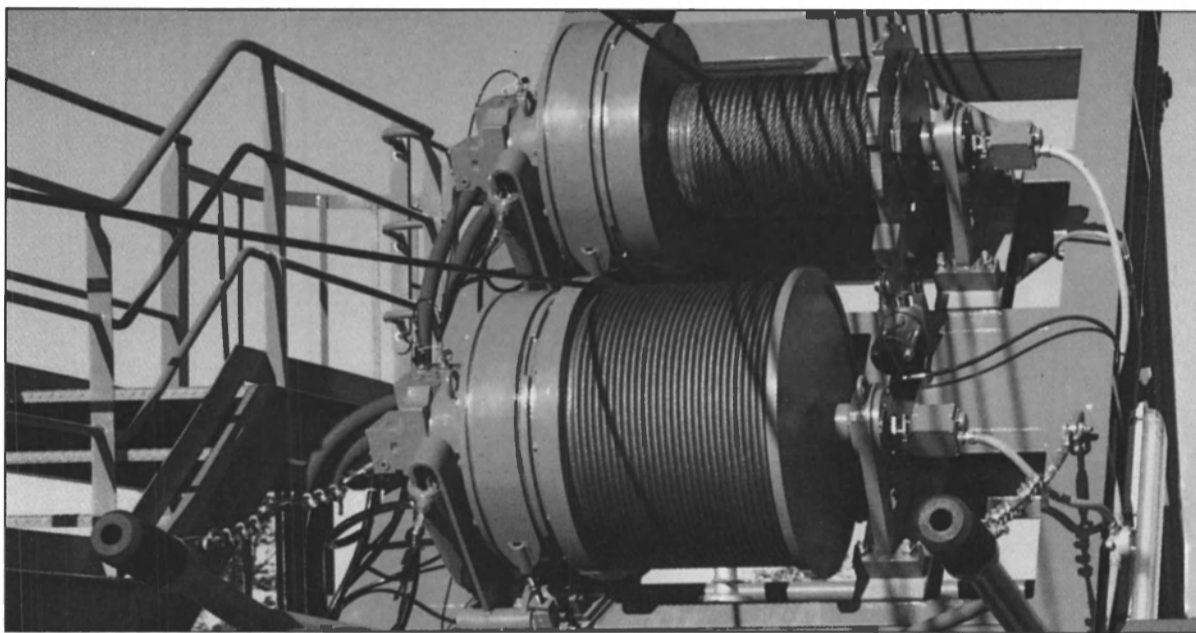
D.C. on July 11. Rohm and Haas was recognized for its development of Sea-Nine 211 marine antifoulant, which uses isothiazolone chemistry as a more environmentally acceptable ingredient in marine paints.

The Green Chemistry Challenge Award was established by an alliance of the chemical industry

and the Clinton Administration to recognize and promote fundamental breakthroughs in chemistry that accomplish pollution prevention through source reduction.

In March of this year, Rohm and Haas announced the opening of a new manufacturing facility in Bayport, Texas, dedicated to the production of the company's isothiazolone biocides and antifoulant products.

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Kansai Paint Co., Ltd.

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Nu-Forte Barrier, from Kansai Paint, is designed for the repair of heavily-corroded areas and pitting corrosion of ships. In combination with Nu-Forte or Nu Cep, Nu-Forte Barrier reportedly provides permanent protection of all types of vessels. Nu-Forte Barrier can be applied by brush or roller with no thinner required. Nu-Forte Barrier requires a minimum film thickness of 2,000 microns (2mm) and has a pot life that ranges from three hrs. at 5° C to 30 min. at 30° C.

Advanced Polymer Sciences

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Advanced Polymer Sciences is a manufacturer of MarineLine cargo tank linings for aggressive cargoes. MarineLine can carry 98% of all internationally traded chemicals today, including Methanol, Sulfuric Acid, MTBE, Phosphoric Acid, and Lube Oil additives at high heat, and offers 100% insurance coverage over five years. MarineLine is easy to clean, does not allow contamination from cargo to cargo and involves no waiting for coating to dry. APS also manufactures Uniline, a high strength and high purity lining for ISO containers, which is also covered by a 5-year, 100% guarantee.

Euronavy International

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Euronavy International, an ISO 9002 company that has produced quality paints for over 13 years, has introduced a new product, Euro-basic ES301. Euro-basic ES301 is a two pack composite epoxy coating that can be applied on wet and rusty surfaces in 100 percent humid conditions, with no dew point restrictions. This epoxy coating has epoxy composite, allowing it to reach steel surfaces by removing water molecules from the surface. Being moisture compatible, Euro-basic ES301 allows High water blasting surface preparation. Euro-basic ES301's formulation creates a strong chemical and mechanical bond between the coating and the substrate, allowing adhesion to wet and rusty surfaces possible. Euro-basic ES301 is a solvent free coating of 100% volume solids that complies with VOC regulations, so the absence of harmful solvents makes it easier and safer to apply.

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Clean-Up Outfit Spiffs Up Operations

In January, former British Petroleum executive **Steve Benz** assumed leadership of Marine Spill Response Corporation (MSRC), the oil spill response organization born of the Exxon Valdez accident in 1989. Since Mr. Benz has come onboard, the company has undergone an aggressive restructuring plan characterized by significant layoffs, the formation of a new affiliation of environmental service providers known as STARs (Spill Team Area Responders), and a reorganization of national resources from five regions of concentration into three. *Maritime Reporter* recently spoke with the company's newest recruit, former National Response Corp. executive vice president, and current MSRC Executive Vice President **Don Toenshoff**, about the changes taking place within the company. The following is a partial transcript of the discussions that took place.

MR/EN: With 115 people laid off recently, 40 percent of your workforce, how has MSRC's approach to providing dedicated spill responses been adapted?

DT: I'd like to cite a little bit of history. Prior to embarking on the past restructuring, **Steve Benz**, our president, outlined three major corporate goals. They are: total customer satisfaction; focus on external reputation; and commercial efficiency. By embracing and implementing a strategy which attains these goals, we have been able to effect this downsizing without any change in the scope of dedicated response capability.

MR/EN: Let's look at the team assigned to one of your response vessels, say *New Jersey Responder*. Has company downsizing affected the size of the boat's crew? Will the company's

restructuring affect the operation of the vessel in any other way?

DT: Absolutely not. We're still ready to go and deploy. Our planned performance is totally unchanged with the downsizing.

MR/EN: Is it fair to say that your company's cost-cutting strategies were implemented as part of a strategy to win old customers back?

DT: We're basically right now looking at retaining our present customer base and looking for new owners, specifically shipowners and oil companies. We're in the process of embracing programs that will be of interest to both of those customer groups.

MR/EN: How will the formation of STARs positively impact MSRC's spill response capabilities?

DT: Many of the STARs participants are regional response organizations with very strong infrastructure in their area of operations ... It really is the classic case of a pyramid strategy. You use the STARs structure to provide support ... They are the local experts.

MR/EN: When did the plan to launch STARs get underway?

DT: We've always had these contractors under contract. The program was initiated to bring them closer to the fold about eight weeks ago, in the beginning of May.

MR/EN: Is STARs at all similar to NRC's Clean Pacific Alliance?

DT: In terms of contractor network, it's the

same general concept of support. The other organizations have less dedication.

MR/EN: Is **Steve Benz** responsible for initiating these changes within MSRC, or were plans to restructure the company in the works while **Jack Costello** was at the helm in 1995?



Don Toenshoff

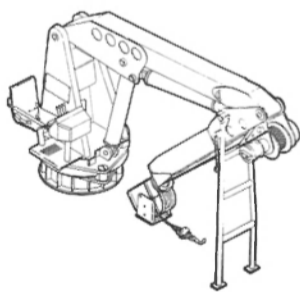
DT: Steve came onboard January 1 of this year. His mandate was to initiate the three goals that I identified previously. Part of the restructuring was to push responsibility and accountability for operational readiness down to a regional level, with headquarters providing a stewardship role. It is at the regional level, which we are now three regions versus previously five, that local or regional client issues can be addressed and responded to in an efficient manner.

Also more indicative of these changes, we've now done away with 'headquarters' and are now termed the Virginia Support Group. We will be moving (from D.C.) to northern Virginia suburbs as part of our cost-cutting structure in the near future.

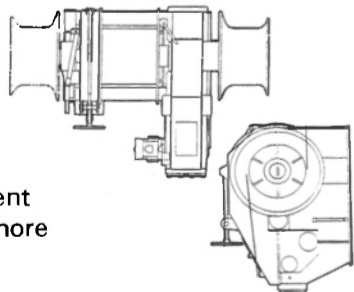
MR/EN: Ultimately, what factors compelled you to leave NRC and go to work for MSRC?

DT: I thought it was an opportunity to grow in a larger organization, in a broader geographic base. It was a challenge.

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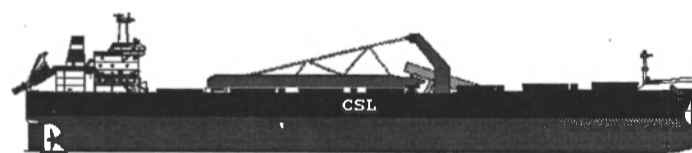
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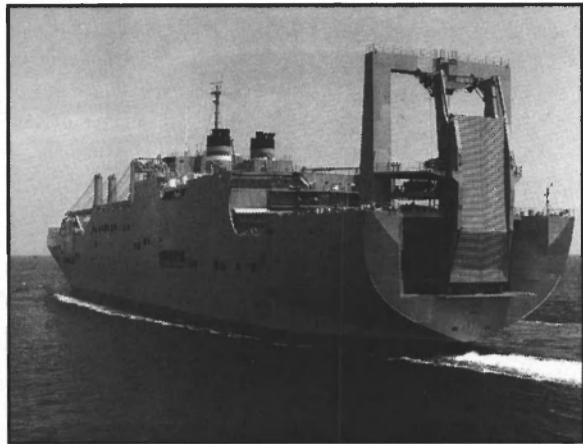
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Newport News Christens Sealift Ship On Independence Day



Newport News Shipbuilding (NNS), a division of Tenneco, christened sealift ship USNS *Gordon* on July 4 at the shipyard. In 1993, NNS was awarded the contract to convert two containerships into combined RoRo and LoLo ships to carry U.S. Army equipment, vehicles and supplies. The ceremony on July 4 marked the official naming of the first of these two converted ships.

Both strategic sealift ships being produced at NNS will be named after Medal of Honor recipients. USNS *Gordon* is named in honor of Master Sgt. **Gary Gordon**, a posthumous recipient of the Medal of Honor. Master Sgt. **Gordon** won the nation's highest military award for saving the life of a downed pilot of an Army helicopter in Mogadishu, Somalia, in 1993.

Carmen Gordon, Master Sgt. **Gordon's** widow, broke the ceremonial bottle of champagne over the ship during the naming ceremony. The principal speaker for the event was Congressman **John P. Murtha** (D-Pa.). The event also included a parachute jump by the U.S. Special Operations Command Parachute Team, a fireworks display, a pass-in-review by World War II and modern-day Army vehicles, and public tours of USNS *Gordon*.

For more information on Newport News
Circle 84 on Reader Service Card

Oceaneering Awarded Three Long-Term ROV Contracts

Oceaneering International, Inc. has been awarded three long-term remotely operated vehicle (ROV) contracts by Chevron USA to provide drilling and production support services in the Gulf of Mexico. Three new Hydra Magnum ROVs will be furnished to Chevron for use onboard semisubmersibles *Ocean Quest* and *Ocean Neptune* and FPS system *Genesis SPAR*.

This month, the vehicle is scheduled to begin a three-year contract to support Chevron's exploration drilling program onboard *Ocean Quest*. The second vehicle will be mobilized to *Ocean Neptune* in September, to support a nine-month program to pre-drill the wells at the Green Canyon 205 *Genesis* location prior to installation of the SPAR. The third vehicle will be mobilized to the SPAR in the fall of 1997, under a three-year contract to assist in the drilling and production of the *Genesis* prospect.

The Magnum vehicles are high-thrust, cage-deployed ROVs designed and manufactured by Oceaneering, and are reportedly capable of operating in water depths of up to 10,000 ft. (3,048 m). They are piloted by means of a microprocessor-based control system through a fiber-optic armored umbilical deployed from a surface vessel. Reportedly, these vehicles feature the latest advances in technology for improved performance, optimum adaptability and increased reliability.

For more information on Oceaneering International, Inc.
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Storage & Power "To Go"

Mobile and cost effective, both FPSO's and floating powerplants are catching on — respectively — with companies eager to capitalize quickly on promising oil discoveries and developing countries hungry for power

Time and money drive business decisions, and it is these two factors primarily responsible for driving a boom in FPSO and power barge contracts.

Time was the prime consideration in Mobil Oil's decision to produce a half million-acre concession offshore Equatorial Guinea in West Africa from a floating production, storage and offloading system (FPSO).

A successful discovery well and two subsequent appraisal wells established the Zafiro field as commercial. Mobil's Equatorial Guinea, Inc. (MEGI) unit initiated a fast-track development program "to get on stream fast and find out what we've got," according to **Art Green**,

MEGI vice president.

Enter Oceaneering Production Systems, a Houston company renowned for its conversions of ships and drilling rigs. After scouring the market, Oceaneering selected 22-year old oil tanker *M.T. Swift* (incidentally owned by Mobil) for conversion to FPSO *Zafiro Producer*.

In brief, a FPSO receives raw wellstream fluids from production wells, separates the crude oil from the natural gas and water present in the wellstream, and stores the crude onboard for offloading to shuttle tankers. The natural gas is used for fuel aboard the FPSO, and excess gas is flared. The water is cleansed of residual hydrocarbons before being discharged into the sea.

"FPSO technology is about 20 years old," said Oceaneering's Marketing Manager, **Chuck McCabe**. "Exxon used an FPSO at its Hondo Field off the coast of California in the 70s and 80s. It was later decommissioned and sold when the company installed a pipeline in the interest of environmental protection. FPSOs got a shot in the arm a few years ago when a Norwegian-built tanker proved the viability of a monohull production and storage facility in the harsh environment of the North Sea. They are gaining in popularity there, as well as throughout the world with about 30 FPSOs currently in operation. We estimate as many as 45 will be at work

(Continued on page 74)

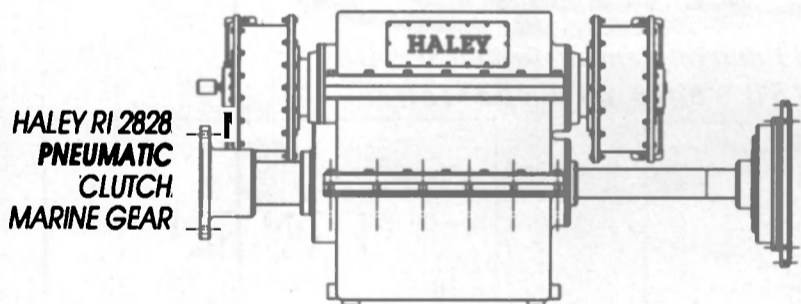
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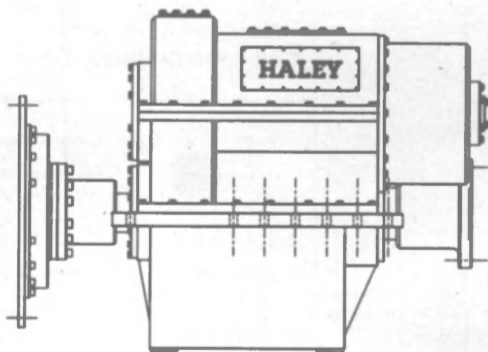
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Storage & Power "To Go"

(Continued from page 72)
within a few years."

As of yet, the concept hasn't had much impact in the Gulf of Mexico on the production side. One reason

is that the Gulf already has such an infrastructure of platforms and pipelines in place that there is less need for offshore processing and storage facilities, according to Mr. McCabe. Another reason is that

Gulf wells tend to require more frequent workovers, which aren't feasible from tanker-based facilities.

"To date, *Zafiro Producer*, at 268,000 dwt, is by far the largest of the three FPSO conversions to be

performed on the Gulf Coast," said Mr. McCabe. "The *Ocean Producer*, which we did, is 78,000 dwt and the *Jamestown*, converted by McDermott, is also a relatively small unit."

Mobil's timeframe for the field — it wanted production by the third quarter of this year — could not have been met by building a fixed platform, according to Larry Salz, MEGI's production manager.

"At a guess, installing a fixed platform at this location in 600 ft. (182.9 m) of water would have required about three years," said Mr. Salz. The conversion and mobilization schedule for the *Zafiro Producer* is 18 months.

"Even with such a platform, we would still have needed additional onshore or floating storage capacity. It was never really an option," he added.

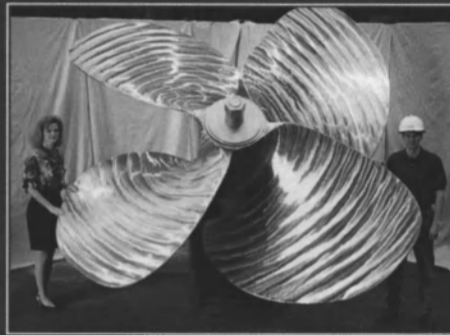
The added bonus afforded by the FPSO is its mobility, making it possible to move to another site if, or when, field production declines. The best case scenario for *Zafiro Field*, according to Mr. Salz, is for five to ten years of production, considerably less than the life expectancy of the FPSO.

Then there is the money. Mr. Salz estimated that a fixed platform at that location might have cost \$250 to \$300 million, compared with \$70 million for the conversion and outfitting of the FPSO.

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Electric Generating Plants

Money in a different context — the lack of it — has given rise to another maritime hybrid, the barge-mounted electric generating plant.

There is a growing market for electric power in most Third World countries. But, investors are reluctant to risk money on brick-and-mortar projects, such as powerplants, in developing countries. They tend to take comfort, however, in having their investment on a barge, which can be moved to another location in the event of default or other adverse circumstance.

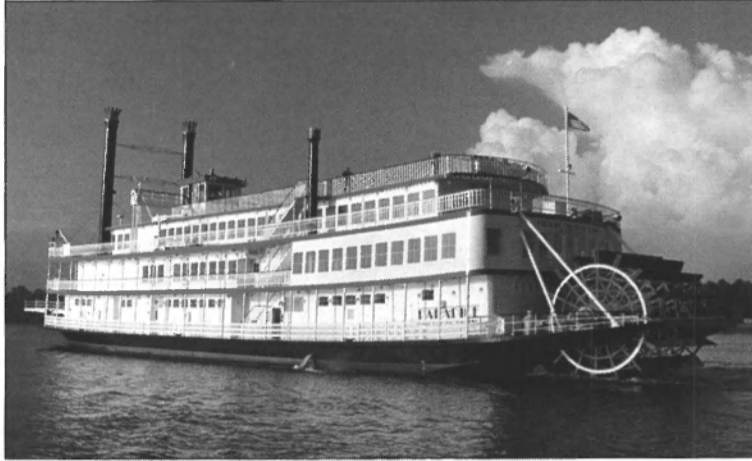
"The energy demand of developing countries such as India, Pakistan and much of Latin America is astronomical," said Nauman Ahmad, manager of Finance for Smith Cogeneration of Oklahoma City.

In 1994, Smith put in place one of the world's first, and at that time largest barge-mounted, combined-cycle (gas and steam fueled) generating plants in the Dominican Republic. It currently produces 185 MW of electricity.

"Access to financing is one of several factors which make barge-mounted powerplants attractive,



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but there are others," said Mr. **Ahmad**. "We can make use of state-of-the-art technology, high-quality facilities and skilled workers in the U.S. to build the plant rather than having to depend on

available resources on site. And, we can provide power in six to eight months. In the Third World, the need is yesterday."

Gregory Snyder, manager of Platform-Mounted Power Plants

for Westinghouse, said the technology of generating power by a combination of oil or gas-fueled combustion turbines and steam turbines powered by the heat they produce gave a substantial boost to

the business.

"We have contracts for barge-mounted powerplants totaling about 1,000 MW," said Mr. **Snyder**. "That isn't a lot by U.S. standards, but could equal the entire power generating capacity of some small countries."

Smith's Dominican Republic plant added nearly 25 percent to the country's actual generating capacity.

More important, it eliminated almost daily power shortages caused by failure of older equipment, according to **Donald Smith**, president of the Oklahoma firm.

Barges to support power generating plants are usually custom-built, according to Westinghouse's Mr. **Snyder**. He explained further: "The allowable deflection at the interface of a combustion turbine and its foundation is measured in millimeters, whereas the typical deflection in the deck of a barge would be measured in inches," he said. "It is necessary to isolate the turbine from barge deflection, calling for beefed-up construction to create a suitable foundation."

Another player in the power barge industry is a joint venture between Delta Hudson Engineering Corp., a subsidiary of McDermott International, and Stewart and Stevenson, Inc. of Houston.

Ron Greenlay, president of Delta Hudson, said that the joint venture's plan calls for production of "a standardized, simple-cycle (gas or oil-fueled only) plant with a nominal capacity of 80 MW." Two such plants are under construction with negotiations in progress for their sale, he added.

The new plants will employ two LM 6000 gas-fueled turbines, which are essentially derived from jet aircraft engines, manufactured by General Electric. They will be mounted on barges measuring approximately 270 x 80 ft. (82.3 x 24.4 m).

The total cost of the plant will be approximately \$48 million, according to Mr. **Greenlay**.

"We could look at combined cycle cogeneration plants, but our primary focus is on the standardized plant," said Mr. **Greenlay**.

Like others in the power barge business, the joint venture will target Third World applications, and could build floating powerplants speculatively.

"This is a niche business which might also have domestic (U.S.) markets for services such as providing extra power during the revamping of a conventional powerplant or supplementing hydroelectric plants in periods of drought," said Mr. **Greenlay**.

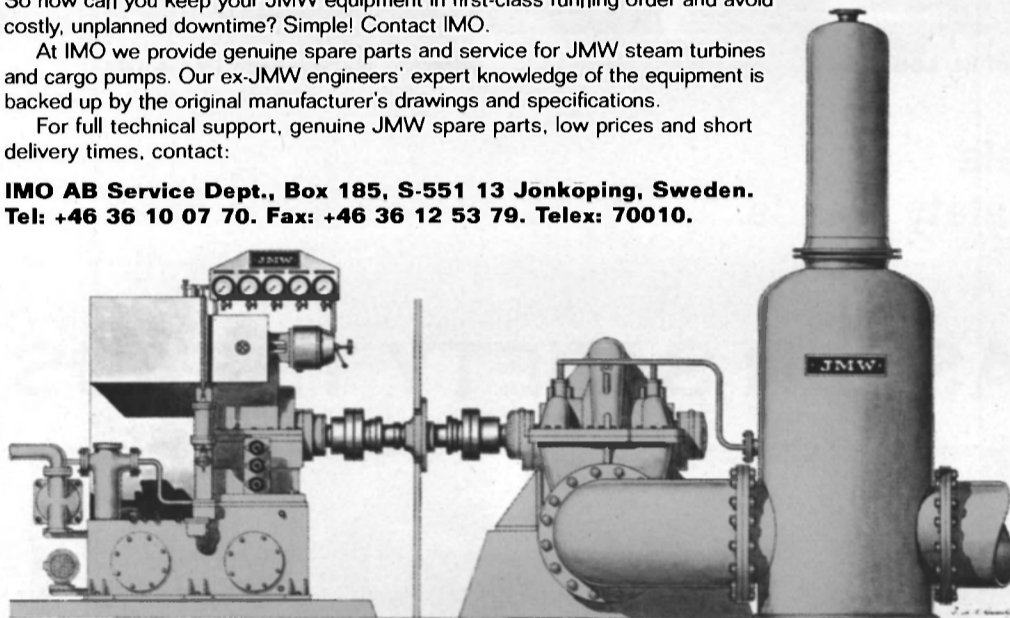
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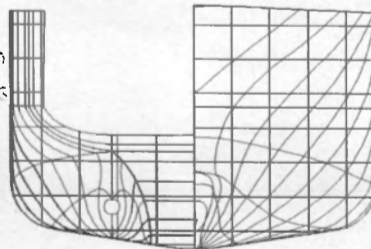
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MOORING AN FF50

Zafiro Producer began life as an 1,087 ft. (331.3 m) long tanker, 184 ft. (56 m) in the beam with a depth of 86.6 ft. (26 m). She has a storage capacity of 1,770,000 barrels of produced crude oil and 570,000 barrels of ballast water. Fully loaded, she draws 67.5 ft. (20.5 m). She was formerly classified as a Very Large Crude Carrier (VLCC).

Following conversion to an FPSO, she will be classed as an ABS A1 Floating Production and Storage System (FPSS).

To keep the 268,000-dwt *Zafiro Producer* on station in 600 ft. (182.9 m) of water, Oceaneering Production Systems designed a 12-point catenary chain and wire rope mooring system. The lines are attached to the vessel's hull by newly installed chain stoppers, three each at bow and stern on the port and starboard sides. Additional reinforcement was added at these points to transmit the line loads directly to the hull.

A portable hydraulic linear tensioner is required because the ship's mooring winches are not rated for the 1,660,000+ pound, 100-year storm design loads of the chain stoppers.

The mooring lines range in length from 4,010 to 4,150 ft. to accommodate the slope of the seabed, which ranges from depths of 450 to 1,000 ft. Each line consists of an upper section of 3 7/8 in. QRQ-grade chain, a middle section of 3 7/8 in. wire rope and a lower section of 4 in. QRQ-grade chain attached to a 65.6 or 78.7 (20 or 24 m) high holding power anchor.

The environmental forces in the *Zafiro's* vicinity arrive at the location with a high degree of consistency. They are dominated by a persistent swell from the southwest and a coastal current flowing toward the northwest. To minimize roll and heave, the ship is moored with its stern to the swell and the current on the starboard beam.

In this orientation, *Zafiro Producer* can accommodate bow-to-bow mooring of shuttle tankers in tandem, down-current from the FPSO, so that the tankers would be carried away from the FPSO in the event of an emergency disconnection during offloading.

Connected to the FPSO by a single hawser line, the tanker(s) will orient with bow into the current, minimizing the load on the FPSO mooring system.

The anchors and mooring lines will be installed prior to the arrival of the FPSO with the upper ends of the lines buoyed with pendant lines. The pretensioned lines will be passed by a support vessel to the FPSO where they will be secured in the chain stoppers and further tensioned by the portable line tensioner.

GE Contract With IHI To Supply Gas Turbines For Malaysian Barge-Mounted Power Project

GE Marine & Industrial Engines (M&I) has contracted with IHI to provide two GE LM2500 aeroderivative gas turbines for a

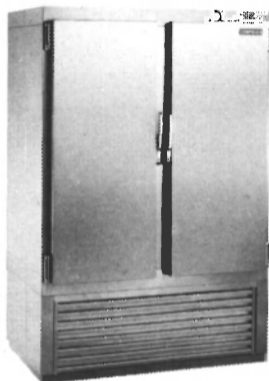
barge-mounted power project in Malaysia. The project is slated for commercial operation in 1997.

The two LM2500 gas turbine-generator sets will be built and provided by IHI for use by the Sabah Electricity Board (SEB). The gas turbines will run on distillate fuel in simple-cycle mode, with natural gas as a back-up. The 40 megawatts of electricity generated by



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the power barge will be fed to SEB's grid. The barge will be docked in the east Malaysian state of Sabah, and will be built by Sabah Shipyard Sdn. Bhd.

For more information on
GE Marine & Industrial Engines
 Circle 90 on Reader Service Card

Lykes Lines Joins Mediterranean/U.S.Gulf/ Mexican Alliance

Contship Containerlines Ltd. and Transportation Maritima Mexicana (TMM) have announced changes in their existing vessel sharing agreement that will reportedly increase dependability, frequency and geographical scope of service between the U.S., Mexico and ports in the Mediterranean.

Scheduled to begin in July, Lykes Lines Steamship will join the existing slot charter partners, Tecomar and Italia de Navigazione. Phase One of the service development will involve Contship and TMM operating three 2,100-TEU vessels servicing the ports Valencia, Barcelona, La Spezia, Miami, Altamira, Houston, New Orleans and Mobile on a fortnightly basis.

Phase Two of the development, planned for commencement in September, will include the addition of a fourth 2,100-TEU vessel, increasing the frequency to every 11 days and allowing for additional geographic coverage.

Operators are understood to be currently evaluating port calls in Gioia Tauro, which would become a hub port to the eastern Mediterranean, together with a U.S. Atlantic coast port call.

The five major carriers jointly announced that the strategic alliance will enable them to aggressively strengthen the level of service provided to a broad base of customers trading in the regions.

The carriers are also in discussion with other potential partners including Evergreen, which would join the consortia during Phase Two of the service development.

Stewart & Stevenson And Delta Hudson To Build/Sell Pre-Engineered Power Barges

Stewart & Stevenson Services, Inc. has entered into an agreement with Delta Hudson Engineering Corporation, a unit of McDermott International, Inc., to build and sell pre-engineered power barges using Stewart & Stevenson's LM6000 gas turbine technology. The floating powerplants will be built by McDermott Shipyard at Morgan City, La. Delivery is scheduled for the end of this year.

For more information on Stewart &
 Stevenson Services, Inc.
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Oil Majors Rally To Support Offshore Energy Center

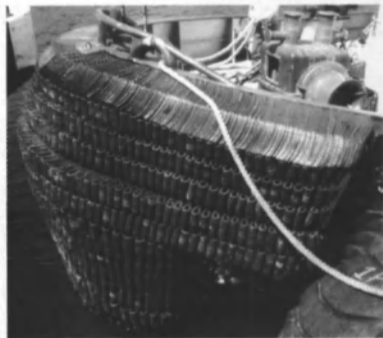
J.E. Golden, president of BP Exploration Inc. (left), presents the company's contribution to the Offshore Energy Center (OEC) to Les Mallory, vice president of the OEC board of directors.



Offshore Energy Center (OEC) capital campaign leaders announced that more than \$333,000 has been pledged by four major operators. The OEC is being developed on jackup rig *Ocean Star* at Galveston's Pier 19, and is reportedly the only center of its kind dedicated to all offshore segments with international and domestic operations.

The four donor companies are: Amoco Exploration and Production Company; BP Exploration Inc.; Exxon; and Texaco Foundation.

Many domestic and worldwide oilfield companies and organizations are discussing contributions during the capital campaign, according to Jerry M. Brown, OEC director and one of the campaign committee chairmen. The OEC is in the process of a \$3.2 million capital campaign for funds to transform the retired offshore jackup drilling rig into a museum-like setting for use by all segments of international offshore business. When completed, all exploration and production operations will be explained through equipment exhibits, models and interactive displays. Meeting rooms and full guided-tour capabilities have also been included, enabling the center to serve tourism as well as industry functions.



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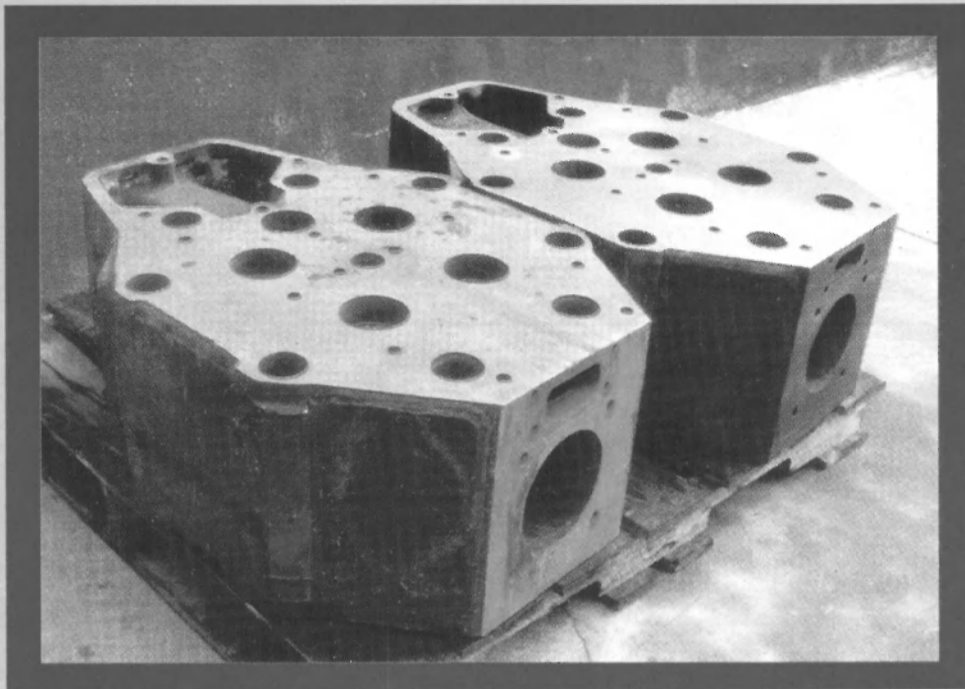
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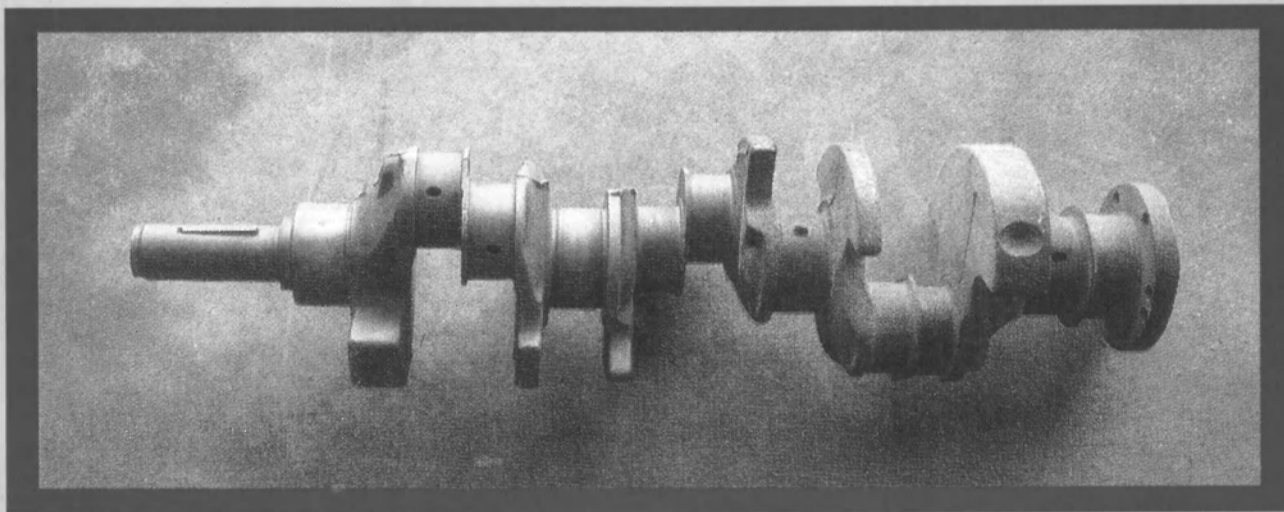
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PEOPLE & COMPANY NEWS

ASNE Appoints New Executive Director

As of April 1, Capt. **Dennis K. Kruse**, USN (Ret.) became the new executive director of the American Society of Naval

Engineers (ASNE). Previous to his latest appointment, Capt. **Kruse** completed a 30-year career in the U.S. Navy, most recently serving as executive director of the Policy, Operations and Acquisition Support Directorate, Space and Naval Warfare Systems Command.

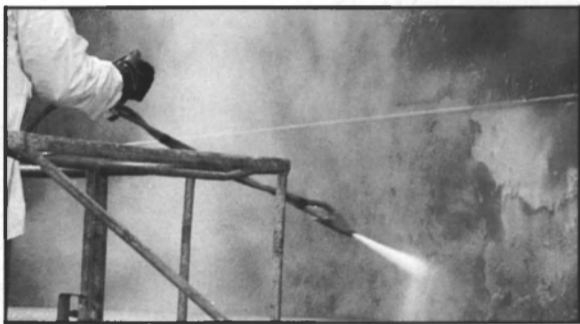
In the past, he has served as the commanding officer of the Naval Sea Support Center Atlantic in Portsmouth, Va., and as commander of the Naval Ship Systems Engineering Station (NAVSSSES) in Philadelphia, Pa.

Under the Navy's Laboratory

Consolidation Plan, Capt. **Kruse** reportedly led the merger between NAVSSSES and David Taylor Research Institute to form the Carderock Division of the Naval Surface Warfare Center, of which he was the first commanding officer.

A member of ASNE since 1979, Capt. **Kruse** has served as vice chairman and chairman of the association's Delaware Valley section. He has served three terms on ASNE's Council and has also served on its Sections Committee.

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CLIA Elects Executive Committee Members

On June 18, the Cruise Lines International Association (CLIA) member lines elected four officials to Executive Committee positions.

Stein Kruse of Radisson Seven Seas Cruises, a committee member since 1994, was named CLIA vice chairman, with former vice chairman **Rick James** of Princess Cruises, ascending to the chair-ship.

Joe Watters of Crystal Cruises and Celebrity Cruises President **Richard Sacco** joined the committee as members-at-large. Carnival Cruise Lines' (CCL) Senior Vice President of Sales and Marketing **Vicki Freed** was named the new chairwoman of the Marketing Committee, and was named CCL's representative on the Executive Committee.

Rounding out the Executive Committee are **Gary Sain** of Premier Cruise Lines, whose term continues until July 1997, and **Jim Godzman**, president of CLIA.

The election was held at the recent CLIA Managing Committee meeting held in Vancouver.

Schiller Service Corp. Hires New Engineers

Rudi Durez and **Thomas Pelowski** have joined the team of ship and mobile crane service engineers at Schiller Service Corporation, located in Hampton, Va. Mr. **Durez**, formerly employed by Munck Autech as an engineering technician, and Mr. **Pelowski**, previously an engineer in an Arizona powerplant, are now responsible for troubleshooting and repairing electronic, hydraulic and mechanical systems.

Schiller Service was formed in 1990 to provide service, spare parts and technical support for Liebherr's line of ship and mobile cranes.

In addition to its Hampton headquarters, the company maintains offices in Houston, Texas, and Long Beach, Calif.

PEOPLE & COMPANY NEWS

Bowles Assumes Leadership Of Nace Int'l.

Joe Bowles, Jr. recently accepted the presidency of Nace International, a society dedicated exclusively to the prevention and control of materials corrosion. Mr. Bowles has been with Tenneco Energy in Houston since 1957 and has held his current position, manager, Corrosion Control, since June 1986.

The presidential gavel was passed to him by Brian Holtsbaum, Associated Corrosion Engineers, Calgary, Alberta, during the society's annual conference on March 27 in Denver.

Mr. Bowles has been an active Nace member since joining in 1960, has been involved in many committees, and has chaired its membership committee and Corrosion Control of Offshore Pipelines (T-10-2) committee. The association, which provides training programs, standards development and information dissemination in the corrosion field, has more than 15,000 members worldwide.

Simrad Announces Merger With Kongsberg Gruppen

Simrad AS, the corporate body for worldwide Simrad operations, announced that the Kongsberg Group has acquired a majority of Simrad shares. Kongsberg is a supplier of electronics for marine, aerospace, defense and industrial applications in Europe.

The combined organization reportedly comprises more than 3,000 employees worldwide, with offices in 11 countries. It is hoped that its improved technology base, along with greater financial resources, will serve to strengthen Simrad's future market position.

Victaulic Honored By ASTM Committee

Victaulic Company of America, a manufacturer of mechanical piping components, recently received the Robert Taylor Award sponsored by the American Society of Testing and Materials (ASTM) Committee F-25 on Ships and Marine

Technology. Commemorating the committee's first chairman, the award is presented to companies that have "demonstrated and maintained a strong commitment with positive results in developing, producing, and using ASTM F-25 standards." Victaulic has sponsored leaders and assigned technical experts to facilitate standards

development. Douglas Dole, the company's manager of R&D and chairman of the ASTM F-25 Ships and Marine Technology Piping Systems Subcommittee, and Richard Weston, manager of Project Engineering, were cited as individuals who have provided exceptional support and made great contributions.

KVH Purchases Facility For New Headquarters

KVH Industries, Inc., a provider of communications and navigation products for commercial, marine and military markets, announced the purchase of a 75,000-sq.-ft.

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Dole



Weston

PEOPLE & COMPANY NEWS

facility for its new headquarters, located at 50 Enterprise Center in Middletown, R.I. This new facility is adjacent to the company's current leased facility, and will house the Administration, Engineering and Manufacturing departments.

GEC Alsthom Awarded Contract

GEC Alsthom has won an order from Metrovias

of Argentina to upgrade the Buenos Aires metro signalling system. CMW Equipamentos, GEC Alsthom's Brazilian subsidiary, will supply onboard signaling systems for 79 trains and a complete signaling system for automatic train control and central traffic management. The upgrade encompasses 53 stations on four lines, covering a distance of 32 km. The new system is expected to improve train performance and ensure greater passenger safety.

Aker Appoints VP Contracts/Marketing



Bobbitt

Houston-based Aker Marine, Inc. (AMI) has named **Larry W. Bobbitt** as vice president of Contracts and Marketing. He has 15 years of prior experience in the contract drilling business, and before accepting his latest appointment, was employed in the same capacity by Diamond Offshore.

AMI is an installation contractor specializing in engineered solutions for the worldwide offshore industry, principally focused on deepwater mooring system design, hook-ups of FPS/FPSOs and MODUs, sub-sea installations, structural mating services and fuel/product terminals.

Tracor Signs Agreement To Sell Division To SIMCO

Austin, Texas-based, defense electronics manufacturer Tracor, Inc., and SIMCO Electronics, Santa Clara, Calif., announced that they have signed a definitive agreement providing for the purchase of a Tracor division by SIMCO for \$7.5 million. The division, which is involved in instrument repair and calibration, is known as the Instrument Services Division, and is part of AEL Industries, Inc., acquired by Tracor in February.

SIMCO CEO **Lee Kenna, Jr.** said that the acquisition has opened up new growth opportunities: "National geographic coverage and the technical capability of Tracor's personnel make SIMCO the largest supplier of non-warranty instrument calibration and repair in the United States, with the broadest range of technology."

SIMCO Electronics provides technical services to the U.S. government and high-technology manufacturers in the biotechnology, semiconductor, computer and aerospace industries.

TT Club Adds New Directors

At its recent board meeting in Taipei, the TT Club appointed three new directors, namely: **Robert Cooper**; **C. Eugene Cox**; and **Lua Cheng Eng**.

Mr. Cooper is chief executive of Ports of Auckland Ltd. and president of the International Association of Ports and Harbors (ITPH). He is also a former international vice president of the International Cargo Handling Co-ordination Association (ICHCA), and chairman of the New Zealand Container Terminal Operators Association.



Cooper

Mr. Cox is senior vice president with responsibility for Engineering and Operations for the Bermuda Electric Light Co. **Mr. Eng** has been CEO of Neptune Orient Lines Ltd., Singapore, since 1979, and the company's deputy chairman since 1990. He is also president of the Singapore National Shipping Association, chairman of Jurong Shipyard Ltd., a director of

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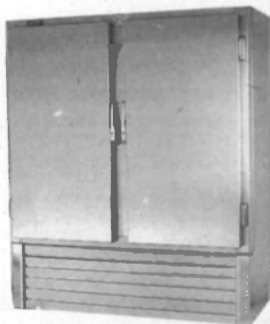
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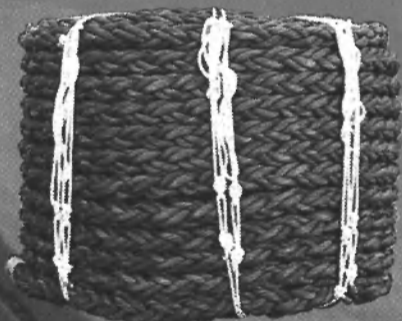
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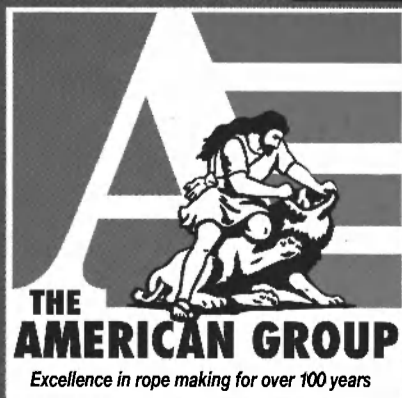
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9"	1,102 LBS.	110,000 LBS.	1,188 LBS.	183,000 LBS.	1,858 LBS.	220,000 LBS.	1,606 LBS.	219,000 LBS.
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PEOPLE & COMPANY NEWS

Sembawang Holdings Pte. Ltd., and reportedly maintains close links with various bodies such as NKK, BIMCO, and the Japanese classification society.

Keller Joins R.K. Johns

Peter I. Keller has joined the firm of R.K. Johns & Associates, and will be responsible for building client relationships and managing major consultancy projects. He was most recently

employed as chief executive of The Cast Group Ltd., where he was responsible for the substantial growth of the company's market share, and its return to profitability in the North Atlantic and Mediterranean container trades.

In the past, Mr. Keller has also served in several senior operating and general management positions with Sea-Land Service, and was a past member of the International Council of Containership Operators.

R.K. Johns & Associates is a New York-based marketing and management consulting firm serv-

ing the transportation industry, ship-builders and port authorities. **R. Kenneth Johns**, the former president of Sea-Land Service, is the firm's chairman.


Vikoma Names Non-Executive Director

A former head of the U.K.'s Marine Pollution Control Unit (MPCU) has been named a non-executive director of Vikoma International Ltd., an Isle of Wight-based manufacturer of oil pollution control systems.

British RADM. **Michael Stacey**, CB FIMgt FNI, the company's new appointee, established his career in the Royal Navy. Since retiring from his leadership position at HM Coastguard, he has chaired Atlantic Reconnaissance, been a non-executive director at Oil Spill Response Ltd., and has advised several countries on oil spill plans.



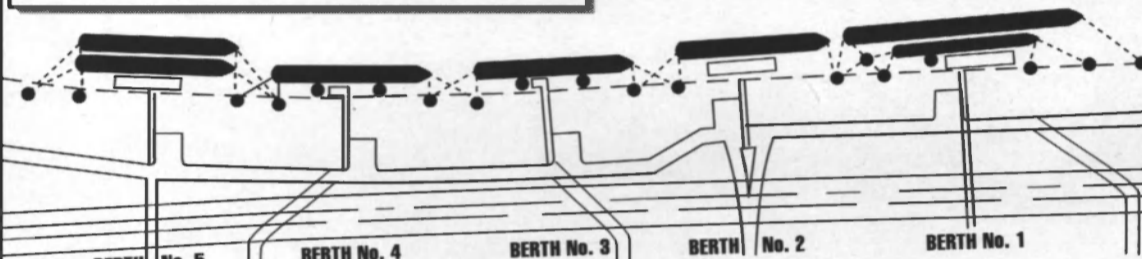
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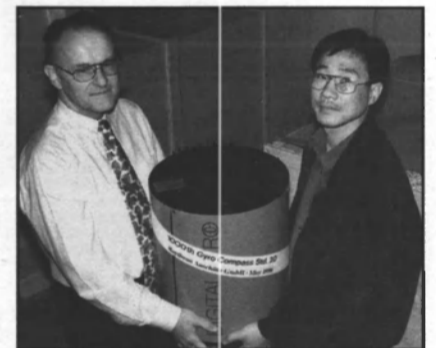
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Raytheon Supplies Record Number Of Gyro Compasses



Raytheon Sales Manager **H. Schulz** (left) hands over the company's 1,000th gyro compass to **H. Kim** of Dong Sung Co. for installation on a Samsung newbuilding.

Raytheon Anschutz recently supplied its 1,000th gyro compass Standard 20 to M/T **C. Bright**, under construction at Samsung Shipyard, Korea. The technical responsibility for installing and commissioning the navigational equipment was given to the company's Korean representatives, Dong Sung Co., in Pusan.

C. Bright is the biggest of a three-ship NB-series at Samsung Heavy Industries on Koje Island, and the vessel follows **Yukong Navigator** and **Yukong Planner**. The 1,082.6 x 190.2-ft. (330 x 58-m) ship will transport crude oil for Yukong Ltd., reportedly the largest crude oil refinery in Korea.

Wardle Storeys Acquires Division Of SMR Technologies

Wardle Storeys plc has acquired the assets of SMR Technologies Inc.'s Marine Products Division, and has formed a new company — Inflatable Survival Systems, Inc. — to run the business. The acquired business will operate from its factory in

PEOPLE & COMPANY NEWS

Ohio, and will be part of Wardle Storeys' Inflatable Systems Division which also includes RFD Ltd., a U.K.-based manufacturer of marine survival equipment.

David Abbott has been appointed president of Inflatable Survival Systems, Inc., and will ensure that the company continues to build on the position it has achieved in the liferaft market. The company will reportedly continue to support the Elliot and Crewsaver liferaft brands developed by SMR Technologies.

Davis Anchors Involved In Patent Infringement Litigation

For the past year, the Kent, Wash.-based anchor designer and manufacturer Davis Anchors has been in the midst of litigation regarding patent infringements claimed by manufacturer Simpson-Lawrence. The controversy erupted from the manufacture of Davis' Talon Plow anchor.

According to reports issued by Davis Anchors, the U.S. Patent Office recently accepted the company's request to re-examine the Simpson-Lawrence patent, and has issued an office action rejecting all 15 claims of the Simpson-Lawrence patent.

According to sources at Davis, the company maintained from the beginning that the Talon Plow anchor did not infringe upon the claimant's patent.

"We began Davis Anchors because of our belief that there was room in the boating marketplace for a line of well-designed and constructed anchors, at a competitive prices. We remain intensely committed to the industry and to the future of Davis Anchors," said company president **Sefton Oxford** in statement released to the press on June 13.

New Shipping Organization Formed

A new shipping organization has spun off from the American Institute of Merchant Shipping (AIMS), the organization which has represented American flag shipowners in Washington, D.C., since 1968. The new organization, the United States Chamber of Shipping (USCS), will encompass American-based operators of all types, irrespective of flag state, in order to comprehensively address the issues confronting American owners, operators and charterers of oceangoing vessels. USCS plans to become actively involved with

U.S. and international regulatory, legislative and administrative entities, as well as the public at large.

Donald B. Shea has been named president of the new organization.

He has an extensive background

in association management, and has served in leadership positions for the U.S. Brewery Association, the Council of Solid Waste Solutions and the American Plastics Council. In AIMS news, **Ernest J. Corrado**, former chief counsel to the House Merchant

Marine and Fisheries Committee, has stepped down from the presidency of the organization after ten years at the helm.

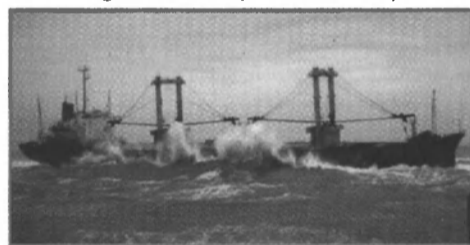
He has plans to remain actively involved in Washington as a consultant and advisor to the maritime industry.



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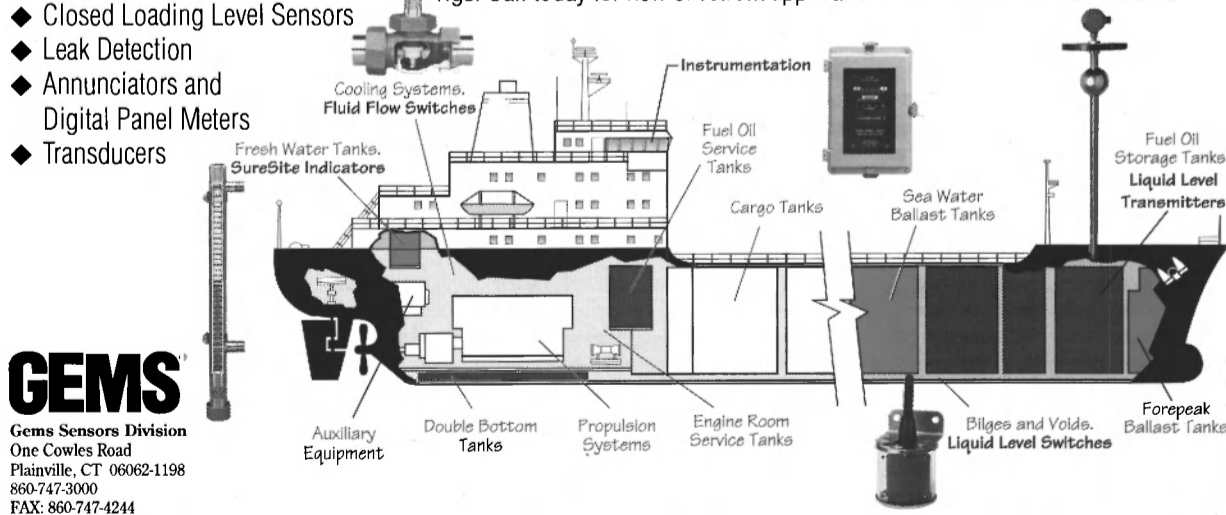
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PEOPLE & COMPANY NEWS

South Seas Names New Equipment Manager

Lou Jordan has joined South Seas Steamship Co. Ltd., San Francisco, Calif., as its Equipment and Logistics manager. His responsibilities include system wide equipment management; negotiation of depot contracts, equip-

ment master lease contracts and island transport rates; and management of the intermodal program.

Mr. **Jordan** was previously employed by Senator Lines (USA), and has also served as Equipment/Logistics manager for Johnson Scan Star and as Special Commodities manager for APL.

South Seas operates a shipping service between North America and the South Pacific

islands.

Doherty To Command USCG Nav Center In Alexandria

In a statement released to the press on June 19, the U.S. Coast Guard (USCG) announced that Capt. **James T. Doherty** would relieve

Halter Marine Christens And Launches Advanced Oceanographic Research Ship

Advanced ship named in honor of the late U.S. Commerce Secretary, Ronald H. Brown

Ronald H. Brown, a new oceanographic research ship named in honor of the late Commerce secretary, was christened by **Alma Brown**, widow of Secretary **Brown**, and launched by its builder, Halter Marine Inc., of the Trinity Marine Group.

When delivered in August 1997, the new ship will replace one of two aging ships in the National Oceanic and Atmospheric Administration (NOAA) fleet of the U.S. Department of Commerce.

Harvey Walpert, Trinity Marine Group senior vice president, Administration, and master of ceremonies at the christening, lauded the late Commerce secretary, as well as the recently deceased Chief of Naval Operations, Admiral **Mike Boorda**, for giving support to the construction of *Ronald H. Brown*. It is the fourth of a new class of vessels designed and built by Halter Marine. Overall, *Ronald H. Brown*, originally designated *Researcher*, is 274 ft. (83.5 m) long, with a 52.5-ft. (16-m) beam and a load-

line draft of 17 ft. (5.18 m). It has a displacement of approximately 3,300 long tons, and powered by a 6,000-hp diesel/electric propulsion system.

A unique feature of the Halter design is that all scientific laboratories are located on the main deck, with easy access to other labs and working decks. Lab spaces are designed to facilitate rapid realignment. All labs and decks are equipped with a system of built-in sockets on the floors, walls and overheads, reportedly permitting fast installation of other walls, carrels or equipment. Typical missions can include research on critical physical, chemical, biological, oceanographic and atmospheric processes. The vessel will be equipped with a dynamic positioning system which provides automated precision track-line and station-keeping capability. The system uses data from a global positioning system, a gyro-compass and a wind sensor to control the ship. It will have more than 3,500-



sq.-ft. of working deck space and more than 4,000-sq.-ft. of laboratory space.

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Maritime Reporter/Engineering News

PEOPLE & COMPANY NEWS

Capt. **Robert J. Wenzel** as commanding officer of the USCG Navigation Center in Alexandria, Va. The change of command ceremony reportedly took place on June 25.

Capt. **Wenzel** has retired from active duty after a distinguished career spanning 27 years. Capt. **Doherty's** last assignment was as chief of the Streamlining and Implementation Team from 1995-1996.

The USCG Navigation Center is responsible for operational control of the Omega, Loran C and Differential Global Positioning radionavigation systems. The Navigation Center also houses the Navigation Information Service, which provides status information on all U.S. radionavigation systems to the user community.

Ex-Libra Group CEO Opens Brazilian Entrepreneurship Office

Newton Figueiredo, former chief executive of the Libra Group, and current president of the Brazilian Society of Naval Architects, has started a company focused on recruiting investors for the Brazilian maritime sector. Ally-Brasil is the new company created specially to identify business opportunities in the maritime sector, with an eye for the best partners and financing sources, offering project management, publicity and public relations, market research, commercial support and technical advice. Specifically, the company will look for involvement in shipping, shipbuilding, ports services and multimodal and logistics services involving waterborne transportation. The company's office is situated in Rio de Janeiro.

New Director Joins Singmarine Board

Nelson Yeo, executive director of Keppel Shipyard, has been appointed director of Singmarine Industries Ltd., as of July 4. Before his appointment at Keppel, Mr. **Yeo** was president of Subic Shipyard and Engineering in the Philippines. Within the Keppel Group of companies, Mr. **Yeo** is chairman of Keppel Smit Towage Pte. Ltd. and Watt and Akkermans Pte. Ltd.

Leong Kang Chuen has resigned from the Singmarine Board.

Hitec Strengthens Management

According to company reports, in the past year, Hitec AS has carried out strategic takeovers, acquiring five technology companies in Norway and abroad. The company has also established four new sales and service offices, and has implemented a group management structure, hiring **Arne Smedal** and **Rune Kvernberg** as vice presidents.

Mr. **Smedal** is one of the founders of MCG, now wholly-owned by Hitec, and known as Hitec Marine. Mr. **Kvernberg** has considerable experience in the oil and

gas industry, and was most recently employed as technical manager of Total in Norway.

Parsons Names Worldwide Procurement Manager

H.D. Cooper has been named as manager of Worldwide Procurement for Parsons Process Group, Inc., a global business unit of The Parsons Corp., a full-service engineering, procurement and construction organization.

Based in Houston, Mr. **Cooper** will create a corporate wide global supplier database and will oversee worldwide procurement projects in the

petroleum and petrochemical industries. Prior to joining Parsons, he was employed by Catalytic Inc.

James Marine Services Appoints New Croatian Agent

James Marine Services Ltd. has named Atrax Export as its agent in Croatia. Atrax is a recently formed private company based in Rijeka whose activities include supplying marine equipment and spare parts to Croatian shipyards and shipowners. The company reportedly represents Jaybeam Ltd. U.K., U.S.-based Magnavox Electronic Systems Co. and GEC Marconi Marine.

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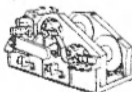
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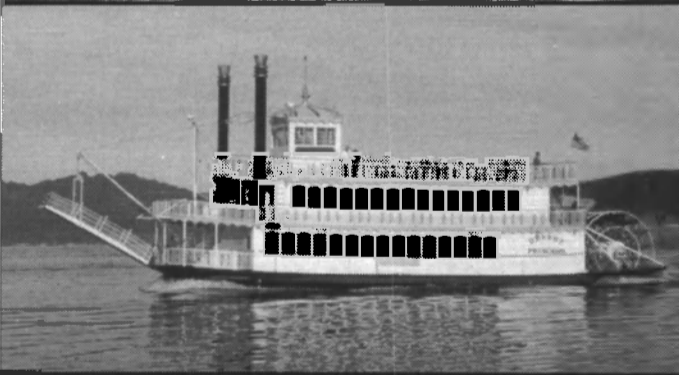
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(Bottom) Nostalgic SkipperLiner paddlewheelers from 49 to 800 passengers generate significant revenues for dinner cruise operators throughout the U.S.

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Recent Ship Sales

This report, compiled by Shipping Intelligence, Inc., a New York maritime consulting firm, tracks sale prices of secondhand bulk carriers and tankers. For more information, call (212) 997-0966.

Date Reported	Vessel Name	Vessel Type	DWT	Year Built	Price (M)
7/1/96	Gem	Bulker	11,848	74	\$1.7
7/9/96	Aboitz Mega Carrier 1	Bulker	12,246	75	\$1.4
7/15/96	Star World	Bulker	15,181	74	\$2.2
6/26/96	Union Confidence	Bulker	18,375	86	\$8.6
7/9/96	Velimahi	Bulker	18,863	77	\$3.5
6/17/96	Princess Castle	Bulker	20,800	84	\$8.5
6/24/96	Ocean Sunrise	Bulker	21,353	83	\$8
6/26/96	Ken Sun	Bulker	22,245	80	\$5.6
6/17/96	Ionian Sky	Bulker	23,200	78	\$2.8
7/9/96	Khudozhnik Gabashvili	Bulker	24,285	79	\$2
7/15/96	Vast Jollity	Bulker	24,648	77	\$5
6/17/96	Nani	Bulker	27,358	78	\$5.3
7/1/96	Port Star	Bulker	27,800	90	\$14.5
6/17/96	Inger	Bulker	29,212	78	\$5.5
7/1/96	Hero	Bulker	31,178	72	\$1.7
7/15/96	Akti	Bulker	33,909	71	\$2.5
7/9/96	Tamasos	Bulker	34,750	84	\$9.4
6/25/96	Martha II	Bulker	41,151	84	\$14.9
7/1/96	Star Centaurus	Bulker	42,592	85	\$14.5
7/1/96	Serenity	Bulker	60,885	74	\$5
7/15/96	Amapola	Bulker	65,187	84	\$12.5
7/9/96	Maritime Grace	Bulker	71,749	90	\$19.6
7/9/96	Asia Union	Bulker	80,346	81	\$8
6/17/96	Stainless Maya	Tanker	7,575	85	\$7.5
7/15/96	Infra	Tanker	12,734	85	\$14
6/17/96	Alfreddie	Tanker	13,339	75	\$5
6/17/96	Normar Sovereign	Tanker	30,990	78	\$7.7
6/17/96	Yuyo Breeze	Tanker	39,016	85	\$16.5
6/17/96	San Antonio	Tanker	47,658	74	\$4.5
7/9/96	A P Moller	Tanker	50,600	84	\$19.5
6/24/96	Bright Sprout	Tanker	60,963	83	\$16
6/17/96	Caripe	Tanker	61,404	81	\$9.9
6/17/96	Urimare	Tanker	61,570	81	\$8.8
6/17/96	Ras Lanuf	Tanker	88,331	74	\$4
6/25/96	Barbro	Tanker	135,000	88	\$36
7/1/96	Atheros Bay	Tanker	140,044	77	\$3.9
6/24/96	Antinea	Tanker	146,097	89	\$33.5
6/24/96	Bridgeton	Tanker	407,323	77	\$11.3

Kvaerner Signs \$200 M Contract With Attica Enterprises

Pictured is an artist's rendition of one of the Superfast ferries to be built for Attica by Kvaerner Masa-Yards.



Kvaerner Masa-Yards Inc. and Attica Enterprises SA have signed a contract worth \$200 million for the building of two SuperFast car/passenger ferries to be named *SuperFast III* and *Superfast IV*. They will be built at the Kvaerner Masa-Yards' Turku New Shipyard, for delivery in 1998. The vessels will be slightly larger than the two existing SuperFast ferries, and will operated in the Greece/Italy market.

For more information on Kvaerner Masa-Yards

Circle 17 on Reader Service Card

ASRY Names New Chief Executive

At a board meeting on June 18, the directors of Arab Shipbuilding and Repair Yard Co. (ASRY)



Al-Khateeb

appointed **Mohamed M. Al-Khateeb** to the position of chief executive officer, effective immediately. The former CEO, Hans Frisk, will reportedly act as an adviser until the end of his contract period in

October.

Mr. Al-Khateeb joined ASRY as board secretary and legal adviser in 1974, before the yard was inaugurated in 1977. In 1984, he was named managing director of ASRY-MAR, ASRY's wholly owned marketing company, a position he will retain.

Mr. Al-Khateeb was appointed deputy chief executive of ASRY in January 1995, and the company has decided not to fill this position following his appointment as chief executive.



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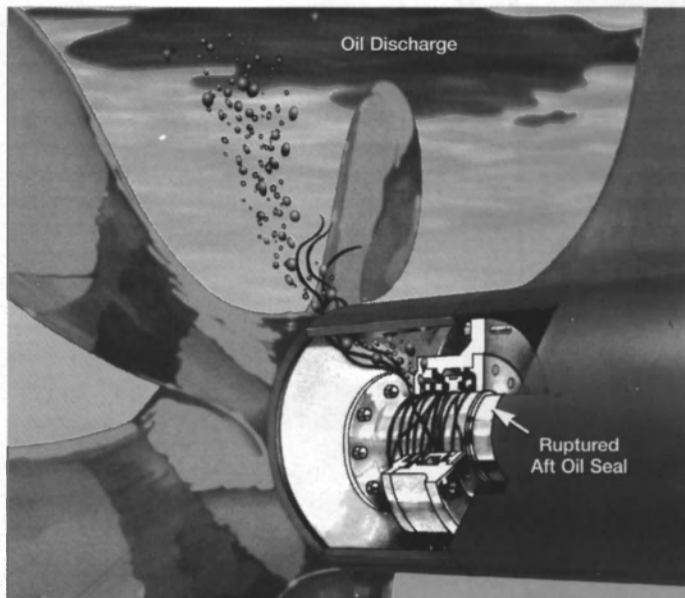
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Construction Of Disney Magic Begins At Fincantieri

According to reports released by Disney Cruise Line (DCL) on July 17, construction of the company's first ship, *Disney Magic*, has begun at Fincantieri shipyards in Ancona and Maghera, Italy. More than 700 tons of steel have already been cut to form the ship's superstructure.

DCL has aggressively approached the design and development of *Disney Magic*, and second ship *Disney Wonder*, with both ships being purpose-built with three distinct audiences in mind to maximize the use of space and offer exceptional accommodations.

"Disney's design work was done far in advance of our contract with Fincantieri. It was only after we considered our three audiences — children, families and adults — that our team of designers determined the size and feel of our ships. The ability to make these concepts a reality became a primary consideration in our shipyard review process," said DCL President **Art Rodney**.

Disney Magic, which sets sail in February 1998, will include 880 staterooms, organized in 12 categories, and reportedly designed to be 25 percent more spacious than the current cruise ship standard. Seventy-three percent of the rooms will be outside staterooms, with almost half of these equipped with verandahs. The ship will have 15,000 sq. ft. dedicated to children, with 30-40 youth counselors on watch. There will also be adult-only areas designated on the ship, including one of the pools.

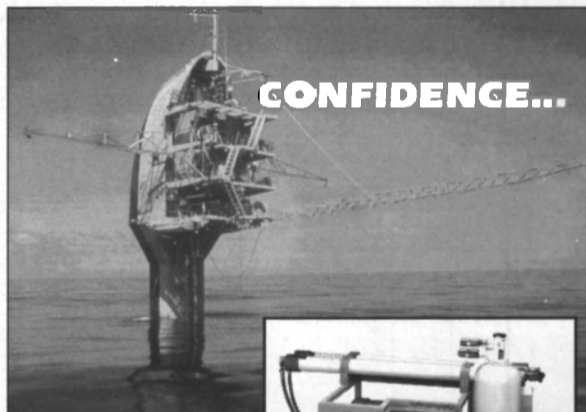
New KMY Moscow Office Celebrates Contract

On June 18, Kvaerner Masa-Yards (KMY) opened its new representative office in Moscow, and signed a contract for ice model tests to be performed by KMY's Arctic Research Centre (MARC) together with the Krylov Research Institute in St. Petersburg. The model tests are related to the startup of the Prirazlomnaya offshore oil field in the Pechora Sea. The contract is reportedly worth approximately \$1 million, and includes model tests at MARC's ice model basin related to the operation of the production platform and offloading from the production platform to ships.

KMY is also working on a development program for new types of "double acting" tankers, to be used for oil transportation from the Prirazlomnaya area in the Barents Sea.

These tankers will operate with stern first in ice and bow first in water.

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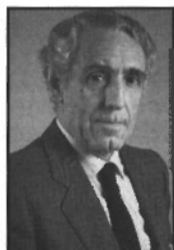
ILS Names Langsen President And CEO

Bruce Langsen was recently named president and chief executive of Inventory Locator Service, Inc. (ILS), a company which provides online services used by the marine and aviation industries to buy and sell parts and equipment. Before accepting this appointment, Mr. Langsen served as executive vice president of ILS, a position he earned after being hired as vice president of Marketing and Sales in 1993.



Langsen

AESA Names New Chairman



Mendoza

Antonio Mendoza has been named as new chairman of Astilleros Espanoles Group (AESA). Educated as a civil engineer, he has held chairship positions with several organizations, including Spanish construction company PASCA, as well as Cadagua, SA; Eurovias; Europistas; and Laing, SA. He has served as vice chairman and CEO of Ferrovial and Autema (Autopista Terrassa-Manresa). Mr. Mendoza has also been a member of the board of the European International Constructors body, and a professor and area director of construction management courses at the University of Madrid.

McLeod Resigns From RCCL

Royal Caribbean Cruises Ltd. (RCCL) announced that Roderick K. McLeod, executive vice president of Sales, Marketing and Passenger Services, resigned. "I have spent many wonderful years with Royal Caribbean and have enjoyed being a part of this exceptional business success. However, my decision to resign is best for me at this time. I look forward to new challenges and opportunities," said Mr. McLeod in a statement released to the press. According to company reports, there will be no changes in the day-to-day operations of the cruise line. Vice President of Sales Michael Applebaum, Vice President of Marketing Adam Goldstein, Vice President of Passenger Services Margarita Navarrete and Vice President of Market Planning and Development Brian Rice will continue to supervise the operation of their respective departments, reporting directly to CEO Richard Fain.

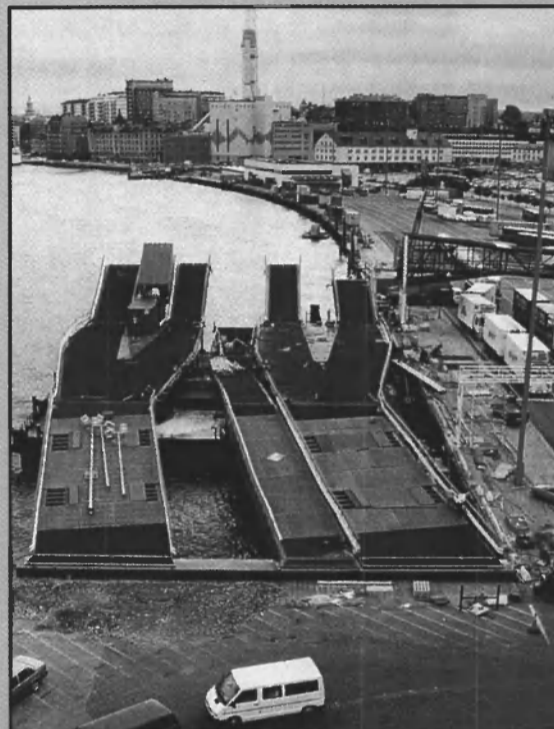
Linkspan For Stena HSS 900 Installed In Göteborg And Frederikshavn

Stena Line's catamaran *HSS 900*, currently under construction at Westamarin AS in Kristiansand, Norway, will be docked to a Norent Floating Linkspan. The linkspans were scheduled to enter service in June, with *Stena Lynx II*, an Incat-built catamaran which has been in service on the Irish Sea. The main part of the linkspan is a pontoon on which a superstructure has been built, containing the access lanes

and ramps between the vessel and the shore extension. Each linkspan is also

equipped with an auto-mooring device acting on bollards on the vessel, eliminating mooring ropes between vessel and wharf.

The linkspan in Göteborg is also outfitted with bunker facilities like fuel and water tanks with pumps. To minimize the service time in harbor, a bunkering manifold has been installed on the linkspan, allowing a fast connection of fuel, water, sewage and bilge. Both linkspans are flexible, moored to the quay with mooring rods. The linkspan can be seen at Stena Line's Denmark terminal, Masthuggskajen, located in Göteborg.



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South America Cruise Seminar '96 (SACS '96): October 22-24, Bahia Convention Center, Salvador, Bahia.

Contact: Feiras e Conferências Internacionais Ltda. (FCI), Av. das

Americas, 1155- Si. 1507 - Barra da Tijuca 22631-000, Rio De Janeiro, Brazil, tel: +55 21 439 9097/9313; fax: +55 21493 8203.

ASNE Flagship Section Symposium: 3rd week of October, Washington, D.C.

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

Seatrade Tanker Industry Convention: October 29-30, Royal Lancaster Hotel,

London, U.K.

Contact: **Michael Kazakoff**, Princeton Forrestal Village, 125 Village Blvd., Suite 220, Princeton, N.J. 08540-5703, tel: (609) 452-9414; fax: (609) 452-9374.

China Portex '96: October 30-November 2, Shanghai, China

Contact: Hamburg Messe und Congress GmbH, Postfach 30 24 80, 203308 Hamburg/Jungiusstraße 13, Germany, tel: +49 040 3569 2190; fax: +40 040 3569 2187.

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Ausmarine '96: November 4-6, Fremantle, Australia. Contact: Baird Publications, 10 Oxford St., South Yarra 3141, VIC, Australia, tel: +61 39 826 8741; fax: +61 39 827 0704, or in the U.K. at 4A Carmelite St., London, EC4Y 0BN, tel: +44 171 353 1085; fax: +44 171 353 1084.

Ship Repair & Conversion 96: November 5-6, Olympia 2 Conference and Exhibition Centre, London, U.K. Contact: **John Gwynn-Jones**, BML Business Meetings Ltd., 2 Station Rd., Rickmansworth, Hertfordshire WD3 1QP, U.K., tel: +44 923 776 363; fax: +44 923 777 206.

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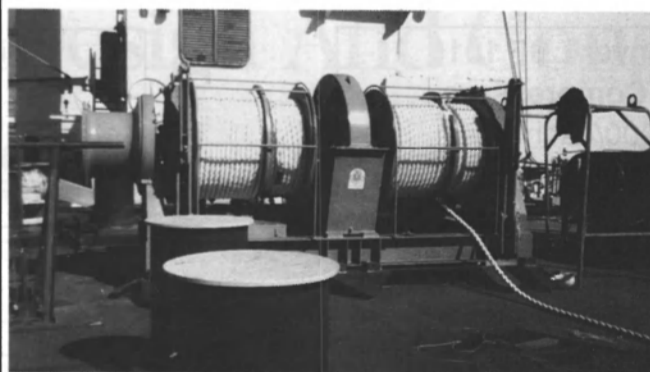
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ITS Set For September

In early September, Seattle will host a collection of maritime events, including the 14th International Tug & Salvage Convention and Exhibition (ITS '96), Superyacht Northwest '96 and Workboat Northwest '96. All three events will be held during the same week at the new Bell Harbor facility on the waterfront in downtown Seattle. ITS '96 will run from September 9 to 13, and Superyacht Northwest '96 and Workboat Northwest '96 will take place from September 11 to 14. Trade visitors to one event will be given complimentary access to the other two.

Workboat Northwest '96 will be housed in a tented structure on the apron adjacent to the Bell Harbor International Conference Center, and the organizers of ITS '96 have reserved 800 ft. of mooring space alongside the apron so that local tug owners can moor their craft.

For more information on Workboat Northwest, contact **Kristie Ferguson**, tel: (206) 827-3200; fax: (206) 827-7455.

For more information on ITS '96, contact the ITS '96 Secretariat at tel: +44 (0) 181 941 7878; fax: +44 (0) 181 941 8787.

World Ferry Operators To Meet In Vancouver

Ferry operators from around the world will convene in Vancouver from September 22-25 for the 21st Annual Meeting of the International Marine Transit Association (IMTA). **Frank J. Rhodes**, president of the association, recently announced details of the conference program, and extended an invitation to public and private transportation agencies, corporations and ferry operators to join the information exchange.

"This gathering of ferry operators, large and small, offers a unique opportunity to learn what's new and what's working, and how to approach operational problems or challenges," said Mr. Rhodes. He also acknowledged the IMO's recent recognition of the event. "We are delighted to have been honored with the grant of consultative status by the IMO, and look forward to participating in and contributing to future deliberations ... We will recognize IMO's World Maritime Day theme, *Achieving Excellence Through Cooperation*, in our proceedings," added the IMTA leader.

The conference will focus on issues of marine safety and design, new fast ferry technologies — including the Stena HSS — and urban ferry systems. A hands-on opportunity to investigate ferries of the Pacific Northwest will be offered, in addition to special presentations to be given by officers of the ferry systems of Alaska, British Columbia, Washington state and private ferry operators of Puget Sound. The event organizers expect Chinese ferry operators, representatives from Europe's International Union of Public Transport and members from the U.S.-based Transportation Research Board's Committee on Ferry Transportation to be in attendance.

For information on the IMTA conference schedule, contact RADM. **Michael Martin** at B.C. Ferries, tel: (604) 381-1401; fax: (604) 381-7238. For registration information, contact the IMTA Conference Secretariat at tel: (604) 681-5226; fax: (604) 681-2503.

Sea-Hornet Equips West Coast Superferry

B.C. Ferries' *Spirit of British Columbia* has been equipped with Sea-Hornet Marine Industries Inc.'s IVR-6600 Integrated Voyage Recorder. The vessel is reportedly the first in the world with such a complete voyage data recording system.

Using digitized data captured from the vessel's onboard radar receivers during an actual voyage, Sea-Hornet engineers reconstructed radar displays of that voyage on an IVR-6600 Playback Station at their North Vancouver facility. In addition to raw radar signals, the IVR-6600 also simultaneously acquires, digitizes and stores continuous video camera feeds, microphone outputs, radar screen images, GPS navigational data, and engine and operational information. The system may be configured for a wide variety of marine applications, from workboats to cruise ships to military vessels.

Sea-Hornet also received a letter of intent from B.C. Ferries to install this voyage data recording system on the majority of its fleet.

For more information on Sea-Hornet Marine Industries
Circle 88 on Reader Service Card

BOATRACS Contracts With Mid-South Towing

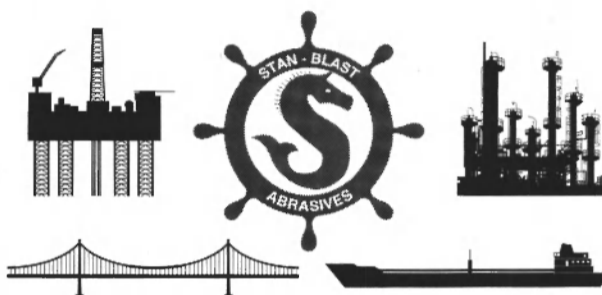
Mid-South Towing has signed a contract to purchase and equip its entire fleet with BOATRACS satellite-based marine communications and tracking systems. After testing and evaluation, Mid-South Towing, a river marine transportation company, decided to equip its fleet with the BOATRACS system to increase efficiencies and enable quicker response to customers' needs.

"The BOATRACS system is a valuable addition to our fleet operation," said **Mike Marshall**, senior port captain of Mid-South. "With the addition of BOATRACS, we are able to reliably and conveniently communicate with our entire fleet within minutes."

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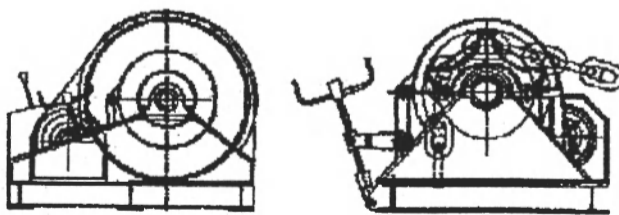


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Marine Educators Turn Attention To Next-Generation Personnel

by Bridget A. Murphy, associate editor

While the industry concentrates on creating more efficient technology and increasing profit margins — with environmental and safety concerns also creeping to the crowded forefront — recruitment of future mariners, scientists, engineers and executives has fallen by the wayside. This shortage of maritime personnel is a serious matter, since companies seem unwilling to turn leadership over to non-maritime management, as evidenced by the industry's failure to embrace the idea of outside management audits under the International Maritime Organization's (IMO's) International

Safety Management (ISM) Code.

Helmut Sohmen, chairman of World-Wide Shipping Agency Ltd., emphasized the need to recruit personnel in his address at Shipping '96. "What the shipping industry needs in the short term ... are good communicators with political connections ... So if we want to experience a new era in shipping, let us search for and employ these miracle men and women," urged Dr. Sohmen.

Educational institutions being a reasonable place to begin the search for young leaders capable of taking on the challenges posed by the modern maritime world,

MR/EN has ventured inside one program dedicated to introducing marine disciplines to young people and preparing university students for careers in maritime-related disciplines.

Los Angeles, Calif.-based Occidental College has developed a program designed to act as an operational seagoing classroom for the youth of Southern California, focused on providing students of all ages with practical working experience at sea and an opportunity to investigate indigenous marine life, with an overall emphasis on environmental monitoring. Considering the location of the

school and the fact that the term "occidental" traces its meaning back to a description of western culture, this account was selected as the focus for *MR/EN's* annual West Coast Maritime Review.

Fishing For Interested Parties

In 1969, **Gilbert Van Camp** of the Van Camp tuna enterprise donated his private fishing vessel, built in 1962 at Ditmar & Donaldson in Costa Mesa, Calif., to Occidental College for use as a teaching resource. With a National Science Foundation grant, the vessel was promptly converted for oceanographic use and named *Vantuna* in honor of its donor. As explained by *Vantuna* Program Coordinator **Janice Grancich**, the vessel is used by Occidental students, as well as is rented out, at very low cost, to other schools and institutions in the area.

"It's meant first and foremost as an educational outreach for schools who don't have a boat and would like that opportunity," said the Occidental official.

She said that many of the participants come from inner city Los Angeles and have never been out on the ocean before. In addition to voyages conducted by the vessel owners, this year 18 voyages have been booked by four-year colleges, 71 have been booked by two-year colleges, and grammar schools and high schools combined account for 30 reservations. Government institutions and private industry also reserve voyages for exploration of the Southern California Bight, which evidences the high quality of resources available onboard the vessel.

With a full-time captain and engineer assigned to *Vantuna*, a lot of attention is paid to vessel maintenance, particularly the propulsion system of the 34-year-old ship. The program coordinator said that while the vessel's CAT engines are old, they still work very well, and pointed out that keeping *Vantuna* in good working condition is a major priority. "Every year it gets drydocked for a month. It's maintained very well," said Ms. Grancich.

Netting Next-Generation Leaders

In addition to *Vantuna's* hectic chartering schedule, every year for the past 22 years, five weeks of the vessel's time has been devoted to Occidental's summer oceanology program, an intensive program directed at encouraging top-grade high school seniors to explore the possibility of committing to marine science studies at the university level. This year, a group of 30 has gathered from all reaches of the country, coming to the West Coast from as far away as New York and

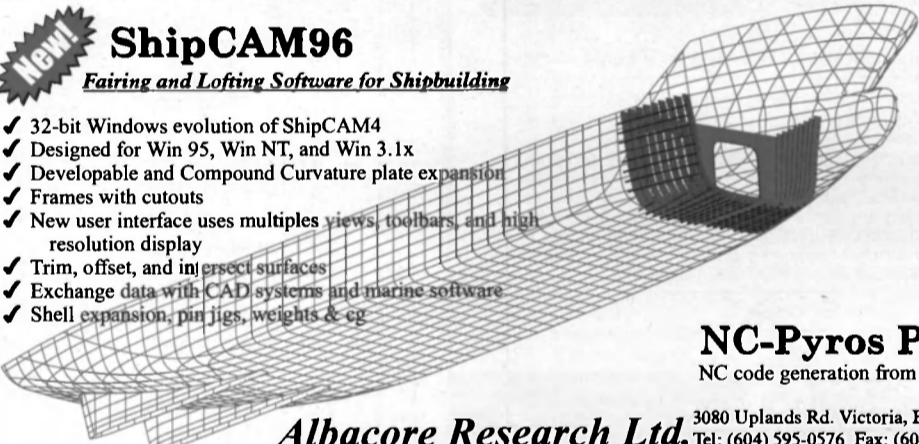
(*Vantuna* vessel specifics next page, main story continued on page 99)

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U.S. WEST COAST MARITIME REVIEW

R/V Vantuna Specifications

Length	85 ft. (25.9 m)	Fathometer	Konel/Furuno F850F
Beam at deck	23 ft. (7 m)	Raytheon V820 Color
Main engine	Caterpillar twin 460-hp diesels	VHF direction finder	EPSCO
Power source	John Deere, Caterpillar	VHF radio	EPSCO
Cruising speed	10 knots	VHF-FM/ADF radio	Polaris
Working space	Galley (9 x 10 ft.)		
.....	Lounge (7 x 12 ft.)		
.....	Covered deck (7.5 x 15.5 ft.)		
.....	Fantail (20 x 20 ft.)		
Hydraulic "A" frame weight capacity ..	8,000 lbs.		
Winches	Swan series hydrographic		
.....	(5,000 ft. of 5/32 in. cable)		
.....	oceanographic		
.....	(7,500 ft. of .5 in. cable, 5,900 lbs.		
.....	mid-drum at 100 fpm load cap.)		
		Scientific Equipment Sampling	
Navigation/Communications Equipment		Nets	Bongo and Manta
GPS	Magellan NAV 5200 D	Otter trawls	16 and 25-ft. units
Radar	EPSCO (36-mi.)	Sorting screens	rough and precision
.....	Raytheon (24-mi.)	Deep sea reversing thermometers ..	protected and
		unprotected
		Bathythermographs	140m, 280m
		Microscopes	dissecting and compound
		Biological Dredges	3 x 5-ft. opening
		Dredge	Wildco Peterson
		Bottom grabs	Shipek, Van Veen
		Water sampler	Van Dorn
		Induction salinometers	Beckman
		pH meters	Corning and Orion

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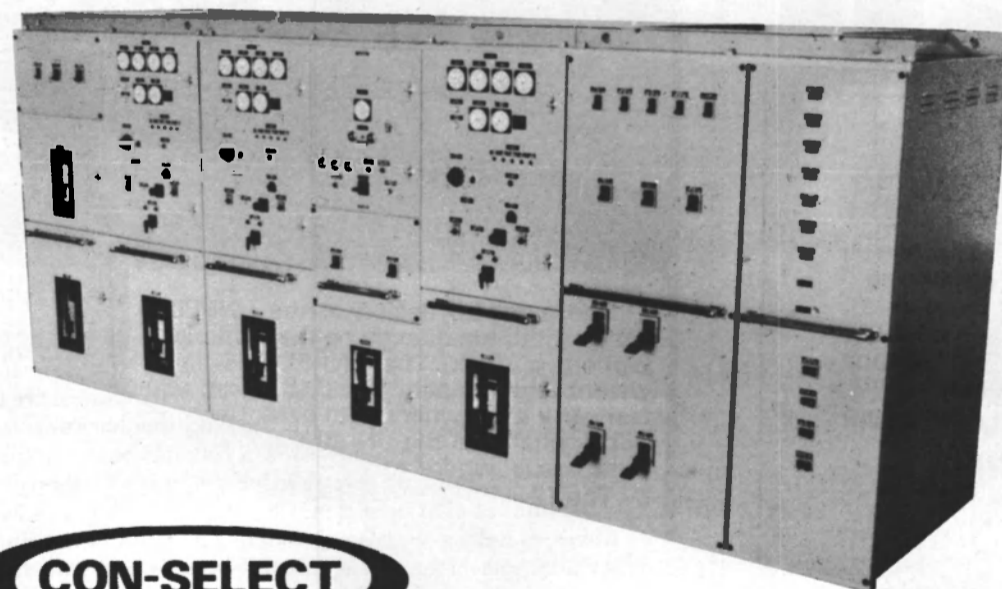
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Principal Contracts Recorded, June 1996

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Owner/ Operator	Country (Owner)	Shipyard	Country (Shipyard)	Ship Type	No.	Delivery Date	Price \$M
EGON OLDENDORFF	GERMANY	MANGALIA-2 MAI	RUMANIA	BULK CARRIER	3	1997	54
FAR EASTERN SILO	TAIWAN	IMABARI	JAPAN	BULK CARRIER	2	1998	51.4
HYUNDAI M. M.	KOREA	HALLA	KOREA	BULK CARRIER	1	1997	—
INTERNATIONAL BULK TRANSPORT	GERMANY	CANECO-RIO/THYSSEN	BRAZIL	BULK CARRIER	6	1998	132
NISSHIN KAIUN	JAPAN	SUMITOMO	JAPAN	BULK CARRIER	1	1998	—
RAINBOW MARITIME	JAPAN	SAIKI	JAPAN	BULK CARRIER	1	1997	—
SAFMARINE	SOUTH AFRICA	TSUNEISHI	JAPAN	BULK CARRIER	2	1997	47
SAFMARINE	SOUTH AFRICA	TSUNEISHI	JAPAN	BULK CARRIER	2	1998	50.5
U-MING MARINE TRANSPORT	TAIWAN	CHINA SHIPB. CORP.	TAIWAN	BULK CARRIER	1	1997	42
UGLAND BULKCARRIERS	NORWAY	mitsui	JAPAN	BULK CARRIER	1	1997	??
UNKNOWN	—	KANDA SHIPBUILDING CO.	JAPAN	BULK CARRIER	1	1997	—
KOWA KAIUN	JAPAN	KANDA SHIPBUILDING CO.	JAPAN	BULK CARRIER	1	1996	—
SINGA SHIP MANAGEMENT	NORWAY	ZHONGHUA SHIPYARD	CHINA	BULK CARRIER	2	1998	—
EGON OLDENDORFF	GERMANY	WUHU	CHINA	BULK CARRIER	2	1998	31
UNKNOWN	TURKEY	ALABAMA SHIPYARD	U.S.	BULK CARRIER	2	—	53.4
OCEAN GIANT	—	ONOMICHI	JAPAN	BULK CARRIER	2	1997	37
CANADIAN STEAMSHIP	CANADA	JIANGNAN	CHINA	BULK CARRIER	1	1998	43
PAN OCEAN SHIPPING	KOREA	HANJIN	KOREA	BULK CARRIER	1	1997	26
FAR EASTERN SILO	TAIWAN	IMABARI	JAPAN	BULK CARRIER	2	1998	56
MISC	MALAYSIA	SUMITOMO	JAPAN	BULK CARRIER	4	7/98	114
HYUNDAI M. M.	KOREA	HALLA	KOREA	BULK CARRIER	1	1997	26
MARITIME CREDIT CORP.	JAPAN	WAVEMASTER	AUSTRALIA	CATAMARAN	1	—	4.9
STOLT NIELSEN	NORWAY	AESA - SESTAO	SPAIN	CHEMICAL	3	1998	144
KAWASAKI KISEN KAISA (K-LINE)	JAPAN	KAWASAKI H.I.	JAPAN	COAL CARRIER	1	1/98	30
mitsui O.S.K. LINES (MOL)	JAPAN	mitsui	JAPAN	COAL CARRIER	2	1998	—
NYK LINE	JAPAN	IMABARI	JAPAN	COAL CARRIER	1	1998	30
BERNHARD SCHULTE	GERMANY	STOCZNIA	POLAND	CONTAINER	1	1998	—
BERTRAND RICKMERS	GERMANY	CHINA SHIPB. CORP.	TAIWAN	CONTAINER	6	1998	210
HANSA TREUHAND	GERMANY	HANJIN	KOREA	CONTAINER	4	1998	120
HANSA/SCHLUSSEL RED.	GERMANY	HYUNDAI	KOREA	CONTAINER	1	04/97	35
HORST ZEPPENFELD	—	SEDEF GEMI	TURKEY	CONTAINER	2	1997	26

(Continued on page 105)



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Marco Signs Recovery Vessel Contract With Clean Bay Inc.

Seattle-based Marco Pollution Control has signed a contract to build a new oil spill recovery vessel for Clean Bay Inc., an organization made up of oil refineries and transportation companies in the San Francisco Bay area.

The new vessel, designated the Coastal 48 Oil Spill Recovery Vessel, is similar to the two Marco Coastal 42 vessels previously delivered to Clean Sound Cooperative of Washington state. The 48-ft. (14.6-m) semi-catamaran hull will be all aluminum and will utilize Marco's unique Filterbelt oil and debris recovery system. The Filterbelt recovers all types of oils, from light distillates to heavy weathered crude and Bunker C. Reportedly one of the most effective skimming systems available, the Filterbelt takes care of primary separation of oil from water during recovery. Oil and debris adhere to the moving belt and are brought aboard the vessel, while water passes through.

"The versatility of the Marco Coastal 48 is key for San Francisco Bay," said Steve Ricks, president of Clean Bay Inc. "This vessel will stand by oil tanker lightering operations and provide near shore response capabilities with its relatively shallow draft."

The new boat will have an overall length of 48.8 ft. (14.8 m), a beam of 15 ft. (4.6 m) and a molded depth of 4.7 ft. (1.4 m). It will carry a normal operating crew of two, and will be capable of storing up to 50 barrels of recovered product. Delivery is scheduled for December of this year.

For more information on Marco Pollution Control
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U.S. WEST COAST MARITIME REVIEW

(Continued from page 96)

Michigan, to study the general principles of scientific classification, chemical and physical oceanography, marine ecology and the effects of pollution. The course includes lectures, lab work and hands-on field work, involving animal and fish dissection, shark and dolphin observation, and other activities focused on getting to know the organisms in the Pacific area layout.

One of the main acknowledgements of the program is that both the fishing and shipping industries can be adversely affected by the deterioration of the environment, and that the disposal of society's wastes is a major consideration in the planning and maintenance of beach and boating facilities. According to **Gary Martin**, professor of biology and director of the program, students are often surprised that life exists at all in the Los Angeles waters that are known to be polluted. He teaches them that in these areas "a different assemblage of organisms is found because of pollution," and challenges them to assess the effects of pollution by asking the question, "How can you prove it's polluted — how would you test it?"

Applying Scientific Principles To Industrial Processes

As part of the program's objective to teach stu-

dents to monitor the environment, several experiments are conducted during the five-week course, including sampling fish from the world's largest known DDT zone, treating sea urchin gametes with suspect pollutants and observing the fertilization rate, and looking at stress proteins produced in response to heavy metal or pesticide presence in ocean waters. Sea urchins, bacteria, coccopods and fish with high-level pollutants all serve as commonly collected specimens.

But beyond experiments and studies of scientific principles, another objective of Occidental's program is to demonstrate how these skills translate into professional life.

"We try to pull in a speaker a week to talk to the students about their area of expertise," said Dr. **Martin**.

Past speakers have included a toxicologist who worked on the *Valdez* oil spill, a salmon fishery employee, a water treatment plant employee, a DNA expert who demonstrated how to remove the substance from fish, and an individual skilled in following fish populations with satellite technology.

While most of the speakers are those in

the industry "just passing through the area," Dr. **Martin** and other program officials like **Dan Pondella**, director of the *Vantuna* Research Program, reportedly make an effort to enlist speakers who can capitalize on specific student interests.

This summer, participants will hear an expert speak about the Marine Mammal Protection Act.

Vantuna Student Log Sample

Dateline: Los Angeles, CA; July 1, 1996

"... An afternoon trip to Marina Del Rey brought the Beach Seine. After swimming the 100 x 6-ft. net out, we dragged it back in to see what we could see. And we saw. There were many mullets, ranging from a few inches to a foot long. Killies were everywhere; we also made our acquaintances with the sting rays — one casualty. Two fish were logged and measured, frozen and saved for labs."

Dateline: Los Angeles, CA; July 2, 1996

"... This morning we began trekking at 6:50 a.m. — off to San Pedro to board the Vantuna. We performed mid-water and bottom trawls, as well as rock dredges, and came up with all kinds of interesting creatures: from urchins and sea cucumbers to big starfish and small octopi, with plenty of fish and thousands of shrimp. Many of these were measured, and the invertebrates, as well as some poisonous aquatics, were tanked and returned to the labs. A rough trip for some — this all happened inside and just beyond Los Angeles Harbor, mostly between San Pedro/the Rock Slides (Patos Verdes) and Catalina. Tomorrow we are getting up and out at 4:45 a.m. to go tide pooling at low tide."



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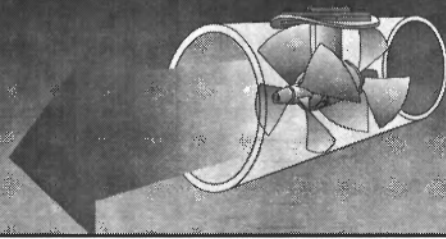
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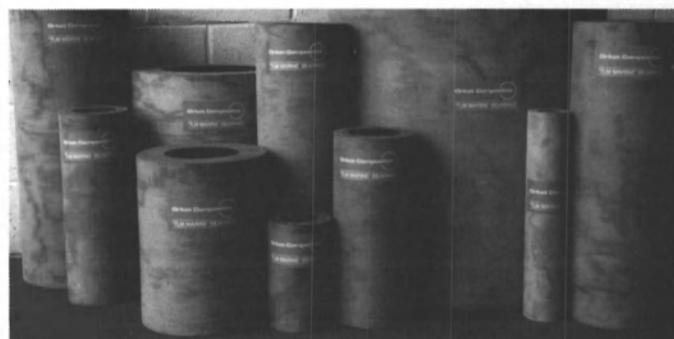
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Proteus Engineering, 301 Pier 1 Rd., Stevensville, MD 21666
Sener, C/Severo Ochoa, 4 Parque Tecnologico de Madrid, 28760 Tres Cantos - Madrid SPAIN
ADMAX Computer Inc., One Chestnut St., Nashua, NH 03060

CONSOLE—GMDSS

Sea, Inc., 7030 220th S.W., Mountlake Terrace, WA 98043

CONTROL SYSTEM—Monitoring

Engine Monitor, Inc., 179 Hickory Ave. Harahan, LA 70123
GEC ALSTHOM Diesels Inc., 10801 Kempwood Drive, Suite 1, Houston, TX 77043-1412
Ian-Conrad Bergan, 3409 Gulf Breeze Pkwy, Gulf Breeze, FL 32561
IMO Industries, Gems Sensors Division, One Cowles Rd., Plainville CT 06062
MMC International, 60 Inip Dr, Inwood NY 11696
Robertson Marine Systems, 3000 Kingman St., Suite 207, Metairie, LA 70006
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029

CONTROL SYSTEM—Steering

Engine Monitor, Inc., 179 Hickory Avenue Harahan, LA 70123
Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068

CONTROL VALVES

Leslie Controls, 12501 Telecom Dr., Tampa, FL 33637

CONVERSIONS A REPAIRS

Vancouver Shipyards, 50 Pemberton Ave., N. Vancouver, B.C. CANADA V7P 2R2

CORROSION CONTROL

Corrosec Inc., 1045 12th Ave. NW #F5A, Issaquah, WA 98027

TMT Services Corp./RUSTECO P.O. Box 11398, Torrance, CA 90813

COUPLINGS

American Vulkan, P.O. Drawer 673, Winter Haven, FL 33882
Haley Clutch and Coupling Corp., 1820 Hwy. 1 North, Greenville, MS 38702
Mapeco Products, 90 Forest Avenue, P.O. Box 382, Locust Valley, NY 11560
Tylok International, 1061 East 260th Street, Euclid, OH 44132

CRANE—HOIST—DERRICK—WHIRLEYS

Bisso Marine Co. P.O. Box 4113, New Orleans, LA 70178
Del Gavio Marine Hydraulics Inc., 619 Industrial Rd., Carlstadt, NJ 07072
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150

CRANES

Clarke Chapman Canada, 1075 North Service Rd. West, Oakville, Ontario CANADA
Lakeshore, Inc., P.O. Box 809, Iron Mountain, MI 49801
T.C.W., 1607 port Barmouth Pl., Newport Beach, CA 92660
Tech Crane Int'l., Inc., 61130 Timberbend Dr., Lacombe, LA 70445

CRANKSHAFT DEFLECTION ANALYZER

FCS, Inc., 22 Main St., Centerbrook, CT 06409

CRANKSHAFT REPAIR

Gottens Worldwide, 160 Van Brunt St., Brooklyn, NY 11231
In-Place Machining Co., Inc. 1929 North Buftum Street, Milwaukee, WI 53212-3793

DECK CAULKING/REPAIR

Life Industries, Corp., 2081 Bridge View Dr., N. Charleston, SC 29405

DECK MACHINERY—Cargo Handling Equipment

Lakeshore, Inc., P.O. Box 809, Iron Mountain, MI 49801
Markey Machinery Co., Inc., P.O. Box 24788, Seattle, WA 98124-0788
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
Smith Berger Marine Inc., 516 South Chicago Street, Seattle, WA 98108

DECK MACHINERY

Clarke Chapman Canada, 1075 North Service Rd. West, Oakville, ONTARIO CANADA
Intercontinental Engineering, P.O. Box 9055, Kansas City, MO 64168
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
Pusnes, PO Box 102, N-4818, Faervik, NORWAY
Smith Berger Marine Inc., 516 South Chicago St., Seattle, WA 98108
T.C.W., 1607 Port Barmouth Pl., Newport Beach, CA 92660
Timberland Equipment, P.O. Box 490, Woodstock, Ontario N4S 7Z2 CANADA
Waterman Supply Co., P.O. Box 596, Wilmington, CA 90748

DESALINATION - REVERSE OSMOSIS

Lifestream Watersystems, Inc., P.O. Box 634, Huntington Beach, CA 92647
Matrix Desalination, 3295 S.W. 11th Ave., Fort Lauderdale, FL 33315

DIESEL ACCESSORIES

General Thermodynamics Corp., 210 South Meadow Rd., P.O. Box 1105, Plymouth, MA 02360
Gene Diesel Accessories, 325 S. Fairbanks St., P.O. Box 386, Addison, IL 60101

DIESEL ENGINE ANALYZER

FCS, Inc., 22 Main Street, Centerbrook, CT 06409

DIESEL ENGINE—Spare Parts A Repair

Alaska Diesel, 4420 14th Ave., NW, Seattle, WA 98107
Caterpillar, Inc., Engine Div., P.O. Box 610, Mossville, IL 61552-0610
Collec Industries, 701 Lawton Ave., Beloit, WI 53511
Cummins Engine Co., 4500 Leeds Ave., Ste. 301, Charleston, SC 29405-8521
Cummins Mid-South, Inc., 110 E. Airline Highway, Kenner, LA 70062
John Deere, John Deere Rd., Moline, IL 61265
DMI Norshippo Co., P.O. Box 2100, Norfolk, VA 23501-2100
GEC Transportation Systems, 2901 East Lake Rd., Erie, PA 16531-0001
GEC ALSTHOM Diesels Inc., 10801 Kempwood Drive, Suite 1, Houston TX 77043-1412
Gottens Worldwide, 160 Van Brunt St., Brooklyn, NY 11231
GTC Chemical Services, Inc., 8920 Lawndale Suite A, Houston, TX 77012
In-Place Machining Co. Inc. 1929 North Buftum Street, Milwaukee, WI 53212-3793
Kiene Diesel, 325 S. Fairbanks, Addison, IL 60101
Klattenberg Marine, 17 Grandview Ave., W. Orange, NJ 07052
MAN B&W Diesel AG, Stadtbachstrasse 1, D-86153 Augsburg 1, GERMANY
MAN B&W Diesel A/S, Tegholmsgade 41, DK-2450 Copenhagen SV, DENMARK
MAN B&W Diesel, 17 State St., New York, NY 10004
Motor-Service AB, Box 2115, S-144 04 Ronninge, SWEDEN
Motor-Service-Hugo Stamp, 3190 S.W. 4th Ave., Ft. Lauderdale, FL 33315
Nor-Tech, Inc., 100 Wall St., New York, NY 10005
Paxman Diesels, P.O. Box 8, Paxman Works, Colchester, Essex, CO1 2HW, ENGLAND
Ulstein Bergen AS, PO Box 924, N5002 Bergen, NORWAY
Wartsila Diesel, 201 Defense Highway, Annapolis, MD 21401

DISPUTES ANALYSIS

Resolution Management, 11 Eves Drive Suite 140, Marlton, NJ 08053

DIVING A SALVAGE

Bisso Marine Co. P.O. Box 4113, New Orleans, LA 70178
H.J. Merrhue, P.O. Box 23123, New Orleans LA 70183
JW Fishers, 65 Anthony St., Berkley, MA 02279
Muldoon Marine Services, Inc., P.O. Box 3221, Terminal Island, CA 90731

DOORS - MARINE A INDUSTRIAL

Branton Ind., 1101 Edwards Ave., Jefferson, LA 70181
Insulations, Inc., 1101 Edwards Ave. Harahan, LA 70123
Mapeco Walz & Krenzer, Inc., 90 Forest Ave., Locust Valley, NY 11560

DRIVE SHAFTS

Aquadrive Systems, 17 Ave. D, Atlantic Highlands, NJ 07716

DRY DOCKS—Design

Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381
Crandall Dry Dock, 2 Williams St., Chelsea, MA 02150

EDUCTORS

Vita Motivator, 566 Parker St., Newark, NJ 07104

ELECTRICAL EQUIPMENT

L. F. Gaubert & Co., Inc., P.O. Box 50600, New Orleans LA 70150
MMC International, 60 Inip Dr, Inwood NY 11696

ELECTRONICS/ELECTRONIC DISPLAY

Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
Scandinavian Micro Systems, P.O. Box 135, N-1411, Kolbotn, NORWAY

ELECTRONIC INFORMATION SUPPORT

Scandinavian Micro Systems, P.O. Box 135, N-1411, Kolbotn, NORWAY

ELEVATOR SERVICE

Aimak Elevator Co., 1100 Boston Ave., Idrigeport, CT 06610
Millar Elevator Service, 840 South Military Trail, Deerfield Beach, FL 33442

EMISSION CONTROLS

ABB Flakt Marine, Box 1043, S-436 21 ASKIM SWEDEN
Haldor Topsoe Nymollevil 55, DK-2800, Lyngby, Denmark

EMPLOYMENT

Boat Crews, 1 Seine Court, Suite 309, New Orleans, LA 70114
Marine Jobs, Inc., 800 Downtown Blvd. Ste. 111, Mobile, AL 36609

ENGINEERING SERVICES / MARINE ENGINEERS

Kvaerner Masa Marine Inc., 201 Defense Highway, Suite 202, Annapolis, MD 21401
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029

ENGINE - EFFICIENCY/TEST EQUIPMENT

Collec Industries, 701 White Ave., Behoit WI 53511
General Thermodynamics Corp., P.O. Box 1105, Plymouth, MA 02360
Stellar Marketing, 7759 Townsend Place, New Orleans, LA 70126

ENGINE ROOM LIGHTING

Pauluhn Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearlman, TX 77581

EPIRBs

ACR Electronics, Inc., 5757 Ravenswood Rd., P.O. Box 5247, Ft. Lauderdale FL 33310-5247

EVAPORATORS

Alfa-Laval Separation, Inc., 955 Mearns Rd., Warminster, PA 18974
Beard Industries Inc., P.O. Box 31115, Shreveport, LA 71130

FANS - VENTILATORS - BLOWERS

ABB Flakt Marine, Box 1043, S-436 21 ASKIM SWEDEN
Jon M. Liss Associates, Inc., 411 Borel Ave., San Mateo, CA 94402

FASTENERS

Jamestown Distributors, 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835
Okabe Co., Inc., 645 Forest Edge Drive, Vernon Hills, IL 60061-3106

FENDERING SYSTEMS/BUOYS—Dock & Vessel

B.F. Goodrich, 150 Division Drive, Wilmington, NC 28401
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Schuyler Mfg. Co., Inc., 16901 Woodville Redmond Rd., Woodville, WA 98072
Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook, WA 22624
Ultra Poly Inc., 2926 South Steele, Tacoma, WA 98409
Viking Fender Co., 1160 State St., Perth A'boy, NJ 08861

FIBERS

Allied Signal, Meyer I Box, 101 Columbia Rd., Morristown, NJ 07962

FILTER SYSTEMS

Everpure Inc., 660 N. Blackhawk Dr., West nort IL 60559
Luber-Finer, Inc., 5050 Quorum Drive, Dallas, TX 75240

FIN STABILIZERS

Blohm & Voss Industrie GmbH, P.O. Box 100720, D-2000 Hamburg 1, GERMANY
U.S.A. Repts: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168

FIRE RESISTANT PANELS

Thermax N.A., 13115 Dulany Valley Rd., Clen Arm, Baltimore, MD 21057

FIRE SUPPRESSION AGENT

American Pacific Corp., 3770 Howard Hughes Pkwy, Las Vegas, NV 89109

FLAME CUTTING MACHINES

Bug-O-Systems, 3003 West Carson St., Pittsburg, PA 15204

FLEXIBLE COUPLINGS

American Vulkan, P.O. Drawer 673, Winter Haven, FL 33882

FUEL CONSERVATION

Walz & Krenzer, Inc., 90 Forest Ave. Locust Valley N.Y. 11560

KEEL COOLERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 52421
The Walter Machine Co., Inc., 84-98 Cambridge Avenue, Jersey City, NJ 07307

LIFEBOATS/RAFTS
American Eagle Mfg., Inc., 780 Pearle Jensen Way, LaConner, WA 98257
Dunlop Beaufort, 12351 Bridgeport Rd., Richmond, B.C. CANADA V6V1J4
Norsale AS, P.O. Box 115, N-4818 Faervik, Norway
Viking Life Saving Equipment, 1625 N. Miami Ave., Miami, FL 33136
Willard Marine Co., Inc., 1250 N. Grove St., Anaheim, CA 92806
Zodiac of North America, P.O. Box 400, Stevensville, MD 21666

LIFESAVING EQUIPMENT
MGI International, 119-225 West 1st St., North Vancouver, B.C. CANADA
Stearns Manufacturing, P.O. Box 1498, St. Cloud, MN 56302

LIGHTING SYSTEMS / EQUIPMENT—Lamps, Fixtures, Searchlights
ACR Electronics, Inc., 5757 Ravenswood Rd., Ft. Lauderdale, FL 33310-5247
Archway Marine, 4501 Swan Ave., St. Louis, MO 63110
Datrex Inc., P.O. Box 1150, Kinder, LA 70648
Golten Marine, 160 Van Brunt St., Brooklyn, NY 11231
Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
L.C. Doane, P.O. Box 975, Essex, CT 06426
Pauluhn Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearland, TX 77581
Francis Searchlights/Stam Supply Co., 4415 6th N.W., Seattle, WA 98107

LIQUID LEVEL GAUGES
King Engineering Corp., P.O. Box 1228, Ann Arbor, MI 48106

LIQUID LEVEL INDICATORS
Midland Mfg. Corp., 7733 Gross Point Rd., Skokie IL 60076-0226

LIQUID OVERFILL PROTECTION SYSTEMS
E.R.L. Marine Products, P.O. Box 1026, New Albany, IN 47151-1026
Metritape, Inc., 59 Porter Rd., Littleton, CO 81460
Midland Mfg. Corp., 7733 Gross Point Rd., Skokie IL 60076-0226

LOGISTICS
Newport News Shipbuilding, 12129 Jefferson Ave., Newport News, VA 23603
VL Logistics Consultants, Inc., 3420 Bienville Blvd., Ocean Springs, MS 39564

LUBRICANTS
Exxon Co. USA, 800 Bell St., Houston, TX 77002
Royal Lubricants, P.O. Box 518, East Hanover, NJ 07936

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
Del Gavio, 619 Industrial Rd., Caristadt, NJ 07072
Golten Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231
Maritime Power 200 Henderson St., Jersey City, NJ 07302
New England Tractor Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
Wallace Coast Machining, 1920 Waukegan Rd., Glenview, IL 60025

MARINE ACCOMMODATIONS
Hopeman Brothers, P.O. Box 820, 435 Essex Ave., Waynesboro, VA 22980
Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807
Jamestown Metal Marine Sales, Inc., 4710 Northwest Second Ave, Boca Raton, FL 33431
Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031

MARINE CEILING
Hydro-Aluminium, Vik Verk, N-5880 VIK I SOGN, Norway
Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807

MARINE DECKING
E.H. O'Neill Co., Inc., 1405 Chippendale Road, Lutherville, MD 21093
Hopeman Brothers, Inc., P.O. Box 820, Waynesboro, VA 22980
Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807
Selby, P.O. Box 1600, Sapulpa, OK 74067

MARINE DOCKING
Tribar Industries, 1705 Flint Rd., Downsview, Ontario CANADA

MARINE DRILLING & BLASTING
Marine Drilling & Blasting, Inc., P.O. Box 10455, Jacksonville, FL 32247-0455

MARINE ELECTRONICS
Frank L. Beier Radio, 2001 Ridgelaque Drive, Metairie, LA 70001
Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
Marine Electronics Solutions, Inc. 1522 Crabapple Cove, Jacksonville, FL 32225
Saab Marine Electronics AB, Box 13045, 402 51 Göteborg, SWEDEN
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029

MARINE ELEVATORS
McElroy Machine, 1101 Lorraine Rd., Biloxi, MI 39535-4454

MARINE EQUIPMENT
Bohnet & Associates, 1150 Rule Rochelle, Sidell, VA 70458
McElroy Machine, P.O. Box 4454, Biloxi, MS 39535-4454

MARINE FINANCING
Safeco Credit Co. Inc. 4909 156th Ave. NE, Redmond, WA 98052

MARINE FIRE PROTECTION
Hiller Systems, 3710 Lakeside Court, Mobile, AL 36693
Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807
Unitor Ship Service Inc., 2375 West Esther Street, Long Beach, CA 90813

MARINE FURNITURE
Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807
Jamestown Metal Marine Sales, Inc., 4710 NW Second Ave, Boca Raton, FL 33431
Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031

MARINE GEARS
Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati, OH 45227
The Falk Corp., PO Box 492, Milwaukee, WI 53201-0492
Haley Marine Gears, Inc. P.O. Box 689, Greenville, MS 38702
Marine Gears, P.O. Box 689, Greenville, MI 38701

MARINE HYDRAULICS
Del Gavio Marine, 619 Industrial Rd., Carlstadt, NJ 07072

MARINE INSURANCE
John G. Alden, 1300 SE 17th St., Fort Lauderdale, FL 33316

MARINE INTERIORS
Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807
Jamestown Metal Marine Sales, Inc., 4710 NW Second Ave, Boca Raton, FL 33431
Johnson Construction Specialties, Inc., 3420 Rusk P.O. Box 1360 Houston Texas 77251
Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031

MARINE PUMPS
Gilkes Inc., P.O. Box 628, Seabrook, TX 77586

MARINE SURPLUS SALES
Defense Reutilization & Marketing Service, 2163 Airways Blvd., Memphis, TN 38114

MARITIME ARTWORK
Sarba Art Studio, 6 Ridge Drive, Old Saybrook, CT 06475

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Hwy., Arlington, VA 22202
Donald L. Blount, 2550 Ellsmere Ave., Ste. K, Norfolk, VA 23513
C. Baxter & Associates, P.O. Box 9006, Mobile, AL 36609
CDI Marine Co., 4040 Woodcock Dr., Suite 200, Jacksonville, FL 32207
Childs Engineering Corp., Box 333, Medfield, MA 02052
Grandall Dry Dock Engrs., Inc., P.O. Box 505804, Chelsea, MA 02150
Crane Consultants, 15301 First Ave S., Seattle WA 98148
C.R. Cushing, 18 Vesey St., New York, NY 10007
CT Marine, 56 Crooked Trail, Rowayton, CT 06853
Cunningham & Walker, 1762 Providence Hollow Lane, Jacksonville, FL 32223
Arthur D. Darden, 3200 Ridgelaque Dr., Suite 403, Metairie LA 70002
DeJong & Lebet, Inc., 1734 Emerson Street, Jacksonville, FL 32207
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, 2120 Washington Blvd. Ste.200, Arlington, VA 22204
Elliot Bay Design Group 5301 Shilshole Ave. N.W. Ste. 200, Seattle, WA 98107
Encon Mgmt. & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77708
GHM Inc. (Ind. Measurement Consultants), P.O. Box 1836, Newport News, VA 23601
Gibbs & Cox, Inc., 50 West 23rd St., New York, NY 10010
John W. Gilbert & Assoc., Inc., 199 State St., Boston, MA 02109
The Glosten Assoc. Inc., 600 Mutual Life Bldg., 605 First Ave., Seattle, WA 98104
Guido Perla & Assoc., 720 3rd Ave., Ste. 1200, Seattle, WA 98104
Morris Guralnick Associates, Inc., 130 Sutter St., Ste. 400, San Francisco, CA 94104
C. Raymond Hunt Associates, 69 Long Wharf, Boston MA 02110
Hydrocomp, Inc., 202 C Packets Court, Williamsburg, VA 23185
IMSA 20 Ridgely Ave., Annapolis, MD 21401
J.H. Inc., 3412 Progress Dr., Bensalem, PA 19020
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Kvaerner Masa Marine Inc., 201 Defense Highway, Suite 202, Annapolis, MD 21401
James S. Krogen, 799 Brickell Plaza Ste. 701, Miami, FL 33131
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
MCA Engineers, Inc., 2960 Airway Ave., #A-103, Costa Mesa, CA 92626
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454
John J. McMullen Associates, Inc., 1 World Trade Ctr, Ste 3000, N.Y. NY 10048
Fendall Marbury, P.O. Box 2321, Annapolis, MD 21401
Marine Design & Operations, Inc., 225 E. 1st Ave., Roselle, NJ 07203

Marine Management Systems Inc., 102 Hamilton Ave., Stamford CT 06902
Marine Power Associates, 1010 Turquoise St., Ste 217, San Diego, CA 92109
Maritech, Seacraft, Bay Road, Newmarket, NH 03857
Maritime Design, Inc., 3020 Hartley Rd., Jacksonville, FL 32257
R.J. Mellusi & Co., 71 Hudson St, New York, NY 10013
Nautical Designs, Inc. 2101 S. Andrews Ave, Suite 202, Ft. Lauderdale FL 33316
Ocean Motions Co., P.O. Box 130, 49 Shore Drive, Barrington, RI 02806-0130
Olsen Marine Surveyors Co., P.O. Box 283, Port Jefferson, NY 11777
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 620 Fulson St., Ste. 301, San Francisco, CA 94107
Sargent & Herkes, 225 Baronne St., Suite 1405, New Orleans LA 70112
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029
Sea School, 10812 Gandy Boulevard, St. Petersburg, FL 33702
Seaworthy Systems Inc., P.O. Box 965, Essex, CT 06426; 17 Battery Pl., New York, NY 10004; P.O. Box 975, Barnegat Light, NJ 08006; 2001 N. Beauregard Street, Alexandria, VA 22311; 50 Vashell Way, Orinda, CA 94563
George G. Sharp, Inc., 100 Church St., New York, NY 10007
R.A. Steam, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
A.K. Suda & Ass., 3004 19th St., Metairie, LA 70002-4989
TIMSCO, P.O. Box 91360, Mobile AL 36691

NAVIGATION & COMMUNICATIONS EQUIPMENT
Fununo U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
ICS Electronics Ltd., Unit V, Rutherford Industrial Estate, Ford, Arundel, West Essex, UK
KVH Industries, Inc., 110 Enterprise Center, Middletown, RI 02842-5268
Mackay Communications, 300 Columbus Circle, Edison, NJ 08837
Negron Marine Consultants, 840 Bond Street, Elizabeth, NJ 07201
Offshore Systems Ltd., 107-930 West 1st St., North Vancouver, B.C. V7P 3N4 CANADA
Racal Survey USA, 3824 Westchase, Houston, TX 77042
Scandinavian Micro Systems P.O. Box 155, N-1411, Kolbotn, NORWAY
Scientific Atlanta, Inc., 1650 International Court, Norcross, GA 30093
Sea, Inc., 7030 220th S.W., Mountlake Terrace, WA 98043
Simrad, 19210 33rd Avenue West, Lynnwood, WA 98036
Simrad Robertson, 10801 Hammett, Suite 100, Houston, TX 77043-1923
Sperry Marine Inc., 1070 Seminole Trail, Charlottesville VA 22901
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Trimble Navigation, 585 North Mary Avenue, P.O. Box 3642, Sunnyvale, CA 94086
Waterway Communications System, Inc. 453 E. Park Pl., Jeffersonville, IN 47130

NOISE CONTROL
Soundcoat, One Burt Drive, Deer Park, NY 11729

NOZZLE SYSTEM
Custom Nozzle Fabrication, P.O. Box 547, Pascagoula, MS 39568
Rice Propellers, Av Rios Espinoza #88, Mazatlan, MEXICO 82180

OIL—Marina—Additives—TESTING
Lubriport Laboratories, Inc., 1650 Airline Hwy, Kenner, LA 70062
Mobil Oil Corporation, 3225 Gallows Road, Fairfax, VA 22037-0001

OIL/WATER SEPARATORS
Alfa-Laval Separation, Inc., 955 Meams Rd., Warminster, PA 18974-0556
Blohm & Voss Industrie GmbH, P.O. Box 10 07 20, D-20457 Hamburg 1, GERMANY
U.S.A. Reps: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168
Fast Systems, 3240 North Broadway, St. Louis, MO 63147
Hamworthy Marine Inc., 1129 Hospital Dr. Ste 3C, Stockbridge, GA 30281
MMC International, 60 Inip Dr., Inwood NY 11696
National Fluid Separators, 827 Hanley Industrial Ct., St. Louis, MO 63144
Nelson Industries, Highway 51 West, Stoughton, WI 53589

PAINT—COATING—CORROSION CONTROL
Ashland Chemical Co., Drew Marine Co., One Drew Plaza, Boonton, NJ 07005
Corroseal, Inc., 1045 12th Ave. NW-FSA, Issaquah, WA 98027
Devco Coatings 4000 Dupont Circle, Louisville, KY 40207
Esgard, Inc., P.O. Drawer 2698, Lafayette, LA 70502
Ferro Corp., 1301 North Flora St., Plymouth, IN 46563
Jamestown Distrib., 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835
Hempel Coatings, 6901 Cavalcade St., Houston, TX 77028
Microphor, Inc., Marine Div., 452 E. Hill Rd., P.O. Box 1460, Willits, CA 95490
Permapost Rust, 264 South Main St., Wallingford, CT 06492
Product Research Service, Inc. 229 Hwy 23, PO Box 159, Belle Chasse, LA 70037
Royal Chemical, 2705 Concord Road, Belle Chasse, LA 70037
Sigma Coatings, 8979 Market St., Houston, TX 77029, 330 Rover Rd., Harvey, LA 70059, 1100 Adams St., Hoboken, NJ 07030
Unitor Ship Services Inc., 2375 West Esther Street, Long Beach, CA 90813

PIPE FITTINGS/CUTTING/CONNECTING SYSTEMS
George Fischer Pipe Tools, 407 Hatley St., Box 40, Holly, MI 48442
Lokring Corp., 396 Hatch Drive, Foster City, CA 94404

PLASTICS
American Industrial Plastics, 724 Ferritus Blvd., Daytona Beach, FL 32114

POLLUTION CONTROL/PRODUCTS/MARINE SERVICES
Marco Pollution, 2300 West Commodore Way, Seattle, WA 98199
Oil Mop, Inc., 221 Rue De Jean, Lafayette, LA 70508

PREDICTIVE MAINTENANCE
Predict/DLI, 253 Winslow Way West, Bainbridge Island, WA 98110

PROPELLERS
Associated Marine Technologies, 4016 Seaboard St., Portsmouth, VA 23701
Holland Roer Propeller, 2273 Barataria Blvd., New Orleans, LA 70072
Rice Propellers, Av. Rios Espinoza #88, Mazatlan, MEXICO 82180
Rolla SP Propellers SA, Via Silva 5 - P.O. Box 251 - 6828 Balerna - SWITZERLAND
Rolla SP Propellers USA Inc., 4030 Mustang Road, Melbourne, FL 32934 USA
Sound Propeller, 1608 Fairview Avenue E., Seattle, WA 98102

PROPULSION EQUIPMENT
—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
Avondale Industries, Harvey Quick Repair, P.O. Box 116, Harvey, LA 70058
American Air Filter, P.O. Box 35690, Louisville, KY 40432
ABB Drives Inc., P.O. Box 372, Milwaukee, WI 53201-0372, USA
ABB Industry Oy, P.O. Box 185, 00381 Helsinki, FINLAND
ABB TURBOCHARGER, INC., 1460 Livingston Avenue, N. Brunswick, NJ 08902
Aquamaster-Rauma Ltd., Box 220, SF-26101, Rauma, FINLAND
Aquamaster-Rauma Inc., 2315 North Woodlawn Ave., Ste. 103, Metairie, LA 70001
Bird Johnson Company, P.O. Box 1528, Pascagoula, MS 39567
Brunvoll A/S, P.O. Box 370, N-6401, Molde, Norway
Caterpillar, 100 NE Adams Street, Peoria, IL 61629-2320
Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati, OH 45227
The Falk Corp., PO Box 492, Milwaukee, WI 53201-0492
Fincantieri, Diesel Engines Div.—GMT, Bagnoli della Rosandra 334, Trieste, ITALY
GE Naval & Drive Turbine Systems, 166 Boulder Dr., Fitchburg MA 01420
GEC ALSTHOM Diesels Inc., 10801 Kempwood Dr. Ste 1, Houston, TX 77043-1412
Goltens Worldwide, 160 VanBrunt St., Brooklyn, NY 11231
Holset Engineering, Inc., 1320 Kemper Meadow, Ste. 500, Cincinnati, OH 45240
In-Place Machining Co., Inc. 1929 North Buffum Street, Milwaukee, WI 53212-3793
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Krupp Mak, 7555 Danbro Crescent, Mississauga, Ontario, CANADA L5N 6P9
LIPS B.V., P.O. Box 6, 5151 RP Drunen, The Netherlands
Lohmann & Stolterfoht, P.O. Box 1860, D-58408 Witten, Germany
Lo-Rez Vibration Control, 186 West 8th Ave., Vancouver BC CANADA, V5Y 1N2
Mapeco Products Inc., 90 Forest Ave., Locust Valley, N.Y. 11560
Markisches Werk, P.O. Box 1442, D-5984 Halver GERMANY
MAN B&W Diesel, 17 State St., New York, NY 10004
MAN B&W Diesel A/S, Ostervej 2, DK-4960 Høleby, DENMARK
MAN B&W Diesel A/S, Alpha Diesel, Niels Juels Vej 15, DK-9900
Frederikshavn, DENMARK
MAN B&W Diesel GmbH, Stadtbachstrasse 1, D-86153 Augsburg 1 GERMANY
Omnitruster, Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
Onon corp., 1111 Cedar Creek Rd., Gratiot, WI 53024
Philadelphia Gear 181 South Gull Rd., King of Prussia, PA 19406
Rolla SP Propellers SA, Via Silva 5, P.O. Box 251, 6828 Balerna SWITZERLAND
Rolla SP Propellers USA, 4030 Mustang Road, Melbourne, FL 32934, USA
S & S Propeller Co., 27-18 College Point Blvd., Flushing, NY 11354
Karl Senner Inc., 25 W Third, Kenner LA 70082
Schottel-Werft, Manizer Strasse 99, D-56322 Spay/Rhein, GERMANY
Schottel North America, Inc., 1505 Corbin Ave., Hammond, LA 70403
Ships Machinery International, Inc., 8375 N.W. 56 Street, Miami, FL 33166
Siemens Electric Ltd., 1180 Courtney Park Rd., Mississauga, ONTARIO
Stewart & Stevenson, 1400 Destrehan, P.O. Box 8, Harvey LA 70059-0008
Thrustmaster of Texas, P.O. Box 840189-12227 IFM 529, Houston, TX 77284-0189
Ulstein Bergen Diesel A/S, P.O. Box 924, N-5002, Bergen, NORWAY
GERMANY U.S. Rep: Voith Schneider America Inc., 121 Susquehanna Ave., Great Neck, NY 11021
Oy Wartsila Ab, Vasa and Abo Divisions, P.O. Box 244, SF6150 Vasa, FINLAND

PUMP—Repair—Drives
Ameco Pumps, 4000 West Burnham St., Milwaukee, WI 53215
Del Gavio, 619 Industrial Rd., Carlstadt, NJ 07072
Gilkes, Inc., PO Box 628, Seabrook, TX 77586
Hamworthy Marine, Inc., 1129 Hospital Dr. Ste 3C, Stockbridge, GA 30281

Jerry B. Leach Co., Box 71, 647 State Rd., Cheraw, SC 29520
Vita Motivator, 566 Parker St., Newark, NJ 07104

RADIOS —Portable
World Trade Network, Ltd., 16920 28th Ave. N., Minneapolis, MN 55447

REFRIGERATION EQUIPMENT/SERVICES
Adrick Manne, 141D, Central Ave., Farmingdale, NY 11735
Ashland Chemical Co., Drew Marine Co., One Drew Plaza, Boonton, NJ 07005
RTF Mfg., RD #1 Route 66, Hudson, NY 12534
Unitor Ship Service Inc., 2375 West Esther Street, Long Beach, CA 90813

REMOTE VALVE OPERATORS
American United Marine Corp., 5 Broadway, Rt 1, Saugus, MA 01906
Elliott Manufacturing, P.O. Box 773, Binghamton, NY 13902

RIGID INFLATABLE BOATS
American Eagle, 780 E. Pearle Jensen Way, LaConner, WA 98257
Willard Marine, Inc. 1250 N. Grove St., Anaheim, CA 92806
Zodiac of N. America Thompson Creek, P.O. Box 400, Stevesville, MD 21666

ROPE—Manila—Nylon—Hawser—Fibers
Allied Signal Inc., Fibers Division, 101 Columbia Rd, Morristown, NJ 07962
American Mfg. Co., 200 Southpark Rd., Lafayette, LA 70508-3609
Bayer AG, D-41538, Dormagen, GERMANY
Puget Sound Rope, 1012 Second St., Anacortes, WA 98221

RUDDER BUSHES
Vesco Plastics, P.O. Box 40647, Cleveland 2022, South Africa

SAFETY LIGHTING
Datrex, Inc., P.O. Box 1150, Kinder, LA 70648-1150

SALVAGE/SPILL RESPONSE
Donion Marine, 1250 Liberty Ave., Hillside, NJ 07205

SANITATION DEVICE—Pollution Control
Byrne, Rice & Turner, Inc., 1172 Camp Street, New Orleans, LA 70130
Eltech International Corp., 1110 Industrial Blvd., Sugarland, TX 77478
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
Fast Systems, 3240 North Broadway, St. Louis, MO 63147
ITT Jabsco, 1485 Dale Way, Costa Mesa, CA 92626
Jered Brown Brothers, Inc., 1608 Newcastle St., Brunswick, GA 31521-0904
Research Products Blankenship, 2639 Andjon Dallas, TX 75220

SATELLITE COMMUNICATIONS
American Mobile Satellite Corp., 10802 Parkridge Blvd., Reston, VA 22091
CP Comm. Intl., 2100 Park Central North, Ste. 900, Pompano Beach, FL 33064
IDB Mobile Comm., 6903 Rockledge Dr., Ste. 500, West Bethesda, MD 20817
Mackay Communications, 2721 Discovery Dr., Raleigh, N.C. 27604-1851
Maritime Cellular Network, 560 Village Blvd., W. Palm Beach, FL 33409
Norwegian Telecom, Postboks 6701 St. Olavs Plass, N-0130, Oslo, Norway
PTT Telecom, Station 12, P.O. Box 30150-2500 JD The Hague, NETHERLANDS
Scientific Atlanta, Inc., 1650 International Court, Norcross, GA 30093
Singapore Telecom, 15 Hill Street, Telephone House, 2nd Storey, Singapore 0617
Telstra Mobile Satellite & Radio Services, 79 St. Hilliers Rd., Auburn NSW 2144, AUSTRALIA

SCALE MODELS
Markitex, PO Box 225, Oconomowoc, WI 53066
Scale Reproductions, 16346 County Road 13, Fairhope, AL 36532
Sturgeon Bay Model Shop, 187 N Ninth Ave., Sturgeon Bay WI 54235

SEALS
Blohm & Voss Industrie GmbH, P.O. Box 10 07 20, D-20457 Hamburg, GERMANY
U.S.A. Reps: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168
Kobelco Marine Engineering Co., 6F Tatsunuma Bldg., 3-19, Yaesu 1-chome, Chuo-ku, Tokyo, 105 JAPAN
U.S.A. Rep. Roland Marine Inc., 90 Broad Street, New York, NY 10004
John Crane Marine, 1536 Barclay Blvd., Buffalo Grove, IL 60089

SEALANTS
Boatite, Inc., Div. of Life Ind., 205 Sweet Hollow Rd., Old Bethpage, NY 11804

SEATING
H.O. Bostrom Co., 818 Progress Ave., Waukesha, WI 53186
Stidd Systems, Inc., 220 Carpenter St., Greenport, NY 11944
Tumbull, Inc., 3818 134th St. NE, Marysville, WA 98271

SELF UNLOADING SYSTEM REPAIR
Klehma Rubber Engineering, GERMANY
U.S. Rep: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168

SHIP CERTIFICATION
American Bureau of Shipping, 2 World Trade Center, 106th Fl., New York, NY 10048

SHIP EQUIPMENT
Jered Brown Brothers Inc., 1608 Newcastle St., Brunswick, GA 31521-0904
Metric Systems Corp., 645 Anchors St., Ft. Walton Beach, FL 32548

SHIP REPAIR
Curacao Drydock Co., P.O. Box 3012, Curacao, Netherlands Antilles
Goltens Worldwide, 160 Van Brunt St., Brooklyn, NY 11231

SHIP VALUATION
Capt. E.S. Geary, P.O. Box 1246, Fajardo, Puerto Rico 00738

SHIPBUILDING—Repairs, Maintenance, Drydocking
American Eagle Mfg., 780 Pearle Jensen Way, La Conner WA 98257
Amfels, Inc., P.O. Box 3107, Brownsville, TX 77823
Astilleros Espanoles, S.A. Ochandiano, 14-18 28023 El Plantio SPAIN
Atlantic Marine, Inc., P.O. Box 3202, Mobile, AL 36652
Atlantic Marine, Inc., 8500 Heckscher Dr., Jacksonville, FL 32226
Avondale Industries Inc., P.O. Box 50280, New Orleans LA 70150
Bender Shipbuilding & Repair, P.O. Box 42, Mobile AL 36601
Bisso Marine Co., P.O. Box 4113, New Orleans, LA 70178
Bollinger Lockport & Larose, P.O. Box 250, Lockport, LA 70374-0250
Caridoc, P.O. Box 1147 Port Of Spain, Trinidad, W.I.
Chris-Marine AB, P.O. Box 9025, S-2000 39, Malmö, SWEDEN
Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381
Fincantieri SpA Cantieri Navali Italiani, Via Cipro 11, 16129 Genoa ITALY
Goltens Worldwide, 160 Van Brunt St., Brooklyn, NY 11231
Gulf Coast Fabrication, Inc., P.O. Box 539, Lakeshore, MS 39558
HDW, Kiel, Germany, USA Rep.; Roland Marine Inc., 90 Broad St., NY, NY 10004
Hitachi Zosen, Hitachi Shipbuilding & Engineering Co., 1-1-1 Hitotsubashi Chiyoda-Ku Tokyo 100 Japan
Intermarine (USA), Inc., 301 N. Lathrop Ave., Savannah, GA 31402
In-Place Machining Co., Inc. 929 North Buffum Street, Milwaukee, WI 53212-3793
Jacksonville, Shipyards, 750 E. Bay St., Jacksonville, FL 32202
Jelboat, Inc., P.O. Box 610, Jeffersonville IN 47130
Kvaerner Masa-Yards Oy, Box 132, SF-00151, Helsinki, FINLAND
Leevac Shipyards, P.O. Box 1190, HWY 90 East, Jennings, LA 70546
Lindenau GmbH, Skagerrakufer 10, Postfach 9093 D-2300 Kiel, Friedrichsort GERMANY
Marco Pollution Control, 2300 West Commodore Way, Seattle, WA 98199
McDermott Shipbuilding, Inc., 160 James Dr. East, St. Rose, LA 70087
Motor-Service AB, Box 2115, 144 04 Ronning, SWEDEN
Munson Hammerhead, 780 Pearle Jensen Way, La Conner WA 98257
NEI Synchronfill, Inc., 8970 S W 87th Ct., Miami FL 33176
Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607
Peterson Builders, Inc., 101 Pennsylvania Ave., Sturgeon Bay, WI 54235-0650
Thomas Marine, 37 Bransford Street, Patchogue, NY 11772
Samsung Heavy Ind., 25, 1-ka, Bongrae-dong, Chung-ku, Seoul, Korea
SeaArk, P.O. Box 210, Monticello AR 71655
SeaFab, P.O. Box 1651, 4111 Cedar St. Pascagoula, MS 39567
Service Marine Industries, P.O. Box 3606, Morgan City LA 70381
Skipperliner Shipyards, 621 Park Plaza Dr. Dept 21, LaCrosse WI 54601
Steiner Shipyard, Inc., P.O. Box 742, Bayou la Batre, AL 36509
Swath Ocean, 979 G Street, Chula Vista, CA 92011
Trinity Marine Group, Box 3029, Gulfport, MS 39505-3029
Via Nova Engineering Solutions, Via E. Toli, 20, 34074 Montalcone ITALY
Westport Shipyard, P.O. Box 308, Westport, WA 98599
Willard Marine, Inc., 1250 N. Grove St., Anaheim, CA 92806
Zodiac of North America Inc., Thompson Creek Rd., P.O. Box 400, Stevensville, MD21666

SHIPYARD / CABLES
Amereable, 350 Bailey Road, El Dorado, AR
T.A.S.T. Corp. PO Box 10392, Fairfield, NJ 07004

SILENCERS
Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130
Nelson Division, Exhaust & Filtration Systems, Hwy. 51 West, P.O. Box 428, Stoughton, WI 53589

STAIRMASTER SAFETY TREADS
Wooster Products, Inc., 1000 Spruce Street, P.O. Box 896, Wooster, OH 44691-6005

STEERING GEARS/STEERING SYSTEMS
Cunningham Marine Hydraulics Co., 201 Harrison St., Hoboken, NJ 07030
Jastram Engineering, 485 Mountain Hwy N., North Vancouver, B.C. CANADA V7J 2L3

STERN TUBE BEARINGS
Kobelco Marine Engineering Co., 6F Tatsunuma Bldg., 3-19 Yaesu 1-Chome, Chuo-ku, Tokyo 103, JAPAN
U.S.A. Rep: Roland Marine Inc., 90 Broad Street, New York, NY 10004

STERN TUBE BUSHES
Kobelco Marine Engineering Co., 6F Tatsunuma Bldg., 3-19 Yaesu 1-Chome, Chuo-ku,

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Owner/ Operator	Country (Owner)	Shipyard	Country (Shipyard)	Ship Type	No.	Delivery Date	Price \$M
HYUNDAI M. M.	KOREA	HYUNDAI	KOREA	CONTAINER	5	1997	175
HYUNDAI M. M.	KOREA	HYUNDAI	KOREA	CONTAINER	9	—	—
ISLAMAR	CYPRUS	HYUNDAI	KOREA	CONTAINER	1	7/98	35
MISC	MALAYSIA	MALAYSIA SHIPYARD	MALAYSIA	CONTAINER	2	1998	40
N.Y.K.	JAPAN	IMABARI	JAPAN	CONTAINER	3	1998	—
NVE	GERMANY	HYUNDAI	KOREA	CONTAINER	2	97/98	98
NVE	GERMANY	HYUNDAI	KOREA	CONTAINER	2	97/98	80
SCHOELLER HOLDINGS	GERMANY	WEIHEI	CHINA	CONTAINER	4	97/98	—
SHREYAS SHIPPING	INDIA	ABG SHIPYARD	INDIA	CONTAINER	1	8/98	15.3
TECMARINE LINES	U.S.	J. PATTJE	NETHERLANDS	CONTAINER	3	97/98	—
UNKNOWN	HONG KONG	JIANGMEN	—	CONTAINER	2	1997	—
UNKNOWN	GERMANY	H PETERS	GERMANY	CONTAINER	1	1997	—
UNKNOWN	GERMANY	DAEWOO	KOREA	CONTAINER	2	1998	—
UNKNOWN	GERMANY	DAEWOO	KOREA	CONTAINER	2	1997	—
UNKNOWN	—	SEDEF GEMI	TURKEY	CONTAINER	2	1998	26
GRIFFIN SHIPPING HOLDINGS	SOUTH AFRICA	STOCZNIA	POLAND	CONTAINER	1	1998	31
SOUTH COAST SHIPPING	U.K.	MERWEDE SHIPYARD	NETHERLANDS	DREDGER	1	6/98	—
CAMEROON REPUBLIC	CAMEROON	NEW GERMERSHEIM	—	DREDGER	1	1997	—
SMEDVIG DRILLING	NORWAY	STERKODER KRISTIANSDUND	NORWAY	DRILLSHIP	1	1998	117.8
HIGASHI NIHON FERRY	JAPAN	MITSUBISHI H.I.	JAPAN	FERRY	1	5/97	27.8
VISENTINI/NORTH SEA FERRIES	ITALY	C.N. VISENTINI	ITALY	FERRY	2	1998	—
BART SWITYNK	—	SCHEEPSWERF PETERS	NETHERLANDS	GENERAL CARGO	1	1998	—
FRANZ SWITYNK	—	SCHEEPSWERF PETERS	NETHERLANDS	GENERAL CARGO	1	1998	—
GEERT SWITYNK	—	SCHEEPSWERF PETERS	NETHERLANDS	GENERAL CARGO	1	1998	—
UNKNOWN	GERMANY	H. PETERS	GERMANY	GENERAL CARGO	1	1996	—
CARBOFIN	ITALY	SESTRI CANTIERE NAVALE	ITALY	LPG	1	12/98	—
ECOMAR SCHIFFAHRTS	GERMANY	OLTENIZA SHIPYARD	ROMANIA	MULTI-PURPOSE	1	1997	—
UNKNOWN	GERMANY	OLTENIZA SHIPYARD	ROMANIA	MULTI-PURPOSE	1	1996	—
OLDENDORFF	GERMANY	WUHU	CHINA	OPEN-HATCH BOX-SHAPED	2	97/98	31
IDO	TURKEY	KVAERNER FJELLSTRAND	NORWAY	PASSENGER	6	1997	26
DSB REDERI	DENMARK	FINNYARDS	FINLAND	PASSENGER/FERRY	1	1997	45.4
MASHANTUCKET PEQUOT	U.S.	PEQUOT RIVER SHIPWORKS	U.S.	PASSENGER/FERRY	1	1997	—
DONG YANG EXPRESS	KOREA	DAEWOO	KOREA	PASSENGER/RoRo	1	1997	—
FYLKESBAATANE I SOGN OG FJORDANE	NORWAY	FISKERSTRAND VERFT	NORWAY	PASSENGER/RoRo	1	6/97	—
SCANDLINES (DSB REDERI/SWEFERRY)	DENMARK/SWEDEN	FINNYARDS	FINLAND	PASSENGER/RoRo	1	8/97	42.3
STAR REEFERS	NORWAY	SHIKOKU DOCKYARD	JAPAN	REEFER	2	1998	60
GOVERNMENT OF JAPAN	JAPAN	NKK CORP.	JAPAN	RESEARCH	1	5/98	—
KAWASAKI KISEN KAISA (K-LINE)	JAPAN	IMABARI	JAPAN	RoRo	1	6/97	—
MAERSK SUPPLY	DENMARK	SIMEK	NORWAY	SUPPLY	2	97/98	66.6
EURONAV	FRANCE	HYUNDAI	KOREA	TANKER	1	1997	52
KLAUS OLDENDORFF	CYPRUS	HALLA	KOREA	TANKER	1	1998	45
LUKOIL-ARCTIC-TANKER	RUSSIA	MTW	GERMANY	TANKER	2	—	85.7
UNKNOWN	—	HIGAKI ZOSEN	JAPAN	TANKER	1	1996	—
BALT-TANKER LTD.	RUSSIA	ALABAMA SHIPYARD	U.S.	TANKER	5	98/99	125
DAITOH TRADING CO.	JAPAN	ASAKAWA	JAPAN	TANKER	2	96/97	35.2
DAITOH TRADING CO.	JAPAN	FUKUOKA	JAPAN	TANKER	1	3/97	19.4
F. AHRENKIEL	GERMANY	VIANA DO CASTELO	PORTUGAL	TANKER	1	1997	—
HOLLMING OY	FINLAND	FINNYARDS	FINLAND	TANKER	2	97/98	63.7
METALNAVE COMERCIO E INDUSTRIA	BRAZIL	METALNAVE	BRAZIL	TANKER	1	1998	—
STOLT NIELSEN	NORWAY	JULIANA C.G.	SPAIN	TANKER	1	1998	48
SNAPS	NORWAY	FUKUOKA	JAPAN	TANKER	4	97/98	77.6
UNITED TANKERS	SWEDEN	VULCANO	SPAIN	TANKER	1	1997	—
LUKOIL TANKERS	RUSSIA	ADMIRALTEISKI ST PETERSBURG	RUSSIA	TANKER	5	98/99	140
MURMANSK SHIPPING	RUSSIA	MTW	GERMANY	TANKER	2	1997	85.7
AMERICAN TRACTOR TUG INC.	U.S.	LEEVAAC SHIPYARDS	U.S.	TUG	1	—	—
SCINICARIELLO AUGUSTEA	ITALY	SUMITOMO	JAPAN	TUG	2	1997	12.9
MOKSTER SHIPPING	NORWAY	AUKRA INDUSTRIER	NORWAY	TUG	1	4/97	26
DEBLIN PORT AUTHORITY	IRELAND	ZAMAONA	SPAIN	TUG	1	1/97	—
MARINE STEEL LTD.	AUSTRALIA	WESTGATE PORT TARANAKI	—	TUG	1	—	—
mitsui O.S.K. LINES (MOL)	JAPAN	MINAMI NIPPON	JAPAN	VEHICLE CARRIER	1	1998	—
MOBIL CORPORATION	U.S.	SUMITOMO	JAPAN	VLCC	2	98/99	180

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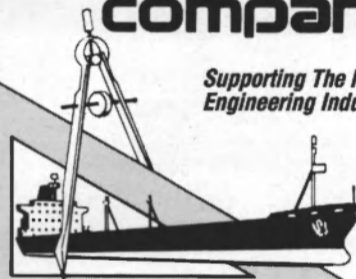
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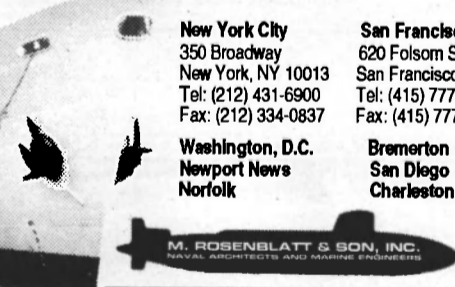
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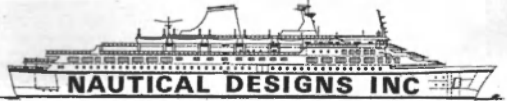
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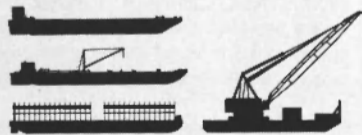
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