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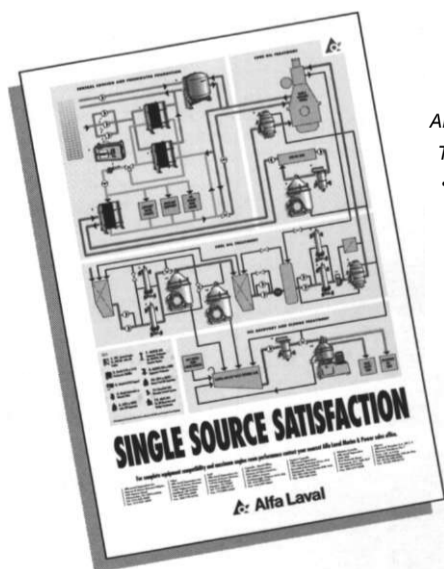


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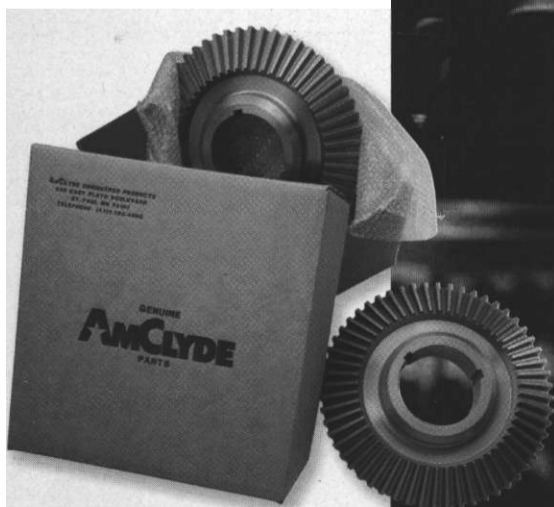
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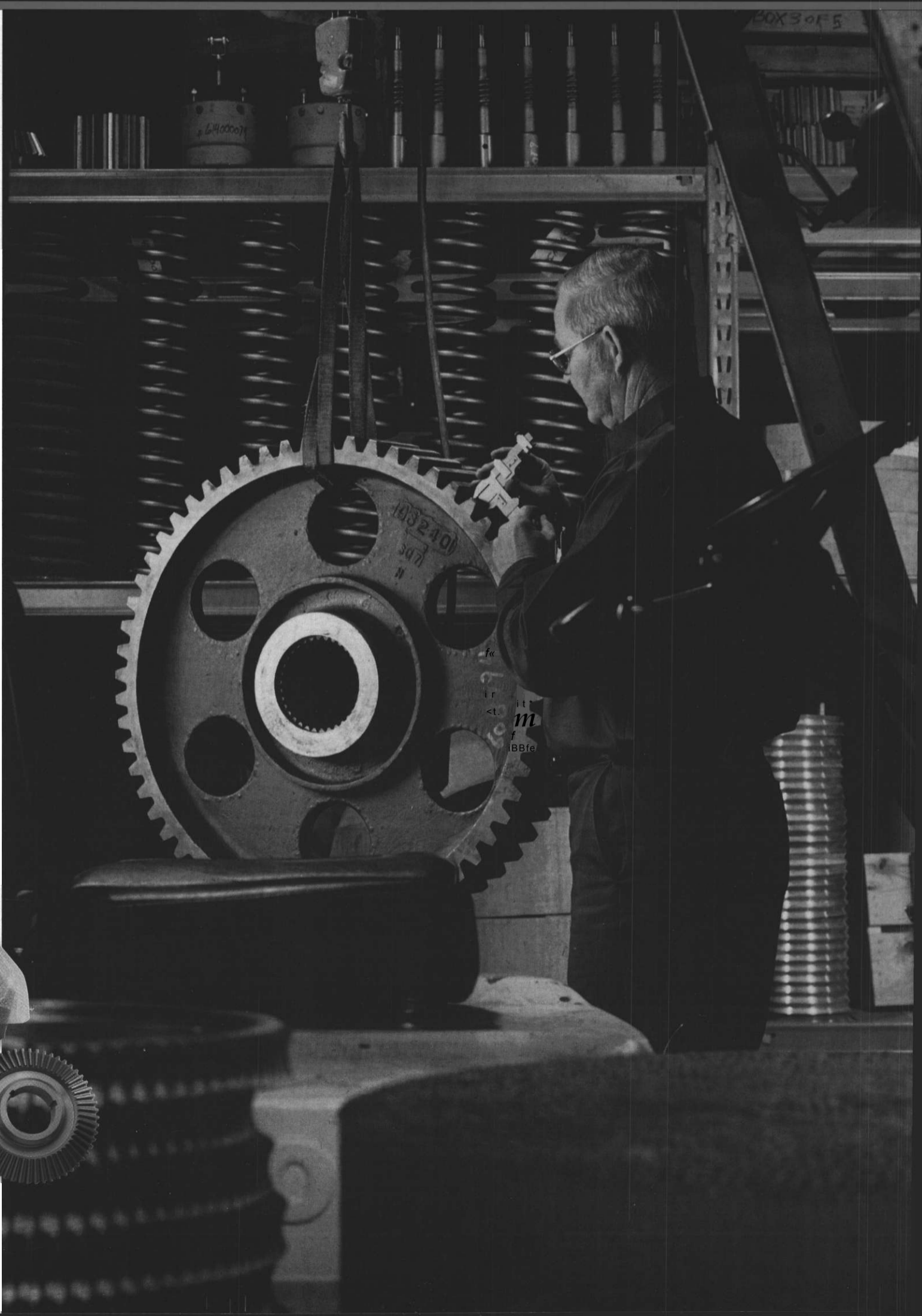
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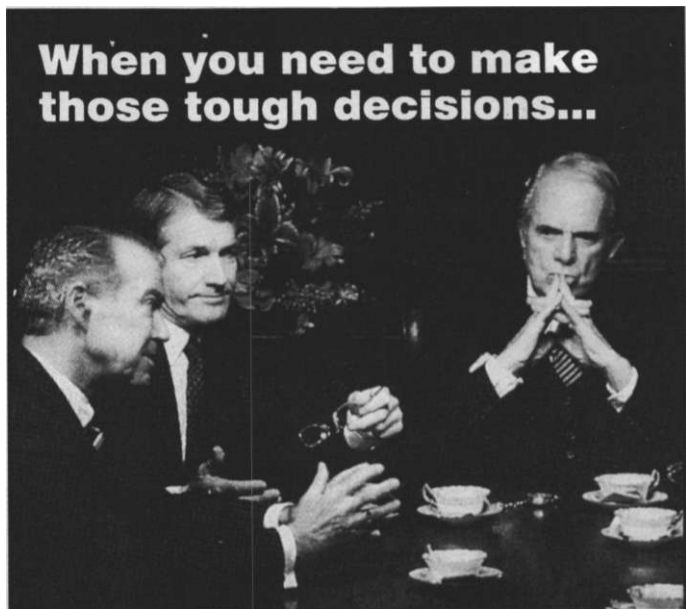
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ON THE COVER

Hamburg, Germany once again hosts the Shipbuilding, Machinery & Marine Technology exhibition, more commonly known as SMM '94. Pictured on the cover is the sailing ship Gorch Fock in Hamburg Harbor. Maritime Reporter's coverage of SMM '94 starts on page 25, and includes an editorial from VSM's Ulrike Nieter; an overview of the German Maritime Industry, German shipyard updates, and a preview of select company's plans for the exhibition. (Photo credit: German National Tourist Office, New York.)

Safety Designs For The 21st Century

The RNLI's new Severn & Trent class rescue craft incorporate the latest in design and equipment.



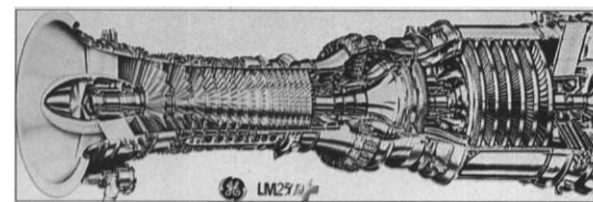
German Maritime Industry

An exclusive look inside the German Marine Industry, with a sneak preview of what's waiting for the industry at the Hamburg Show.



MARINE PROPULSION TECHNOLOGY

Propulsion equipment manufacturers wage a constant battle to improve performance and stay ahead of ever-tightening environmental constraints. Read up on the manufacturers which keep the maritime industry on the move.



PLUS: Propulsion Directory

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Avondale Delivers **Boomtown Bollo**



The Boat Division of Avondale Industries, New Orleans, La., delivered the *Boomtown Belle*, ahead of schedule, to Boomtown Westbank.

The 250-ft. by 72-ft. (76-m by 22-m) 19th Century-style riverboat gaming vessel will operate in Harvey, La.

The *Boomtown Belle* has approximately 30,000-sq.-ft. of public area on casino decks and has 1,211 gaming positions, utilizing 849 slots and 362 table positions. Avondale's in-house engineering staff designed the vessel. Directions in Design (DID) of St. Louis, Mo. designed the interiors.

The *Boomtown Belle* employs a combination of both propellers and paddlewheel for propulsion.

Avondale Boat Division will deliver its second gaming vessel this year.

For more information on Avondale
Circle 133 on Reader Service Card

Boomtown Bollo Equipment List

Main engines.....	Caterpillar
Gensets.....	Caterpillar
Propellers.....	Michigan Wheel
Gears.....	Reintjes
Bowthruster.....	Schottel
Sternthruster.....	Schottel

OMI, Astilleros Espanoles Sign Letter Of Intent For Two Tankers

OMI Corp. has entered into a letter of intent with Astilleros Espanoles, S.A. of Madrid, Spain, for the construction for OMI of two chemical/product tankers of approximately 45,000-dwt. The vessels are to be delivered in mid-1996.

For more information on
Astilleros Espanoles
Circle 127 on Reader Service Card

Sobrena To Convert Accommodation Platform For Rasmussen Group

Sobrena, the Brest-based shiprepairer, has won its largest contract ever from the Rasmussen Group of Kristiansand, Norway for the conversion of the accommodation platform Polycastle.

The platform is scheduled to arrive at Brest at the beginning of November and the contract will take until March 1995 to complete.

Polycastle will be converted to a dynamically-positioned accommodation platform for operation in accordance with Norwegian Maritime Directorate Class 3. In addition, the electrical power is to be increased, two additional thrusters will be added and sponsons will be installed.

Port Of Portland To Expand Terminal 6



Portland's container rate growth has reportedly been the fastest among West Coast seaports for three years running.

The Port of Portland Commission approved a program that calls for expansion of the Port's Terminal 6 container complex which will handle an ultimate volume of 300,000 containers (510,000 TEUs).

To reach the full capacity of 300,000 containers per year, the port will need to invest about \$60 million in capital improvements over the next 10 years. This investment will extend the three-berth wharf at Terminal 6 for larger ships, add container cranes and expand the terminal area by 77 acres. As a first phase, staff has recommended a \$25 million construction program to be accomplished in the next three years to meet current and near future capacity requirements, regardless of the specific rate of growth.

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Harbor Tug & Barge Purchases Tug For San Diego Operation



Harbor Tug & Barge purchased the tug *Feather River*, a newly upgraded vessel which will service coastwise in California. The vessel is constructed of steel and is a pusher-style tug with twin screw, four flanking rudders and a stern towing winch. *Feather River* is propelled by twin Caterpillar engines and a Kort nozzle. Rated horsepower is 1,250. *Feather River* will be used in barge moves, dead ship moves and short offshore coastal tows.

McDermott, Stolt Comex Consider Combining Subsea Operations

Stolt Comex Seaway S.A. and McDermott

International Inc. have been holding discussions concerning the possible combination of McDermott's subsea operations and those of Stolt Comex.

Permea Maritime Finishing Membrane Nitrogen Generator For Offshore

Permea Maritime Protection, a division of Air Products A/S in Norway, put the finishing touches to what is reportedly the world's largest membrane nitrogen generation package for offshore use. The package is being built for Hamilton Oil Co. Ltd. for the Liverpool Bay Development, and is destined for installation on the Douglas Accommodation Platform. The capacity is 2233 NM³/hr (2 million SCFD) of nitrogen with a purity of 95 percent.

The Douglas package consists of a PRISM® Membrane Nitrogen System with two feed air compressors and a nitrogen receiver. The package will be supplied as two skids, of which one will house two 20-ft. containers with the compressors and the other the PRISM system and the receiver.

The bulk of the nitrogen will be used for stripping of hydrogen sulphide from produced oil/water at the Douglas process platform. The nitrogen will also be used for inert purging and blanketing of tanks and piping systems, which is safer than inerting with methane. Additionally,

the nitrogen will be used for purging dry seals on compressors and as back-up gas for purging the flare stack. PRISM systems generate nitrogen gas from air by means of PRISM Alpha membrane gas separators. The systems typically include feed air filters, feed air heater, PRISM Alpha separators, piping, instrumentation and controls for automatic unattended operation. About 140 systems have been ordered for ship-board use.

For more information on Permea Maritime
Circle 117 on Reader Service Card

Service Marine Industries Delivers Royal Queen, Passenger/Dinner Vessel

Service Marine Industries, Inc. of Morgan City, La. delivered the *Royal Queen*, a 103-ft. (31-m), 400 passenger capacity dinner cruise vessel to Winner Boat Tours of Wilmington, N.C.



The vessel is powered by two Cummins diesel engines, each rated at 300 hp, driving fixed pitch propellers. Electrical power is provided by two 75 kW John Deere marine generators, set up for parallel operation. A McElroy electric vertical capstan is provided to raise and lower the anchor. The vessel is air conditioned with a 50-ton Carrier central air conditioning system provided by Marine Air Systems, Inc.

For more information on Service Marine
Circle 122 on Reader Service Card

ICOM Names Spencer Regional Sales Manager, Marine Division

Ron Spencer was named regional sales manager, Marine Division, for ICOM America, Inc. Mr. Spencer is responsible for managing Icom's marine dealer network for the West Coast, from Alaska to Mexico. He coordinates sales training, advertising, merchandising, trade shows and overall product promotion for Icom's marine communications and navigational equipment.

BethShip To Drydock 11 Vessels

BethShip Sparrows Point Yard received contracts for 11 drydockings including two tankers, two container/reefer vessels and seven cruise vessels.

For more information on BethShip
Circle 125 on Reader Service Card

The drydocking specifics are as follows:

Owner/Manager	Vessel Name	Arrival
Texaco	<i>Star Georgia</i>	August 29
Texaco	<i>Star Rhode Island</i>	Early November
Blue Star Ship Mgt.	<i>Melbourne Star</i>	August 28
Blue Star Ship Mgt.	<i>America Star</i>	Mid September
Royal Caribbean Cruises, Ltd.	<i>Monarch of the Seas</i>	September 7
Royal Caribbean Cruises, Ltd.	<i>Song of America</i>	November 1
Carnival Cruise Lines	<i>Fantasy</i>	October 4
Carnival Cruise Lines	<i>Sensation</i>	October 18
Dolphin Cruise Line	<i>Sea Breeze I</i>	December 6
Holland America Line	<i>Maasdam</i>	December 14
Holland America Line	<i>Statendam</i>	December 17

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NKK To Build Second LNG Carrier

NKK received an order from a joint venture formed by NYK Line and Malaysia's Perbadanan Nasional Shipping Line Berhad (PNSL) for another 18,800-sq.-m. LNG carrier. As with the first carrier, this vessel will transport LNG from Malaysia's Sarawak gas fields to a Japanese city gas utility.

The ship will be built at NKK's Tsu Works, with delivery scheduled for May 1997. As with the first ship, it will use the Technigaz Mark III membrane cargo containment system with three stainless steel tanks built in its hold.

For more information on NKK
Circle 89 on Reader Service Card

Sundial Marine Repowers Tidewater Towboat *Sundial*

Tidewater Barge Lines of Vancouver, Wash., in an effort to match modern equipment to service requirements on the Columbia/Snake River waterway system, unveiled its repowered and improved tug *Sundial*.

Sundial Marine Construction and Repair performed the entire job, including installing two new Wartsila Vasa 8R22 engines and rebuilding the Falk reduction gears, as well as installing new clutches,

cooling systems, fuel meters, exhaust silencers, alarm systems and engine heaters. The total renovation took three months and cost \$1.3 million.

The *Sundial*, put into service 11 years ago, is one of seven tugs on the Tidewater equipment roster with more than 3,000 hp.

After much research, Tidewater Barge Lines, which operates 16 tugs and 125 barges, selected Wartsila engines.

For more information on Wartsila
Circle 86 on Reader Service Card

Dockwise Launches Daewoo SHW Jacket Via Self-Propelled Lift Vessel

The *Mighty Servant 2*, one of the 15 heavy lift vessels in Dockwise's fleet, recently loaded, transported and launched the 3,400-ton Daewoo SHW jacket off of Bombay. An additional load of 2,000 tons of piles has been loaded and stowed on the same vessel. Daewoo is the first client to support Dockwise for the project. Prior to installation of the launching system on the *Mighty Servant 2*, an extensive modification on the stern of the vessel was carried out by Daewoo Shiprepair at Okpo, Korea.

Dockwise claims the major advantages of the self-propelled vessels are speed, maneuverability and safety resulting in competitive cargo insurance premiums, helping to reduce overall costs.

1969 Tonnage Convention HI Now Fully Operative

The International Convention on Tonnage Measurement of Ships, 1969, became fully operative on July 28, 12 years after it entered into force.

The Tonnage Convention was adopted at a conference held under the auspices of the International Maritime Organization (IMO). Its purpose is to introduce a universally recognized system for measuring the tonnage of ships. The 1969 Convention is intended to eliminate anomalies between existing systems, creating an internationally approved system.

Because of the need to have a system that applied to as many ships as possible, the requirement for entry into force was extremely high (25 states whose combined

merchant fleets represent 65 percent of the world's gt of merchant ships) and the Convention did not enter into force until 1982. Even then, existing ships were able to retain existing tonnage for an additional 12 years, to give shipowners time to phase in the new system as economically as possible. This grace period expired July 18.

The Tonnage Convention provides for both gross and net tonnages, both of which are calculated independently. The gt is a function of the molded volume of all enclosed spaces of the ship. The net tonnage is produced by a formula which is a function of the molded volume of all cargo spaces of the ship. The net tonnage shall not be taken as less than 30 percent of the gt.

Sea Cat Scotland In For Major Overhaul

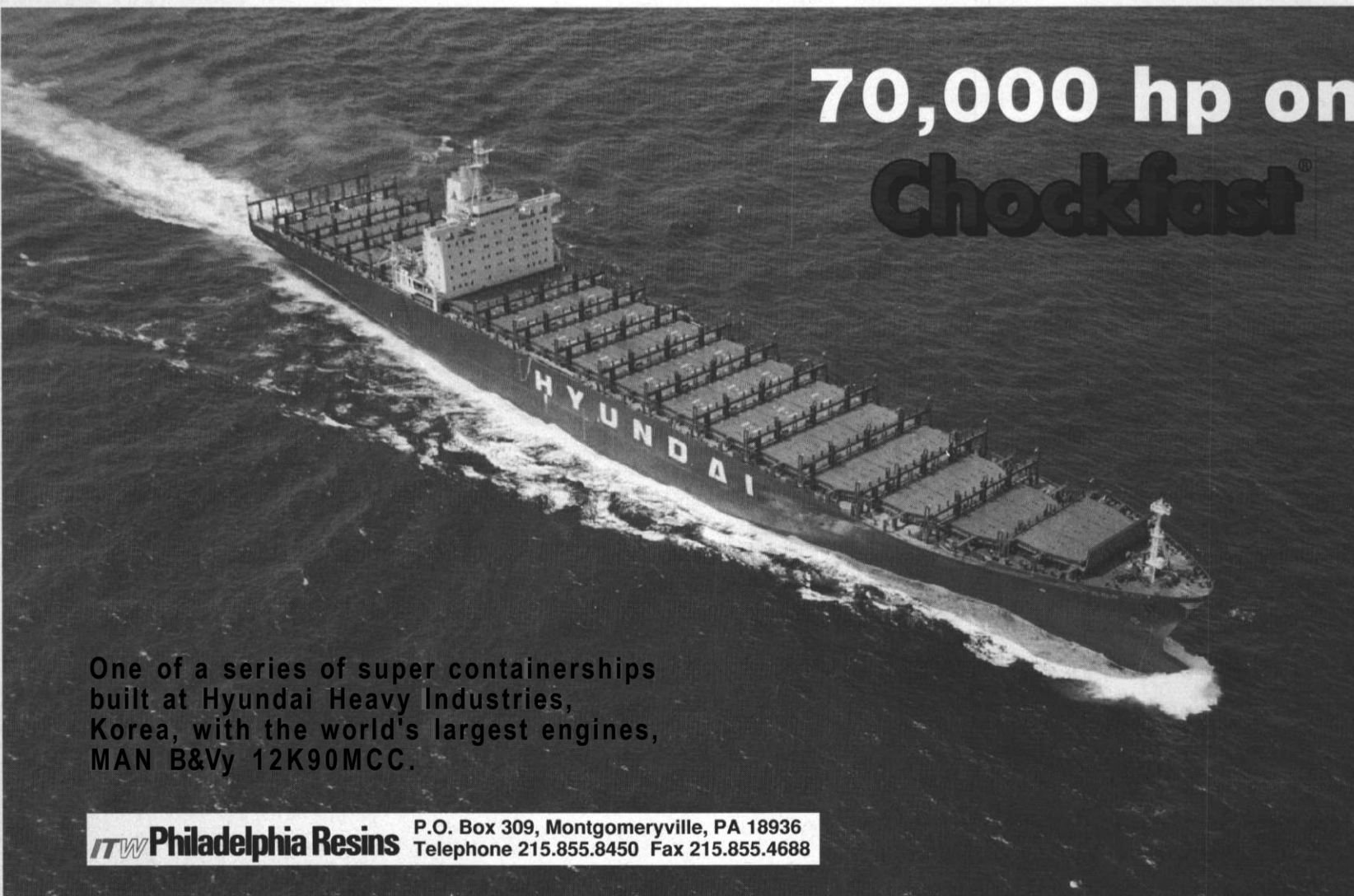
The *Sea Cat Scotland* is the first of the series which was recently docked at Scheldepoort for a major overhaul. Propelled by four waterjets, the Sea Cat type of catamaran ferry is built entirely of aluminum with stainless steel pipe systems. The four waterjets are driven by four Ruston 16V engines.

At Scheldepoort, the non-

steerable waterjets were also fitted with a steering mechanism. In total, about seven kilometers of cabling was installed, as well as new hydraulics.

The four main engines (with waterjets) were completely overhauled, the engine room's several stainless steel cold water pipes were moved, and a new type of lubricating oil cooler was installed.

Outside, skin damage was mended and tears in the construction were permanently repaired.



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USCG Announces Mandatory Registration of EPIRBs

The U.S. Coast Guard (USCG) announced that the Federal Communications Commission (FCC) is now requiring owners of 406 MHz Emergency Position Indicating Radio Beacons (EPIRBs) to register them with the National Oceanic and Atmospheric Administration (NOAA), effective September 13. This amendment is intended to enhance maritime safety by providing valuable vessel and point of contact information to search and

rescue personnel. This information will improve search and rescue effectiveness and efficiency, and is intended to reduce false alarm response costs. Registration can give search and rescue personnel a substantial response edge in a situation.

NOAA maintains an EPIRB database of more than 20,000 registered beacons. When a distress signal is received, the registration database is automatically checked using the beacon-unique code. Registration infor-

mation is automatically attached to a distress alert message and transmitted to the responsible Rescue Coordination Center. The new rule requires manufacturers to include registration instruction and a pre-paid, pre-addressed registration card with each beacon. For further information, contact USCG Public Affairs at the USCG Headquarters, Commandant (G-CP-2), 2100 Second St., S.W. Washington, D.C. 20593-0001, tel: (202) 267-0932.

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The PATHFINDER/ST raster display with ENP includes a navigation sensor interface, stored Navline maps (ARPA only), new "pop-up" menu operation, and configurable serial data output ports.

Navigation sensor input can accept NMEA sentence structure from conventional sensors such as differential GPS, GPS, or LORAN-C. A second input port is available that will accept information from a Syledis precision positioning system. The navigation sensor is used to position and stabilize

Navline maps on the PATHFINDER/ST ARPA display.

Operation of the PATHFINDER/ST ENP is simplified by the "pop-up" menus. Three main menus are: MAPS, OPERATE, and ARPA. The MAPS page is used to save, retrieve, edit, and control Navline maps. The OPERATE page contains operational functions such as: Vector Selection; Trial Maneuver, and Course Up. The ARPA page allows selection of features such as Collision Assessment Mode, Auto Drift, and Auto Acquisition.

Comparison Tests Prove PATHFINDER/ST Radars See What Others Can't.

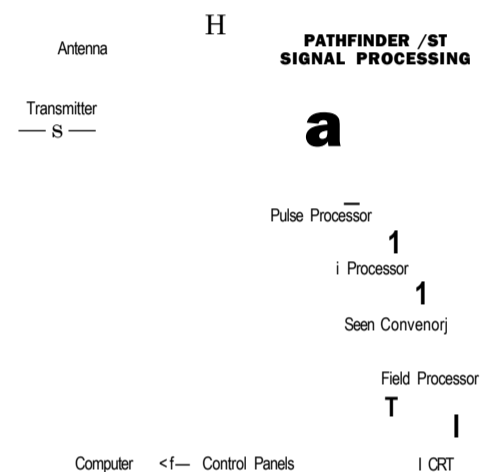
In side-by-side comparison tests, a PATHFINDER/ST display and a conventional radar display were connected to the same radar system. *PATHFINDER/ST consistently displayed targets not detected by the conventional display.*

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FINANCIAL UPDATE

Vessel Financing In The '90s

by Steve Isaacson, division vice president,
Safeco Credit Company, Inc.

Lenders faced a competitive and sluggish commercial loan market in 1993 and are looking at a number of industries, including marine, to generate higher commercial loan volumes. More lenders are doing marine deals today compared to five years ago, with the majority of them located or headquartered in the Gulf or on the East Coast.

What has changed over the last several years to help generate more interest in the marine towing industry from the financial community? It's been a decade since we've had the grain embargoes and a major recession in the shipping industry. Shipping has been healthy for some time and the number of ships calling on ports (West Coast) has remained steady. Many ships are now too big to transit the Panama

Canal and their increased size has meant bigger and more powerful tugs are needed to perform ship assist work. Shipping is expected to remain strong as the national economy continues to expand and our weakened dollar helps generate more grain or other bulk exports. That's good news for inland operators.

It's been close to a decade since the domestic oil and gas industries went through a major recession. The price of a barrel of oil has recovered from its record lows and is now hovering around \$19 a barrel (at press time). Construction activity and seismic work is up. Activity in the Gulf of Mexico is the busiest it's been in some time. Strengthening natural gas prices, along with deregulation of common carrier pipelines, have also helped spur activity.

The activity from these industries tends to drive the workboat economy. Vessel utilization has firmed up, forcing up charter rates and the market values for workboats. Day rates are the highest they've been since the late '70s. Stable and improving equipment values make for a good lending environment. During the past 12 months, we've seen the inventory of available good used tugs drop, causing the selling prices of tugs to climb. Other vessels such as supply boats, utility boats, crewboats, and certain types of barges are experiencing the same.

Other market segments, such as the cruise vessel and tourboat companies, did not suffer from the recession as much, and this market for used vessels has remained stable. The higher costs of building new passenger boats under the new U.S. Coast Guard (USCG) standards have put a premium value on the used market, especially those with SOLAS certificates.

Breaking Into The Business

With all this optimism, why aren't there more lenders interested in

going after marine business? First, it's difficult for any lender who doesn't have time-proven industry experience to jump in and start doing business with a complicated trade like marine. History has taught the surviving lender to start slowly and build on experience and knowledge. Second, the marine trade has become more complicated with issues facing the industry today that didn't exist 10 years ago. Whatever affects operators directly or indirectly affects the lender as well.

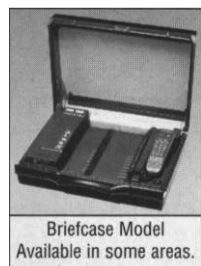
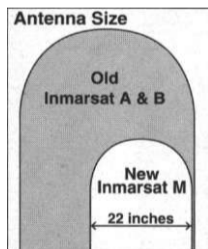
Lenders need to look at the regulatory and environmental influences in addition to an operator's balance sheet, in evaluating financing decisions. The first and probably the most important issue is the risk of unlimited liability to the operator and possibly the lender from the Oil Pollution Act of 1990 (OPA '90). Bareboat charters, as a tool for financing vessels, have almost become extinct because of the potential liability. Conventional lenders acknowledge the risks from OPA '90 as well, especially in the event that the vessel being financed should ever be taken over by the lender.

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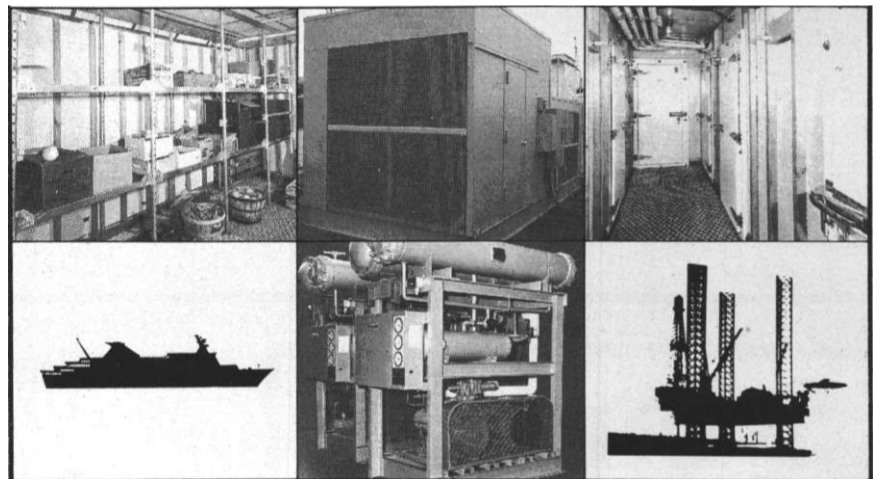
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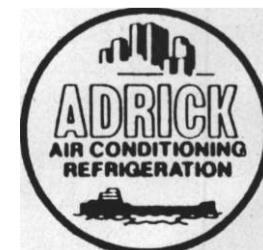
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One incident in particular involving a 1,000-gallon diesel fuel spill cost the lender \$200,000 in clean up costs. Some lenders don't want anything to do with certain types of vessels hauling black oil and others have put limitations on the types of cargo their vessels can carry.

Not everyone in the financial community is informed about the impacts of OPA '90; many are reacting out of fear, perhaps rightly so. There is also the question of obtaining

adequate insurance coverage, especially against pollution and tort claims. How much insurance is enough when you have unlimited liability?

Another area impacting many companies' operations is federal and state regulations such as the proposed required emissions by the EPA for vessels operating in Southern California, or the Endangered Species Act and its impact on companies operating in the Pacific North-

west. It's been demonstrated how politics affected the West Coast timber and fishing industries, and those in the industry are now wondering what impact politics will have on marine towing.

USCG regulations are becoming more challenging to keep up to date with, as well. Good examples include changing USCG requirements for tank barge vapor recovery systems and the proposed performance requirements for tug escorts. These

items may have an impact on a company's operations and the useful life and market value of a vessel.

The fundamentals for evaluating vessel financing requests have remained the same, focusing on the operator's ability to repay the loan. Proving the operator's ability to generate sufficient revenues to repay the debt should be an operator's primary goal for loan requests. Providing CPA Reviewed or Audited Statements along with projections goes a long way in establishing credibility with a lender. Most lenders have gotten more sophisticated in analyzing an operator's ability to generate cash, and reviewed or audited statements provide the necessary data to help evaluate the financial part of a business.

A lender's ability to approve marine loans is generally determined by its credit underwriting policies and its previous industry experience. Lenders are still only willing to be involved in industries where they haven't been hit by large losses and most have adopted their own minimum financial strength requirements for underwriting loans.

Choosing The Right Lender

How do you go about choosing a lender? Do you stay with one you've known for a long time, or do you test the waters to see what other institutions are offering to make sure you're getting the best deal? The primary goal of an operator should be finding a lender who has the industry experience and willingness to give you a loan with the terms and pricing you desire. Last winter, Safeco was asked to do a poll for the American Waterways Shipyard Annual Conference regarding trends in vessel financing which involved contacting a number of marine leaders nationwide to report on their financing practices.

It was found that some institutions were interested in lending only against certain types of vessels, and this should probably be one of an operator's first questions when approaching a lender. Some lenders have strict guidelines on the amount they can advance against a vessel while others will advance 100 percent of the cost if the credit quality is there.

There are fewer lenders who are set up to do construction financing. Some of the engine manufacturer financing subsidiaries, as well as some of the local banks, provide construction financing. Most lenders prefer to do only the long-term financing, but some, including Safeco, will provide interim construction financing along with long-term financing.

Lending Policies

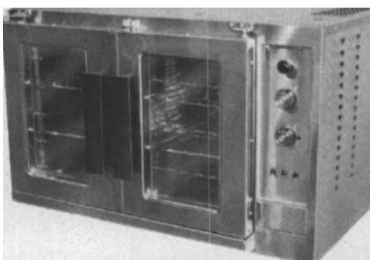
There are very few lenders who are willing to be all things to all companies. The possible exceptions are the marine engine manufacturing financing subsidiaries. These companies are doing some of the most aggressive lending today, with extended terms and minimal investment required by the operator, provided the operator is purchasing their engines. For venture capital requests, Safeco found a few firms

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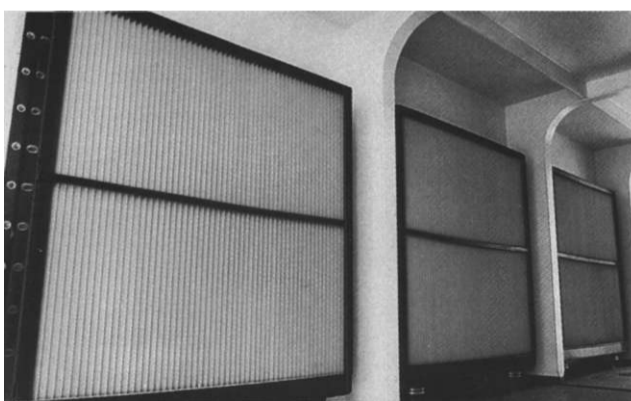
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willing to act as a lender of last resort if the operator was willing to grant the lender a minority equity interest to help offset some of the risk in the transaction.

The majority of financing done today is still with conventional loans. As one of the speakers at a recent conference on vessel financing in Seattle, I summarized the lending policies of 14 marine lenders. The survey showed that lenders active in marine loans today

have become much more focused on the markets they want to serve and the type of vessels they are willing to lend against. Presentations were also made by the federal Maritime Administration (MarAd). MarAd financing offers the longest terms in the industry today (typically over 20 years), normally at a below-market rate, but not without its cost. One of the operators at the conference discussed their last MarAd loan package and said that MarAd is a viable

choice, but the economics have to be right to put up with the reporting and fee requirements. The pricing and terms offered by conventional loan sources in the market place are attractive enough to question whether MarAd financing makes sense. It all depends on the operator's goals and needs.

The key is to know who to go to for a loan.

Once the right lender has been found, use the tools described above

to get a project funded.

Today, lenders are doing everything they can to retain good business.

Some lenders may help customers find an alternative funding source or participating loan requests with other lenders if they can't provide the financing themselves, to retain the customer's loyalty.

Providing exceptional customer service has taken on a new meaning for doing business in the '90s.

Dredging Feasibility Study For Jacksonville Harbor

The Jacksonville Port Authority (JAXPORT) and the U.S. Army Corps of Engineers, Jacksonville District, have taken an important step towards deepening Jacksonville's harbor from 38 ft. (11.5 m) to 42 ft. (13 m).

Corps District Engineer Col. Terrence C. Salt and JAXPORT Chairman Mark Hulseby signed a Feasibility Cost Share Agreement. Mr. Hulseby presented Col. Salt with a \$58,000 check from the Port Authority to begin the dredging feasibility study.

JAXPORT will provide more than \$1.1 million in cash and in-kind services through 1999, matching the federal government's contribution of the same amount.

The Feasibility Cost Share Agreement specifies the types and amounts of funding to be provided each year by the federal government and JAXPORT during the study, which will take about five years to complete.

The study will investigate and recommend solutions to water resource problems.

The cost-to-benefit ratio of a potential project will be examined to determine whether sufficient justification exists for federal participation in funding such a harbor deepening project.

The scope of the study runs from the channel entrance at Mayport to the Matthews Bridge and encompasses all JAXPORT terminals.

"We are beginning the most significant expansion in our port's history," said Mr. Hulseby, referring to the 20-year, \$934 million port development program adopted by JAXPORT's board of directors.

"Deepening the harbor is critical to that expansion and to the future success of our port. A deeper harbor will allow us to accommodate the larger vessels in the trade today as well as those that will be built over the next decade," continued Mr. Hulseby.

Industry experts believe container ships will be built in the next few years that will be capable of carrying 5,000 20-ft. containers, and will require a channel depth of more than 40 ft. (12 m).

Other companies operating in the harbor from about two dozen private terminals would also benefit from the harbor deepening.

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count on highly trained COMSAT operators such as Suzanne Loetz of our Santa Paula facility. Suzanne recently sprang into action to get quick rescue assistance to a cargo ship sailing near Indonesia after she received an urgent distress call saying the ship had been boarded by armed pirates.

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Effer Supplies Deco Telescoping Crane For Support Vessel

Effer delivered a telescoping crane, model Deco 200/2S, to the Kuwait Oil Company for use on the support vessel *Fateen*.

The Deco 200, with its two hydraulic telescoping extensions, has a maximum outreach of more than 75 ft. (23 m). Separated and external extension cylinders reportedly

enable the operator to quickly reach the maximum outreach, while allowing for easy maintenance. Octagonal booms are designed to stabilize lifting operations in rough sea. A 20-ton capacity winch is mounted on the boom.

For more information on Effer
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The Kuwait Oil Company says the Effer crane was chosen for its compactness and flexibility, which suited the relatively small *Fateen*.



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Japan's July Ship Orders Rise 251% Over June

New orders for vessels in Japan totalled 2,327,000 gt (46 vessels) in July 1994. July's figure is 251 percent higher (1,663,000 gt — 17 vessels more) than June 1994's figure. July's figure is also 805 percent higher than that achieved in the same month in FY '93. The types of ships ordered were 23 bulk carriers; 1 RoRo; three cargo ships; eight oil tankers; one car ferry; one product carrier; and nine containerships. New orders in Japan's fiscal year (April 1994 to July 1994) total 4,309,276 gt. This is a 211 percent increase on the same period in FY '93.

Todd Selects Amclean Ultra-High Pressure Waterjet System

Todd Pacific Shipyards announced the results of the field testing of three ultra-high pressure waterjet systems. Following the successful completion of Amclean's removal of the Inerta 160 coating from the icebreaker USCG *Polar Star*, Todd requested shipyard performance tests to determine the production rates and operational issues associated with a number of ultra-high pressure waterjet systems. Performance and production tests were conducted at Todd's Seattle shipyard on aft keel and midship freeboard areas of the *Polar Star*. Testing was performed to enable Todd to make a definitive determination as to which system would be selected to facilitate Todd's transition from traditional abrasives blasting to ultra-high pressure waterjet technology. This transition will maintain Todd's standards of environmental awareness, as well as provide Todd with the latest technology in ultra-high waterjet systems. Each manufacturer was asked to prepare surfaces to meet SSPC-10 specifications. The zinc/alkyd coating on the freeboard section of the *Polar Star*, with a thickness of 15-20 mils, was representative of the majority of heavy marine coatings removal work.

The test results demonstrated that Amclean's Ultra-Strip Process was what Todd was seeking in an ultra-high pressure waterjet system.

For more information on Amclean
Circle 15 on Reader Service Card

Maritime Reporter/Engineering News

SHIP CASUALTIES

S

III! Reports A Disappointing First Half of '94

According to the Institute of London Underwriters (ILU) merchant ship casualty has shown a deterioration during the first six months of the year, continuing the downward trend from the first quarter.

Statistics from ILU applying to ships of 500 gt and more show that in the first six months, 48 ships totalling 612,037 gt were lost. Compared to the same period last year, this represents eight fewer ships but nearly double the tonnage, up from 308,395 gt lost during the first six months of 1993. However, it must be taken into account that just four ships (a tankers and three bulk carriers) accounted for about 50 percent of the first-half 1994 total.

In addition to the 48 ships, during the first six months another 22 vessels were confirmed total losses as a result of casualty occurring during previous years.

ILU said, "As 1993 showed a distinct improvement in loss ratios, these statistics are disappointing for marine underwriters. Based on updated figures, 136 ships totalling 886,716-gt were totally lost in 1993. Thus, unless there is a radical improvement during the second half of this year ... we could be heading for a tonnage loss exceeding one

million gt, which would equate with the tonnage lost in 1992."

Loss Of Life

"Although it is extremely difficult

to collate figures accurately, our casualty reports show that 274 people were either killed or reported missing as a result of total and partial losses in the January-June period.

The total includes some passengers," said the ILU. "This figure compares with 613 for the whole of 1993 and 386 for 1992. Our statistics apply only to ships of 500 gt and over, which means that many small fishing vessels and other craft (such as small ferries) are excluded."



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Types of Ships

By vessel type, the 48 total losses in the first half of this year represented:

General cargo.....	15
Oil/chemical.....	6
Liquid gas carrier.....	1
Bulk carriers.....	7
Ore/bulk/oil carrier.....	1
Fishing/trawling.....	8
Cement carrier.....	1
Refrigerated cargo.....	2
RoRo cargo.....	2
Passenger/RoRo cargo.....	3
Livestock carrier.....	1
Tug/salvage.....	1
Total.....	48

Flag Losses

Panama.....	9
Cyprus.....	7
Malta.....	4
Honduras.....	3
Indonesia.....	3
China.....	2
St. Vincent & Grenadines.....	2

Philippines, Denmark, Egypt, India, Nigeria, Turkey, Norway, Liberia, France, Italy, Bahamas, S. Korea, Romania, Mexico, Ukraine, Venezuela, Ecuador & U.S. all had 1.

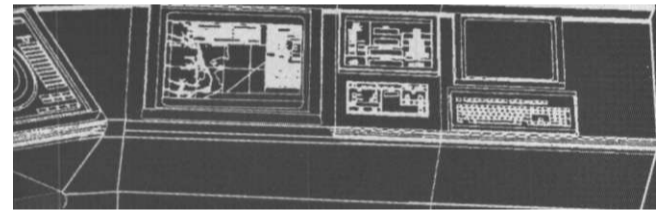
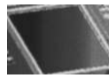
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CRIS:

An Affordable, High-Risk Insurance Solution

The Credit Rating and Insurance System (CRIS) — a specialized and reportedly realistically priced credit risk insurance plan, tailored to meet the debt protection and credit information needs of the international marine industry — was launched recently by designer/manager marine insurance specialists Clausius Skandinavia AS of Oslo (a subsidiary of Hubertus Clausius OHG of Hamburg, a German credit risk insurer).

The plan is designed primarily to meet the credit risk insurance needs of the \$20 billion marine bunker market, because of that industry's high degree of exposure to credit risk. But it is reportedly also suitable for any company supplying goods to the marine industry on credit, providing that company has a high enough annual turnover. The insurance is being underwritten by Trade Indemnity PLC, which underwrites approximately \$76 billion worth of business a year and is one of the world's leading credit risk insurers.

Before a risk is accepted, a positive report and credit rating on the clients' customer portfolio must be given by MRC Business Information Group Limited of Oxford, one of the world's leading marine credit analysts. Full MRC reports on each of the supplier's customers are included within the plan.

Premium levels are expected to be realistically priced at a fraction of one percent of annual turnover. In the case of the bunker industry, premiums are likely to be well under 50 cents a ton supplied. This is in an industry where the cost of an average stem is around \$70,000, payment is normally on credit, and credit lines to individual customers can be as much as \$250,000 at any one time — and in some cases much higher than that. The CRIS system: provides insurance against bankruptcy, insolvency or protracted default; provides continual access to MRC Marine status reports, credit ratings and updates on existing and potential customers; provides the option in certain cases to buy additional cover against political risks; and provides a maximum of 12-hour response time to confirm cover on prospective new customers of the insured.

Suppliers will be given indicated limits on their biggest customers when applying for a quotation from CRIS, and full MRC credit reports and ratings on all their customers within a month of joining the plan. New customers can be added at any time during the year, subject to a positive rating. Rating indications for spot businesses can be provided within hours.

The insured customers are monitored during the year by MRC. If one of the insured's customers suddenly becomes a very high credit risk, the insured is informed immediately so that steps can be taken to avoid the possibility of future losses. All completed or contracted busi-

ness with that customer is still insured.

Graham Watts, managing director of Clausius Skandinavia AS, said, "One of the advantages of this scheme is that capital freed from the risk of bad debts can be used positively to expand the business."

Another advantage is that it

should be possible for the insured to negotiate better credit terms from banks and suppliers, once they know that the business is not at risk from bad debts because it is insured.

Mr. **Watts** said, "This scheme does not mean that an insured needs to be less diligent about credit control. (The insured) has a duty to see that the business is conducted prudently and that all steps are taken to minimize potential bad debts ... The insurance is a safety net de-

signed to protect companies who face a bad debt despite exercising proper business judgement. The quality of the information MRC supplies is a major plus for the insured and a vital element in the whole CRIS scheme. MRC's strong track record in assessing marine companies will help the insurers and the insured alike in making the best commercial decisions in respect of their client's credit exposures."

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One of three Colvic patrol vessels stationed in Corfu during the European Union Summit.

Colvic Craft Delivers 12 Of 44 Patrol Vessels To Greek Coastguard

Colvic Craft PLC, England, delivered the first 12 vessels of an order for 44 patrol boats for the Greek Coastguard.

At the June European Union (EU) Summit held in Corfu, three of the new Colvic Craft patrol craft played

a key role in the security measures used by the Greek authorities to protect the visiting heads of state who were present for the Summit.

Two of the boats were from Athens and made the trip to Corfu for the conference. The third boat is permanently stationed in Corfu to patrol waters around the island.

The hulls of all the vessels were molded and partly completed by Colvic Craft in its factory near

Colchester before being shipped to Greece for final fitting-out by Motomarine SA, including the fitting-out of German-built MAN diesel engines.

A 13th vessel was launched at Motomarine's slipway and is commencing sea trials.

Bay Fabrication Lengthens OSV *Enesco Endeavor*

Bay Fabrication, Inc. of Panama City, Fla. delivered the lengthened 146-ft. (44.5-m) *Enesco Endeavor* to Enesco Marine Company, Broussard, La.

The *Enesco Endeavor* was originally built as a 116-ft. by 26-ft. by 10-ft. (35-m by 8-m by 3-m) utility vessel in 1981 by Scully Brothers and was bought by Enesco Marine Company when it acquired Argosy Offshore Ltd.'s fleet.

Enesco contracted with Bay Fabrication to install a 30-ft. midbody, in addition to performing traditional drydock work. Design work was provided by Design Associates, Inc. of New Orleans, La.

The converted vessel features a clear deck length of 98 ft. and can carry 185 long tons of deck cargo. One Detroit Diesel 8V-71 pump engine was installed and equipped with Twin Disc front and rear clutched P.T.O.s.

Bay Fabrication has lengthened five vessels for Enesco Marine at its facility: *Enesco Cruiser*, *Enesco Transport*, *Enesco Schooner*, *Enesco Galleon* and now the *Enesco Endeavor*.

For more information on Bay Fabrication
Circle 124 on Reader Service Card

Cutters Become First N.A. Surface Ships To Reach North Pole

The U.S. Coast Guard (USCG) Cutter *Polar Sea* and the Canadian Coast Guard Cutter *Louis S. Ste. Laurent* reached the North Pole on August 22, becoming the first North American surface ships to reach the North Pole.

The *Polar Sea* is a 399-ft. (122-m) icebreaker from Seattle, Wash., and the *Ste. Laurent* is a 396-ft. (121-m) icebreaker from Halifax, Nova Scotia. The two ships are taking part in Arctic Ocean Section 1994, a joint U.S./Canada science project. They are conducting an extensive, multidisciplinary scientific study that began in Nome, Alaska on July 24 and will end in late September in Barrow, Alaska.

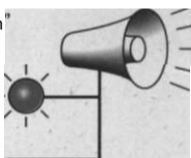
This expedition is the culmination of four years of joint planning by government agencies in the U.S. and Canada. Researchers from more than 20 institutions will participate in the studies, which suggest that all aspects of global change may be amplified in the Arctic. Until now, the sparsity of basic shipborne measurements of the world's least-studied ocean have made it impossible to understand the processes which drive global climate change.

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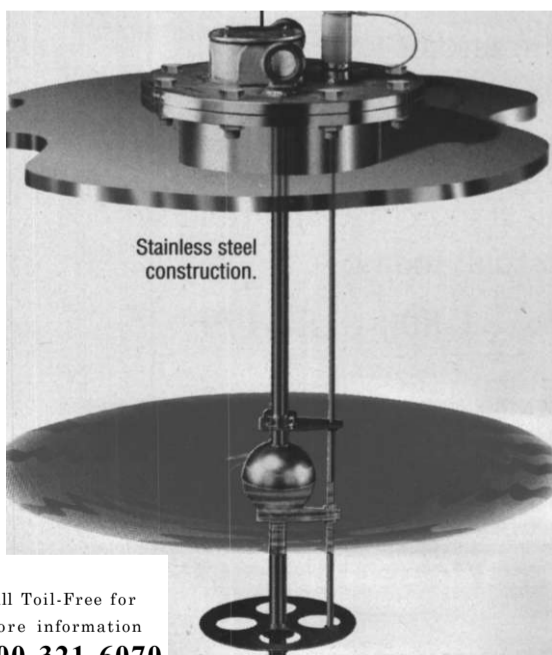


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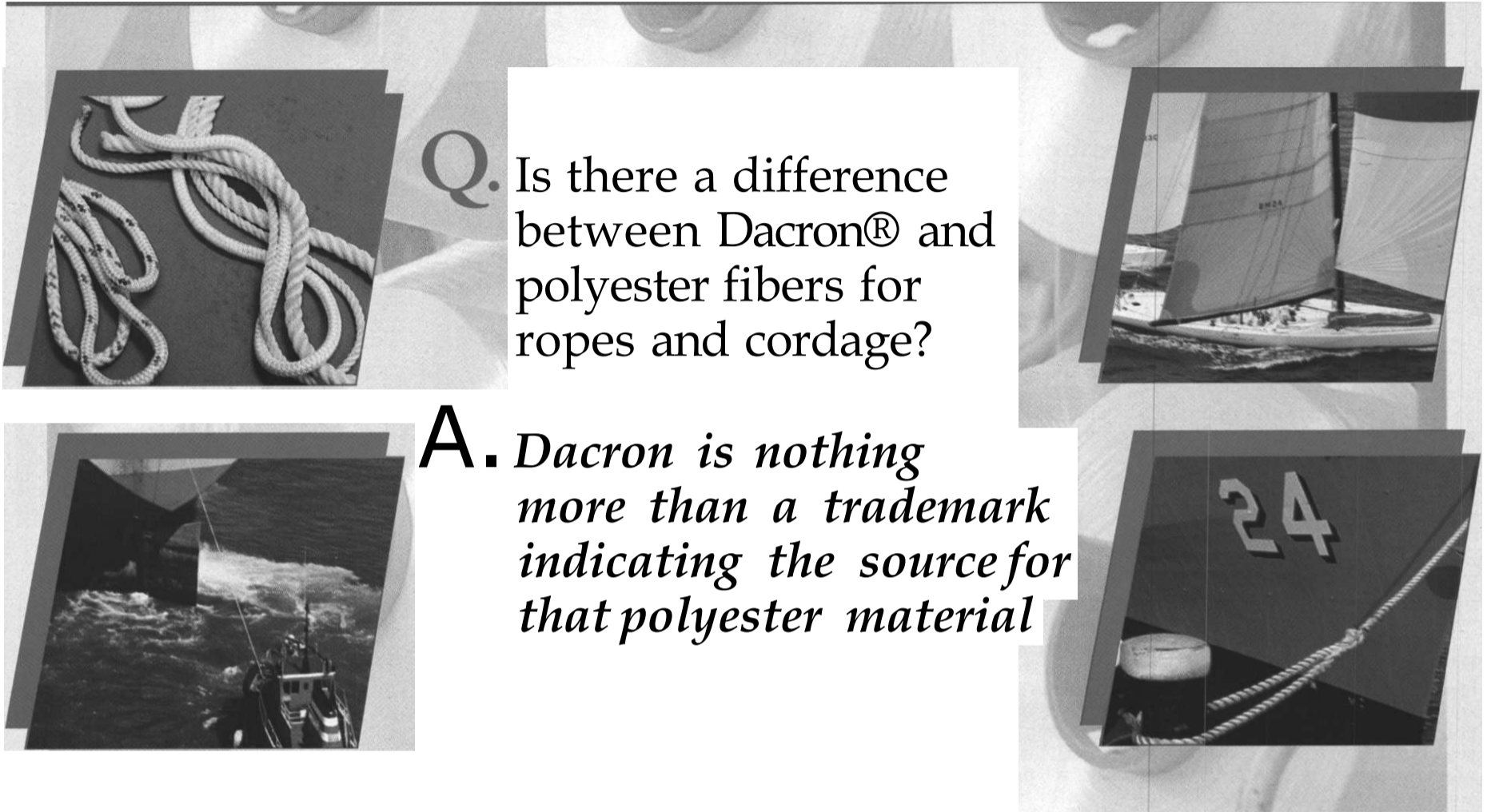


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A Commonly Asked Question From Our Readers

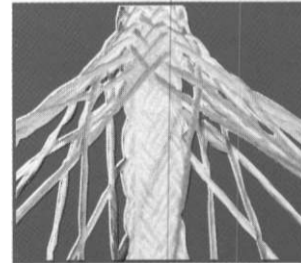
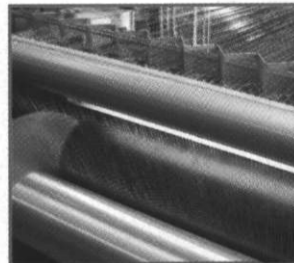
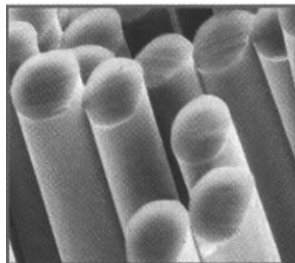
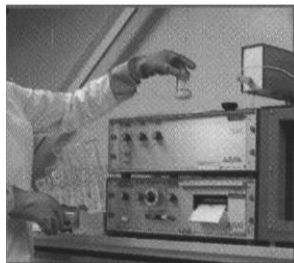


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application. All polyester offers great flexibility in manufacturing. This is exemplified by AlliedSignal Fibers application-oriented line of polyester products. Polyester can have ultra-low elongation (for heavy lifting applications), high modulus (for tires), or low shrinkage (for broad woven fabrics).

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optimal properties required for the wet environment. And, our revolutionary SeaGard® overfinish ensures the ultimate performance and protection against wet abrasion for polyester, as well as nylon.

When considering any type or brand of polyester, be aware of the engineered properties required for your application. The more important question is: which polyester is the best engineered product for the specific application?

For further information, contact AlliedSignal Fibers, 224 West 35th Street, Suite #1500, New York, NY 10001.



Designs for the 21st century

by

Carol Fulford and Andy Smith,
international editors

The U.K.'s public-funded maritime rescue organization — the Royal National Lifeboat Institution (RNLI) — is well into its ambitious and costly newbuild program to replace the aging Waveney and Arun class lifeboats.

Such a move is the result of much long term research and development work by the organization's in-house technical team with the result that the vessels, in the new classification types of Severn and Trent, are some of the most advanced rescue craft of their type anywhere in the world.

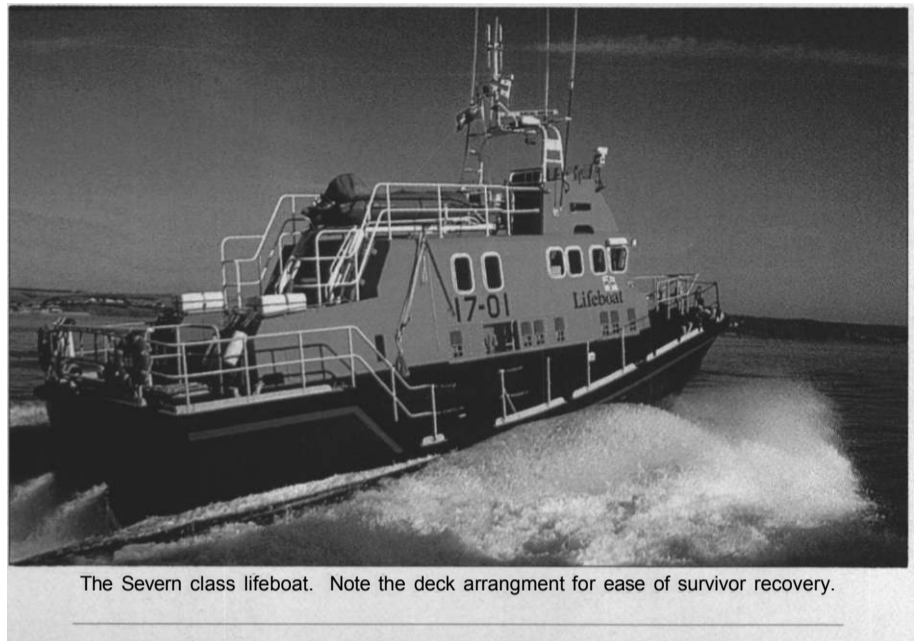
Renowned for more than a century for the efficiency of its rescue operation, the RNLI has been well served by the Arun and Waveney classes — which at the time of conception were the state-of-the-art afloat boats of the fleet. Twenty years later, the replacements which take up the sheltered, deep water moorings around the British coast are again of two different sizes, with the Severn at 56 ft. (17 m) and the Trent at 46 ft. (14 m), but are capable of greater speeds in keeping with the RNLI's modern strategy to be able to reach virtually any

point 50 miles off the coast in just two and a half hours.

Reliability and ease of maintenance have been key considerations in the design of both vessels and much debate and testing has taken place to determine the most efficient hull form for the purpose.

For both types, hard chine and round bilge versions were subject to early consideration, although gut reactions in favor of the former were strong early on. Decisions were, however, complicated by the need to provide a relatively high free-running speed with full propeller protection and the ability to take the ground. Ducted propellers were rejected and a decision was made to incorporate deep tunnels into the hull form.

Extensive tank testing of scale models was carried out as part of the design process, followed by instrumented sea-keeping tests which used the tank-test models fitted with engines for free-running under radio control. The models, which were of round bilge and hard chine hull form, were tested in a variety of equivalent sea conditions ranging from Force 3 to 7. Extensive tests were carried out to investigate self-right-



The Severn class lifeboat. Note the deck arrangement for ease of survivor recovery.

ing capabilities, seakeeping ability at various speeds in regular and irregular waves and maneuverability in calm waters.

Although both hull forms were subjected to rigorous testing, the technical team spent little time debating the material of construction, deciding early on that the combination of strength and relative light weight afforded by fiber reinforced composite (FRC) would prove the ideal choice. As a result, the Trent's hull, deck and superstructure are of sandwich construction and a single skin selected for the bottom shell of the Severn.

Another vital design consideration was the need to limit ingress of water by suitable sub-division to guard against capsizing in the event of damage to the hull.

The hull of the Severn is subdivided into seven compartments while the hull of the Trent has six subdivisions.

The latter also relies upon its sandwich construction for the provision of appropriate double bottom protection.

The now traditional reverse sheer line of the hull, which drops away to a point just aft of midships to assist in the recovery of survivors from the water, is adopted.

A survivor lifting A-frame is provided to assist with the requirement. The Severn also has a well deck to port and starboard to assist further in survivor recovery.

For operations in shallow water or confined space, the Severn carries an inflatable on the wheelhouse roof.

In a major departure from all other RNLI boats, the engine room for both new classes is positioned right aft to provide more space and facilitate maintenance.

Both engines on the Severn drive

their propeller through a V-drive shaft while on the Trent the engines are staggered — one engine driving through a V-drive shaft, and the other engine with a conventional straight drive.

Engines can be removed easily when required through large hatches positioned on the after deck. Fuel is contained in flexible bag tanks supported by, but not attached to, the vessel's structure.

The bags contain foam blocks to maintain their shape when not completely full — and with maximum capacity of around 1,150 gallons (5,200 liters), ensure a range of not less than 250 miles at maximum speed.

Engine room ventilation also proved a challenge in order to provide enough engine combustion and cooling air without sacrificing self-righting ability or ease of maintenance.

The 16-in. axial flow fans are hydraulically driven from each main engine — the faster the engine runs, the faster the fan goes. Specially developed capsizing flaps are incorporated in both the intake and extractor trunking to prevent flooding in the event of a capsizing. The Severn is also fitted with a bowthruster for low-speed maneuverability, as its large superstructure and fly bridge make it prone to cross winds at low speed.

Interior space for both vessel types has been used carefully. The Severn's deckhouse contains permanent seating for a crew of six and a doctor, together with two stretcher positions.

There is provision for two additional stretchers in the lower survivor space.

Aboard the Trent, seating for ten

(Continued on page 22)



The Altaire, newly delivered to a Shetland Islands skipper, was built by Norwegian yard Langsten Slip.

Tuna war and subsidy accusations add to fishing industry woes

by
Carol Fulford and Andy Smith,
international editors

Controversy continues to plague the European fishing industry. Within days a so-called "tuna war" hit the headlines with ax-wielding Spanish fishermen boarding British drift netters and news broke of a spate of newbuild orders going to foreign yards amid accusations of unfair government subsidies.

Despite EC edicts, national rivalries will not go away and Spanish trolling fishermen were reportedly not happy with the netting activities of both British and French boats among the dwindling tuna stocks of the Bay of Biscay, a stock which they have traditionally thought of as their own. Both the British and French governments dispatched fishery patrol vessels to the area with little positive effect—the British ship promptly falsely arrested one of its own nation's boats (called by some an attempt to perpetuate a reputation for fair play) while the French navy reportedly fired water cannons at Greenpeace's *Rainbow Warrior*.

Additional discord was sparked off, although almost certainly unfairly, by the arrival in the remote Shetland Islands (part of the U.K. to the north of Scotland) of *Altaire*, a 243-ft. (74.2-m), 2,500-ton fish capacity Norwegian built dedicated tank trawler which, if not the largest of its type, is definitely one of the most sophisticated. Built for local owners at a cost of almost \$15 million by Langsten Slip & Batbyggeri AS of Tomrefjord, the vessel is a pure pelagic trawler of all welded steel construction powered by a Wartsila Wichmann main engine developing 4,330 kW (6,000 hp) driving a four-bladed CP propeller inside a nozzle, with Brunvoll thrusters at both bow and stern.

Undoubtedly Langsten Slip's considerable expertise in building sophisticated vessels of this size was instrumental in obtaining the order. News, however, that orders were about to be placed with Norwegian yards by Scottish owners for two 190-ft. (58-m) ships and that the Parnica yard in Poland is to build a 90-ft. (27.5-m) vessel brought forth cries of "foul play" from several quarters, especially as this followed the recent success of Spanish yards in obtaining orders from the same region. The Polish situation is complicated by rumors, currently under investigation, that EC aid money is finding its way into shipyards in Poland, although the successful yard contends that cheap labor rates are responsible for its price, rather than subsidy. The problem is, however, how to define an illegal subsidy. Would a large long-term government contract for, say, sectional steel

storage tanks, a contract that most shipyards could easily fulfill, be considered a shipbuilding subsidy? Clearly, such a contract would help a yard offset overheads, keep skilled people in productive work and, with

a little co-operation, aid cash flow — enabling it to be just that shade more competitive.

National characteristics play a large part. In the U.K., the country perhaps most affected by losing orders, the argument is put forward that the government needs to learn to play the game by the rules as others apply them and to be as considerate to its industry as its European neighbors are to theirs —

"fair play" can have another meaning.

Not all is doom and gloom in the U.K. yards, however, with highly respected Scottish yard Jones of Buckie picking up orders for a couple of steel trawlers, at 78.7 ft. (24 m) and 91.8 ft. (28 m).

MacDuff Shipyard is building a 61-ft. (18.6-m) steel trawler for an English customer and a 68-ft. (20.7-m) wooden vessel for a local skipper.



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"Tuna War"

(Continued, from page 21)

Cygnus Marine, located at the other end of the country in Cornwall, renowned over the years as the U.K.'s most prolific builder of GRP crabbers, netters, potters, longliners and small trawlers with a multitude of well proven molds, has recently shipped three identical 33-ft. (10-m) longliners to the Seychelles.

Designs for the 21st Century

(Continued from page 20)

survivors is situated in a dedicated survivor space forward of the fuel tank space with access from the wheelhouse and the foredeck. This area also houses a toilet, galley and stowage for lifejackets.

The wheelhouse has seating for

six crew and an honorary medical advisor. The coxswain's seat is on the port side of the wheelhouse unlike in other RNLI boats where it is on the centerline.

A flying bridge situated on the wheelhouse top provides repeat en-

gine controls and monitoring equipment, steering and some communication equipment.

Electronics on both boats includes an echosounder, speed log, anemometer, GPS satnav, medium frequency radio transmitter and receiver, VHF radio, MF/VHF direction finder and an intercom system.

To date, an early prototype Trent has performed in line with expectations while on temporary station duty at Alderney in the Channel Isles, and the first production vessel has now been accepted at Ramsgate. Eight additional Trent class and four Severn class lifeboats are now in various stages of completion with the first Severn due to enter service at Stornaway early next year. Pre-production examples of each have undertaken a circumnavigation of the British Isles to obtain wider experience of different environments and to enable as many different people as possible to comment upon them.

Selected builders and outfitters are in the main located on England's south coast and include FBM Marine, Halmatic, Berthon Boat Co., and renowned lifeboat builder **William Osborne**, of Souter and Osborne. Much of the selection process has had to be based around the few existing yards which can deal effectively with the special demands of FRC construction. FBM Marine and Halmatic, for example, have in recent years invested considerable amounts of money in improving GRP/FRC facilities.

In addition to the conventional lifeboats, the RNLI, which last year raised \$95 million from the British public for its operation, has also turned its attention to its substantial rigid inflatable fleet. As such, increased production of the Atlantic 75, designed and built by the RNLI at its Inshore Lifeboat Center in Cowes on the Isle of Wight, is in hand. These boats, updates of the original Atlantic 21 which has been in operation since 1972, are capable of up to 34 knots and will join the Trent and Severn in ensuring that the RNLI enters the 21st Century with all the makings of a modern fleet.

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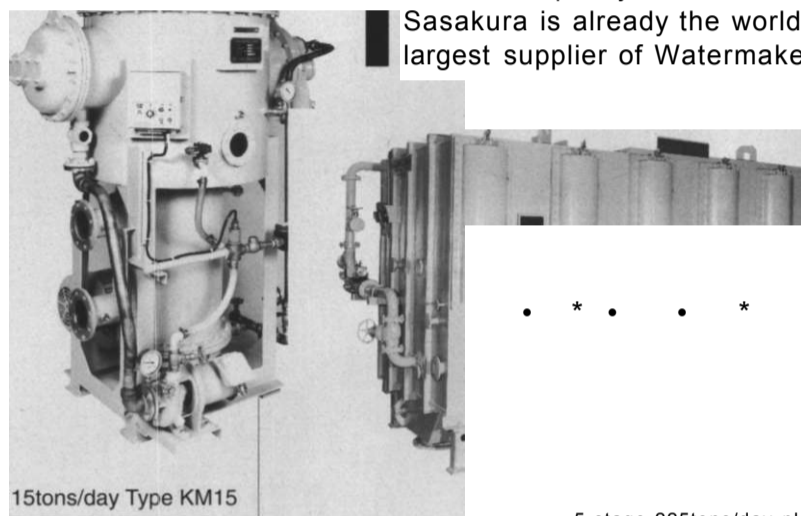
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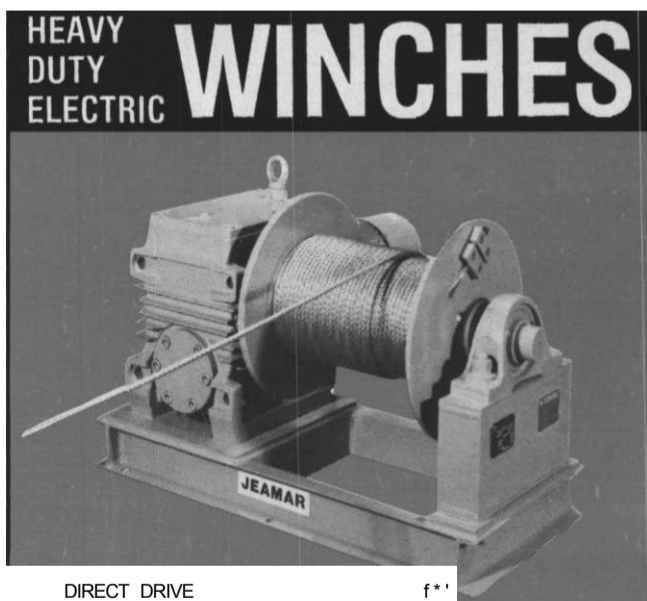
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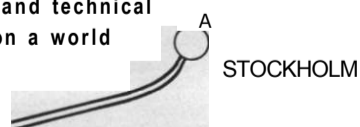
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Maximum Vessel Length To Transit Seaway Is Increased

U.S. Saint Lawrence Seaway Development Corporation Administrator **Stanford E. Parris** announced that the maximum vessel length to transit the St. Lawrence Seaway and its 15 locks has been increased from 730 (222.5 m) to 740 ft. (225.5 m)—the first vessel length increase in the waterway's 35-year history.

The increase is the third non-structural improvement made to the Seaway in the past year by the Saint Lawrence Seaway Development Corporation and the Canadian St. Lawrence Seaway Authority.

In late 1993, the Seaway entities increased the maximum sailing draft three inches to 26.25 ft. (8 m)

from 26 ft. (7.92 m) for both directions throughout the entire navigation season — a seemingly small increase which allowed the passage of vessels carrying much greater tonnage.

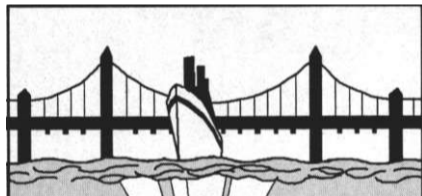
Earlier this year, the maximum vessel beam to transit the Seaway's locks was increased from 76 ft. (23.1 m) to 78 ft. (23.8 m).

Administrator **Parris** said that the increase was another step in improving shipping on the Seaway, and that the increases would be important for newbuilding of Seaway vessels under the Seaway's proposed vessel incentive plan, which proposes offering Seaway toll discounts to newbuild vessels built to Seaway specifications.

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NASSCO Awards WestPac \$1.2 Million-Plus Award

WestPac Industries, Cardiff-by-the-Sea, Calif., was awarded orders totaling upwards of \$1.2 million from National Steel and Shipbuilding Co. (NASSCO), San Diego, Calif. WestPac is providing mooring hardware for three Military Sealift Command vessels under conversion at NASSCO. These vessels are used for the rapid deployment of supplies to troops.

For more information on WestPac Circle 123 on Reader Service Card

Bisso Marine Completes Lift

Bisso Marine Company, Inc., of New Orleans, La., completed a 638-ton lift at the Greens Bayou terminal.

Bisso Marine's derrick barge Cappy Bisso lifted the 638-ton pressure vessel from the M/S Carola I and loaded it onto heavy haul trailers positioned on the barge. The cargo was handled by Schenker In-

ternational, Inc., Houston, Texas. For more information on Bisso Marine Circle 132 on Reader Service Card

Gulf & Atlantic Marine Services Names New Sales Manager

Nancy Newsom has been named Gulf & Atlantic Maritime Service's Sales Manager for northern California. Ms. **Newsom** will be located in San Francisco and her primary responsibilities will include logistics and project management, pricing and negotiation, as well as customer service and sales support.

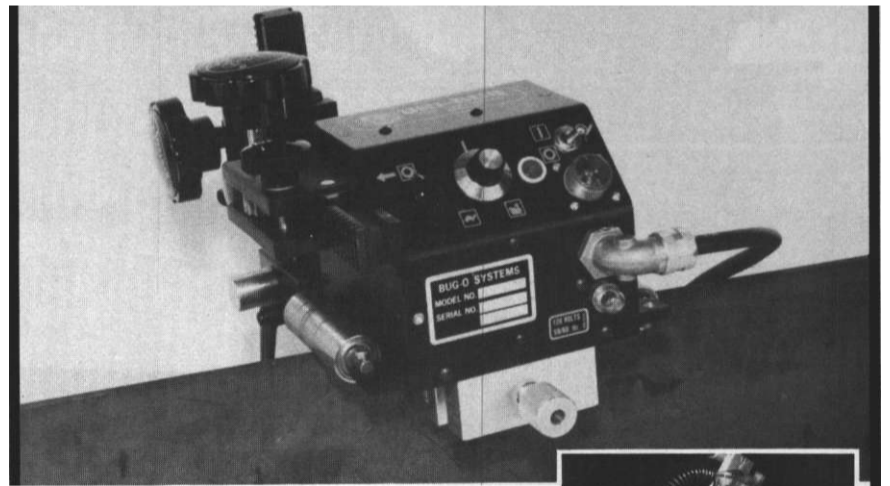
Prior to joining Gulf & Atlantic, Ms. **Newsom** was employed by Atlantic Container Line for two years as the pricing and special projects manager.

Ms. **Newsom** managed export pricing decisions in the \$170 million market for a major European carrier.

Ms. **Newsom** also worked at Matron Freight Agencies for two years.

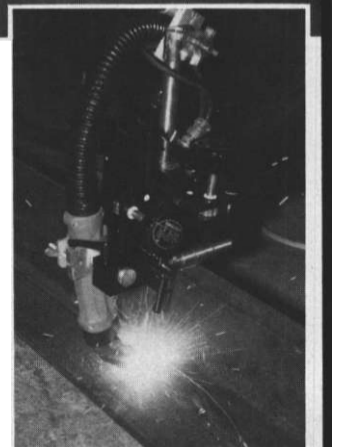
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Gladding-Hearn Delivers High-Speed Cat To Maine Whale Watch Co.

Reportedly the nation's first high-speed whale-watch vessel was delivered to Bar Harbor Whale Watch Company, Bar Harbor, Me., by Gladding-Hearn Shipbuilding, Somerset, Mass., licensee for Australia-based International Catama-

ran Designs (Incat). The new 92-ft. (28-m), 149-passenger catamaran, *Friendship TV*, is powered by twin 815-hp Detroit Diesel DDEC engines. Gladding-Hearn claims the vessel is the fastest whale watching boat in North America, with a top speed of more than 28 knots.

Owner **Marc Brent** said the vessel's top speed will allow his company to make three daily whale watch trips instead of two.

Unlike other catamarans built by Gladding-Hearn, the all-aluminum vessel incorporates Incat's unique Z-Bow configuration, adapted from the designer's wave-piercing catamaran. The resulting longer waterline reportedly improves the vessel's high-speed performance and adds buoyancy for passengers.

For more from Gladding-Hearn
Circle 14 on Reader Service Card

500-Passenger Catamaran Being Built At Marinteknik

A 500-passenger aluminum catamaran is under construction at Marinteknik Shipbuilders Pte. Ltd., Singapore, for the Discovery Bay company. The catamaran, *Discovery Bay I*, is 138 ft. (42 m) long, with a beam of 38 ft. (11.5 m) and draft of 4 ft. (1.3 m). The hulls and platform are made of aluminum extrusions designed and developed by Marinteknik, producing a light craft. Two MJP waterjets reportedly give the vessel a high degree of maneuverability, shallow draft, minimal wash and wake signatures, and high propulsive efficiency. The vessel's main engines are two MWM TBD 620 V12s.

For more information on Marinteknik
Circle 72 on Reader Service Card

Elliott Bay Design Group Performs Finite Element Analysis For Arco

Elliott Bay Design Group (EBDG) of Seattle, Wash., offers finite element analysis to help its clients with the challenge of maintaining their escort tugs' deck equipment and ability to handle higher loads.

EBDG provided finite element analysis for Arco, analyzing parts of the bow mooring arrangements on the tanker *Arco Texas*.

Elliott Bay previously performed a similar analysis for Arco on some of the stern mooring points aboard the tanker *Arco Anchorage*, looking at loads experienced during ship maneuvering assistance provided by large ship-assist tugs. In both cases, the analysis included onboard inspection of the vessel by a team from EBDG, ultrasonic testing, and verification of supporting structure for all deck fittings.

"We created a finite elements model," said Elliott Bay President **John Waterhouse**, "which is analyzed for different loads to determine the safe working load under the most extreme anticipated conditions. We provide a complete report to the client, so they can make decisions on potential vessel modifications to accommodate the increased loads from these new-generation tugs."

For more information on
Elliott Bay Design Group
Circle 73 on Reader Service Card

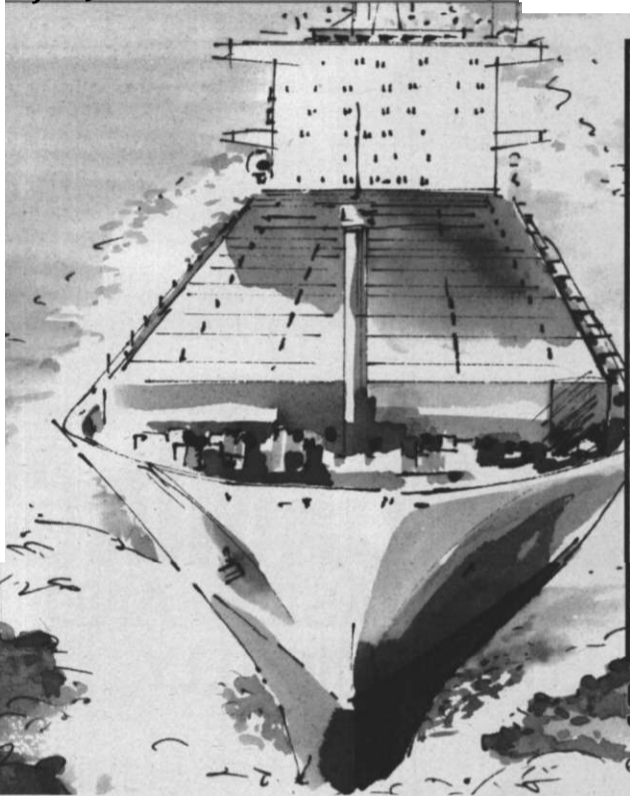
Yanmar Diesel Outboards Receive SOLAS Approval

Yanmar diesel outboards were approved by the U.S. Coast Guard in accordance with Safety Of Life At Sea (SOLAS) 74/83 regulations for rescue boat applications.

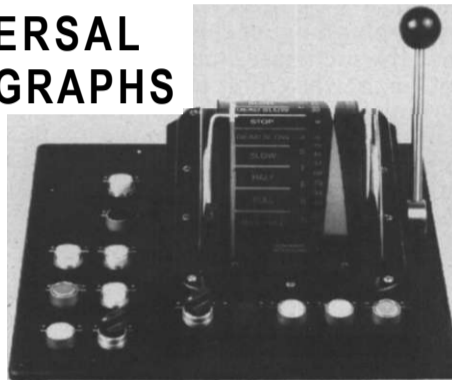
The International Convention on SOLAS has established highly critical requirements for design, construction and performance of equipment used in marine emergencies. Both Yanmar's 27 hp and 36 hp diesel outboards meet these standards.

Maritime Reporter/Engineering News

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SMM '94 Special Edition

Page Story

97 EDITORIAL:
u VSM's Ulrike Nieter
Assesses German
Maritime Industry's
present, future.



00 PRODUCT
20 PREVIEW:
The Hamburg Show is a traditional product and service launching pad for companies in the maritime industry. Read up on some of the new offerings to be found on the show floor.

German Maritime Review

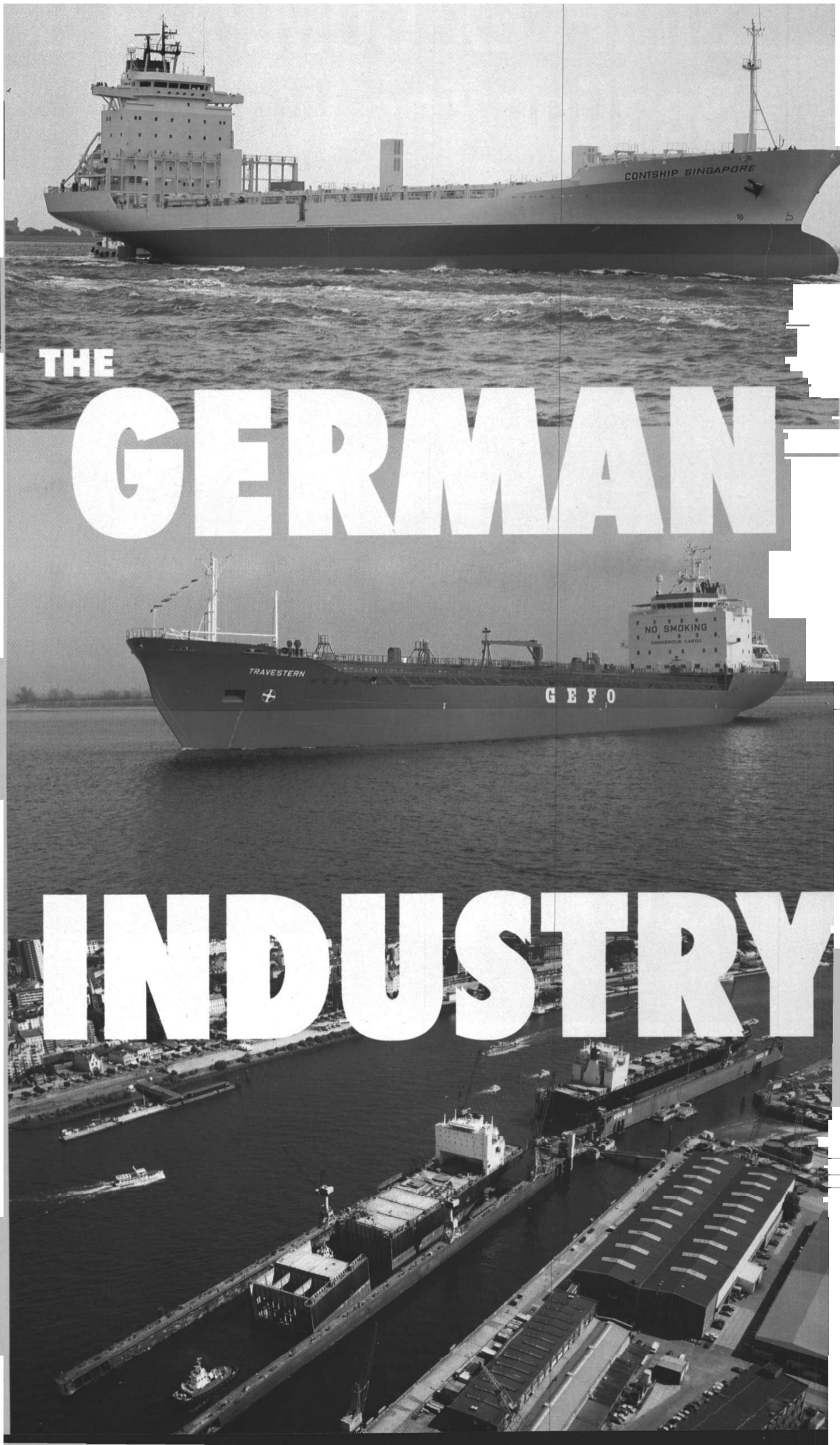


Building specialty ships and investing in technology help give yards & manufacturers a needed edge.

££ SMM '94 Preview

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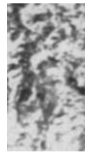
Marine Propulsion
Technology Update —
by Graeme MacLennan



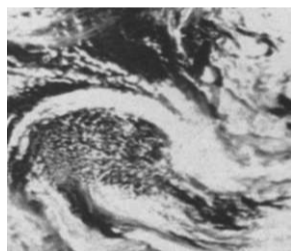
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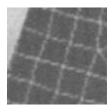
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EDITORIAL

State Of The German Shipbuilding Industry

By

Ulrike Nieter

Verband Fur Schiffbau und Meerestechnik E.V. (VSM)

Observers of international economical developments note with surprise that German industry is in better shape than most of them had expected a year ago.

As in 1992 the full impact of world-wide recession reached Germany, it was with some two years' delay, since in the wake of the reunification of the country, national demands concealed the declining growth in the world economy and compensated for reduced exports. When in 1993 German industry realized its deficits in international competitiveness — due to an overall low productivity, degraded standards of R&D, expenditures and fading innovation — international competitors had already, for two years, been working on their economic recovery. The public debate in Germany was determined by concerns that with lingering political support, high environmental impositions, increasing public rates, the high level of labor costs and complex tariff regulations, it would take more than just better market conditions for German industry to regain international competitiveness.

This view, however, seems to have been too pessimistic. Indications are that world economy is recovering, and rising export orders have created a more optimistic view throughout German industry and put an abrupt end to the weary discussion of the Federal Republic as a generally uncompetitive location for industrial production.

In major industrial branches first data on their expected 1994 performance have been released, announcing remarkable reductions of costs and an increase of productivity that brings in range the standard of their Far East competitors. In other branches (i.e. the aerospace and the chemical industry or important segments of the machine building industry) leading companies have accommodated their corporate structures and policies to the market conditions and have announced that their orderbooks are filled better than ever expected.

The German shipbuilding industry may also take an optimistic view into the future. Its starting position, however, seems to have been



Ulrike Nieter

better than the prospects of other industrial branches. The German shipbuilding industry has operated for more than two decades under market conditions which were in particular influenced by industrial targeting policies of Japan and South Korea. While strained conditions of a free market caused former shipbuilding nations to disappear from the merchant shipbuilding market, German shipbuilders managed to rank number One in Europe and number three in the world.

The major German shipbuilding companies stayed in shape, keeping a leading position in important segments of the shipbuilding market, primarily in segments of a highly technological nature.

Facing steadily expanding world trade and the fact that the ships of the world fleets are over-aged to a large extent, the shipbuilding market is expecting a distinct phase of growing demand for new ships.

There is another dimension, however, to the important role that German shipbuilding industry will have to accept in the future.

As the maritime environment offers mankind a large number of solutions in the fields of international security, foreign trade, transportation, environmental problems and the exploration of resources, shipbuilding as the core industry of all maritime economy is to become a branch of significant political importance and extraordinary eco-

nomical chances for future tasks and developments.

For this reason, and with the manifold and intertwined areas of activity of the maritime industry and other political and economical fields in mind, the German shipbuilding and ocean industries have suggested that a coordinator for maritime matters within the German Ministry of Economics be appointed and a similar field of responsibility within the commission of the EU in Brussels be installed.

The overall bright picture into the future, however, is overshadowed by the building up of excessive, superfluous shipbuilding capacities. Especially in South Korea, the second largest shipbuilding nation in the world after Japan and before Germany, newbuilding capacities are built up on a large scale.

Within the frames of South Korea's "new industrial policy" (socio-economic development plan 1993-1997), shipbuilding, along with the aeronautics/space and automobile industries, is one of the 15 target industries which in part are supported with direct subsidies from the South Korean government. The expansion of the Korean shipbuilding capacities is directly aimed at the Japanese and West European shipbuilding industries in order to gain an even larger market share, and may well be the start to a new round of ruinous competition.

Furthermore, today's shipbuilding capacities are enhanced by the conversion of naval shipbuilding yards into newbuilding facilities and, last but not least, by increased productivity in the existing shipyards.

Before this background it can be expected that the assumed increase of the demand for new ships will not necessarily ease global competition. The German shipyards, therefore, will continue their attempts to reduce costs by further rationalization. Besides this, the industry is taking pains to improve the internal structure of the companies, increase efforts in the fields of R&D, strengthen innovation, integrate inexpensive external capacities in the manufacturing process and find new forms of cooperation among the shipyards.

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ON PAGE 25: Pictured on the special German Industry inside cover are, from top to bottom: the *Contship Singapore*, a containership built by Schichau Seebeckwerft; the chemical and oil tanker *Travestern* type COT 20 from MTW Schiffswerft GmbH; and Blohm + Voss' conversion of the *Sea-Land Value* and the *Sea-Land Pride*.

SMM '94 Product Showcase

SMM '94 — The Hamburg Show — is a traditional venue for maritime companies to launch new products or services. This year is no exception. Throughout this special section is information on a variety of companies' plans for Hamburg.

Injection Pump & Valve Technology On Display

L'ORANGE, with a representative cross-section of its most important high-pressure injection pump and valve designs, will provide information on the latest developments in the field of fuel injection technology at SMM '94. L'Orange also develops injection systems designed to meet specific require-

ments, including pilot injection and dual fuel systems. In its effort to provide injection systems with exacting requirements, L'Orange uses the latest technological tools in the development phase, including simulation models and CAD; as well as the employment of advanced measuring techniques during the development and test phases. In Hamburg, L'Orange will show spare parts for the injection systems of the most reputable engine manufacturers, as

well as testing and assembly equipment for injection system service and repair purposes.

For more information on L'Orange
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STN-Atlas Elektronik Merging Interests

An Atlas NACOS navigation command system which will be featured at SMM as part of a new Ship Control Center.

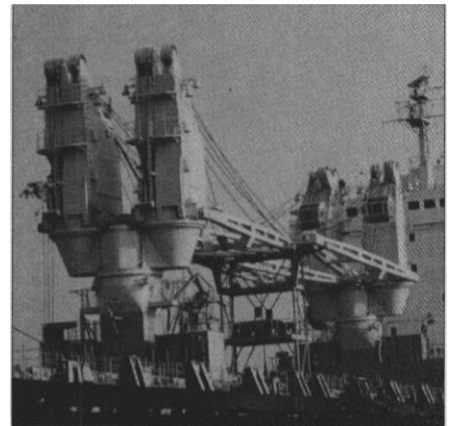
STN-ATLAS ELEKTRONIK, the two leading Bremer Vulkan companies which are in the course of merging their respective interests, will

feature a new concept in ship automation, the Ship Control Center, at SMM '94. The system functionally integrates navigation, engine control and communications functions as part of a single package solution for ships' bridges, covering all supply, installation and servicing requirements. The concept incorporates the Atlas NACOS series of navigation command systems.

Hydrographic survey exhibits include recent extensions to the Atlas DESO series of echosounders, as well as the Hydromap system for processing, display and management of bathymetric data and production of charts.

For more information on Atlas Elektronik
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East Meets West



Double Crane Type EH 2 x 25-22.

KGW Schweriner Maschinenbau GmbH is a manufacturer of cranes, windlasses and winches, and other marine engineering products. Boasting more than 45 years of mechanical engineering experience, the company has become one of the largest suppliers of marine equipment in the east of Germany, and has forged many partnerships with shipyards in other countries. With a product line targeting ship operations, cargo handling and fisheries, KGW, since it was founded, has supplied more than 10,000 anchoring, mooring and warping systems; more than 4,900 steering engines; more than 5,500 cranes and hoists; more than 9,900 cargo handling winches; and more than 6,200 winch systems for fishing operations.

For more information on KGW
Circle 23 on Reader Service Card

RCCL Selects MAN B&W Four-Stroke Engines For New Ship

MAN B&W V 48/60 four-stroke engines were selected by Royal Caribbean Cruise Line (RCCL) of Miami, Fla. for propulsion of its new cruise ship contracted with Kvaerner Masa Yards. The four 12-cylinder engines will develop an aggregate output of 68,500 hp (50,400 kW) and will be the core of the diesel-electric propulsion system. The 1,950-passenger ship is scheduled to be commissioned in November 1996.

For more information on MAN B&W
Circle 36 on Reader Service Card

Blohm + Voss Shortens Sea-Land Ships, Gels QE2

A technically demanding contract was signed by Blohm + Voss in March, a contract which calls for the shortening of three Sea-Land Atlantic Class Vessels (ACV), the *Galveston Bay*, *Sea-Land Value* and *Raleigh Bay* (see photo, page 25).

Each of the ships are being shortened by three midship sections, and more importantly, are being given a new, streamlined bow structure. With the help of Hamburg Shipbuilding Research Institute (HSVA), which was involved in the hydrodynamic calculations and

planning of the work, the design will make each ship three knots faster, raising the speed from 18 to 21 knots.

The additional speed will also be the result of an additional 4,000 kW of power provided to the propeller shaft, power supplied by a diesel generator and to the drive train via an electric motor and a gear coupled to the propeller shaft.

Blohm + Voss recently won another high-profile contract of late, tapped by Cunard Line to renew and modernize the *QE2*.

Expected to be in the yard from

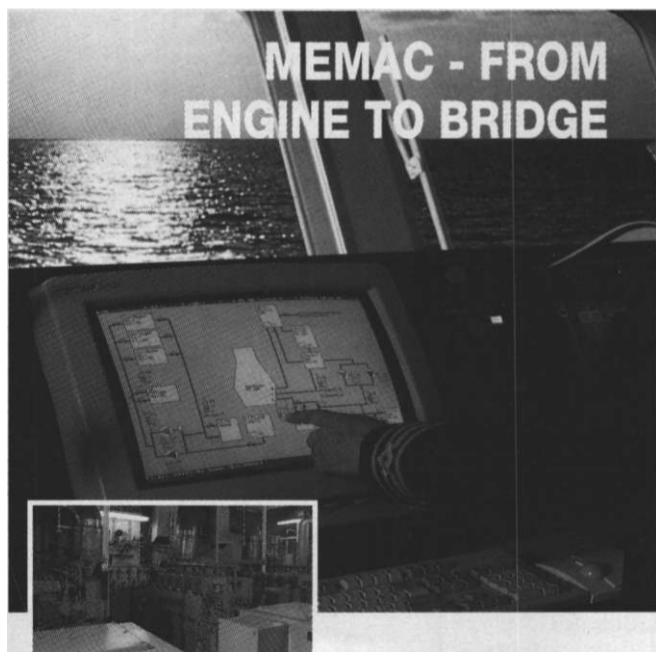
November 20 to December 14, the renewal will total around \$45 million for the yard.

On the newbuild side, Blohm + Voss has dedicated considerable attention to the fast transport market, with SES and Fast Monohull designs.

Particular effort has gone to making these designs more efficient and stable than the many competitors currently on the market.

For more information on
Blohm + Voss
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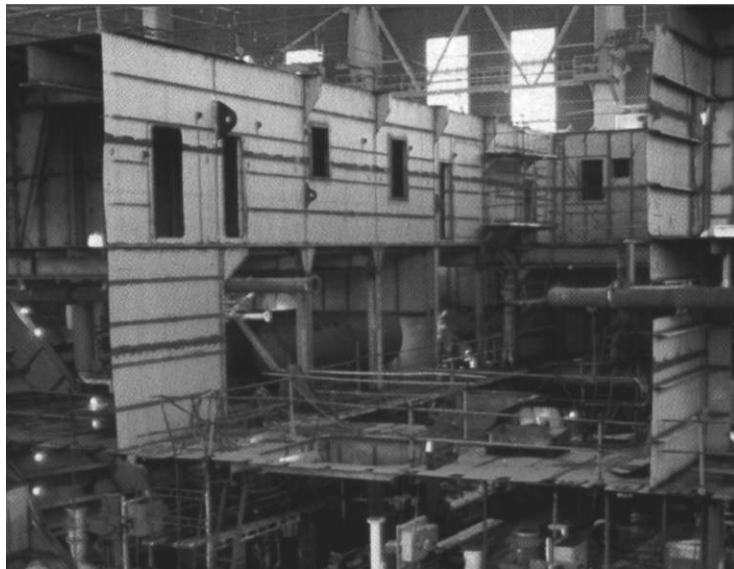
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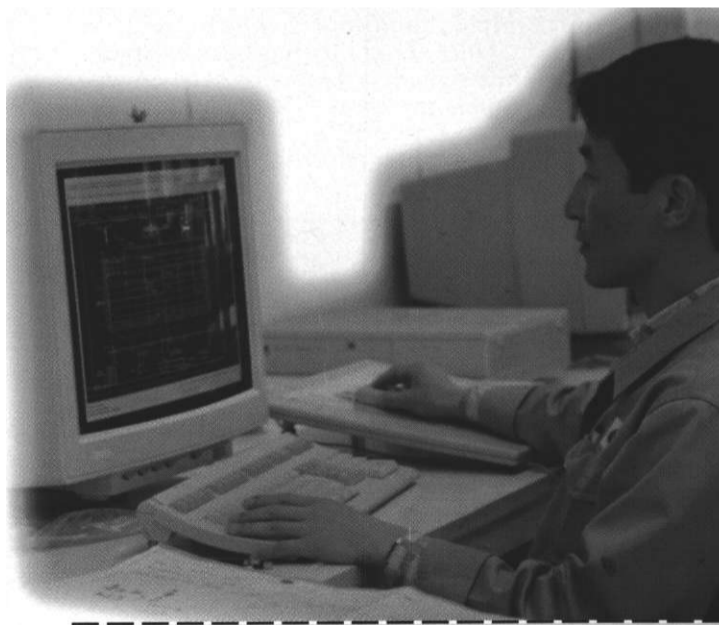


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The German Maritime Industry

Although the overall market share is small (four percent based on gt; seven percent based on cgt worldwide), the German shipbuilding industry is number one in Europe and number three in the world. German shipyards are specialists in building high-tech container vessels and passenger-carrying ships. Their designs are circulating around the world and influence market needs worldwide, as they have done with container vessels.

German shipowner Hapag Lloyd, for example, was the first who asked for ships in the Panamax-breadth of 105.6 ft. (32.2 m), to carry 11 containers side by side in the holds instead of 10. The carrying capacity of vessels of nearly the same shape was increased by about one third only by optimizing designs. But unfortunately German yards were too expensive to build these ships, and Hapag Lloyd ordered the ships at Korean yards. This one case embodies the challenges of German shipbuilding today: the Germans can deliver highly sophisticated designs, but these designs are not always price competitive to build. To receive orders they need some capital aids from the government, which are delivered in various forms.

Thus, the question often asked is: what would happen if these subsidies were canceled?

It was always claimed that German yards need governmental capital aid to reach the same price level as competitors in, mainly, the Far East. But it was also said that German yards could live without subsidies, if all others would do the same. As of late this spring, Dr. **Heinz Ache**, chairman of VSM, was not so sure that the industry would be able to survive without subsidies: "It comes a little bit too early for us. We are just now in the middle of a new restructuring round of getting better productivity."

But in the middle of July it happened in Paris. Negotiators from the European Union, the U.S., Japan, South Korea, Finland, Norway and Sweden agreed on an international treaty to eliminate shipbuilding subsidies.

Although the signing ceremony of the treaty is due to take place this October, if the draft text passes safely through the armies of lawyers from the individual governments and the legal department of the Organization for Economic Cooperation and Development (OECD), it can be assured that a new era of building and financing shipbuilding contracts is coming.

Once the treaty has been ratified and signed, it is due to take effect from January 1, 1996. From that date, signatories of the treaty should be removing all direct and indirect

subsidies to shipyards.

The OECD members covered by the agreement accounted for 75 to 80 percent of the world's shipbuilding production capacity, but are they all really willing to follow the treaty? In Europe opposition came mainly from France. The accommodation of the Jones Act into the agreement has provoked a strong French response, reportedly directed by French President **Francois Mitterand**, and which theoretically may have the power to kill the European Union's ratification by the use of its veto.

Basically, German shipbuilding officials are not against this OECD treaty, but they are warning that the treaty is not clear enough, that shipyard expansion plans in South Korea were not discussed, and that some of the main low-price shipbuilding nations are not covered by this deal. There are some shipyard chief executives who believe that the Germans should strongly oppose these OECD ideas.

GERMAN SHIPYARDS: A STATUS REPORT

Although the orderbooks of German shipyards showed a small increase compared to the end of 1992, the employment of capacities varies substantially from shipyard to shipyard. Whereas some shipyards are

fully booked, small and medium-sized yards especially are suffering from a lack of orders. The ordering behavior of German owners — who again placed a large part of their orders at foreign shipyards, especially in East Europe and the Far East — contributed to worsening the situation.

Privatization of East German yards has been finalized. Now, in order to build competitive companies, the restructuring process is under way. This is taking place in accordance with the directives of the EU Commission concerning the level of maximum subsidies allowed, as well as capacity reductions. As all of these regulations were fixed and made public, the whole restructuring process for East Germany is more transparent in comparison to other cases. But internationally some European shipbuilding nations, especially Denmark, and nationally some small West German yards, are opposing these restructuring plans. The chief complaint is that the East German yards are building new facilities with governmental subsidies (subsidies not available to all) and the result will be stiffer competition from these modernized yards.

Because of the restructuring and capacity reductions, the workforce of East German shipyards has been reduced from 14,500 to 11,100 employees. In 1995, this number should

Meyer Werft: The New Old Yard

Praised by colleagues in the German shipbuilding industry for its efficient, quality operation, Meyer Werft has been in business since 1795 — but has since 1975 been building a completely new shipyard, and most of the plants on-hand today were installed only in the last decade.

The yard has a varied product history known for its production of highly sophisticated ships, particularly luxury car and passenger ferries, passenger vessels, and RoRo ships.

Currently Meyer Werft is building three 70,000-gt cruise vessels for Celebrity Cruises, for delivery in 1995, 1996 and 1997; the 67,000-gt cruise vessel *Oriana* for P&O for delivery in Spring 1995; and a 6,000-gt passenger ship for the Republic of Indonesia for delivery in 1995.

Its current orderbook will supply full employment for the yard's approximately 1,800-person workforce until the spring of 1997.

Meyer Werft offers what is reportedly the world's largest covered

building dock, which allows the building process to be undisturbed by weather.

Known for productivity, Meyer Werft touts the following as helping it keep up with international competitors: CIM/CAD; short distances throughout the shipyard; inventories management systems with container depot (computerized); just-in-time deliveries; close cooperation between subcontractors and shipyard; underwater plasma cutting; and prompt decision making.

To help gain and maintain a technological lead over competing countries, Meyer Werft plans the development of productivity-enhancing methods, such as new welding techniques and process-oriented production.

Also planned are further technical developments of products, such as environmentally friendly propulsion systems with optimized fuel consumption rates, and environmental technologies/waste disposal (Green Ship).

For more information on Meyer Werft
Circle 59 on Reader Service Card



The *Oriana* under construction in the covered building facility

reach 9,000 workers. The employment of West German shipyards decreased from 30,400 to 28,300. The development of exchange rates led to a partial relief of competitive pressure by devaluation of the Deutsche Mark (DM) against the U.S. dollar, the yen and the won, but on the other side the DM rose strongly in value against most of the other European currencies. This led to some contracts going to shipyards in Finland and The Netherlands.

Considering the discussions on the quality of Germany as a suitable location for industries, VSM ordered a comprehensive study on the perspectives of the competitiveness of the German shipbuilding industry. Roland Berger & Partner, the well-known consultants, came to the conclusion that the shipbuilding industry is very efficient and has a leading technological position for sophisticated ships and naval craft. However, the competitiveness is endangered by high labor costs, which keep German shipyards away from bigger markets for vessels such as tankers and bulk carriers.

Thus, to keep the industry competitive for the future, German shipbuilders have to take the following actions:

- intensify efforts to increase productivity
- more outsourcing of production
- more intensive forms of cooperation
- intensification of research and development
- cooperation among the maritime industries within Germany and Europe.

These efforts can only be successful if they are supported by corresponding governmental economic policy.

Some German yards have already taken action. The big yards started campaigns to raise productivity by more effectively motivating employees and by large investments into more effective plants. Howaldtswerke-Deutsche Werft AG (HDW), Kiel created its plan "Shipyard 2000," which is projected to raise productivity 40 to 50 percent. HDW invests in new production methods, cutting and welding lines, semi-automatic panel fabrication, highly automated bloc assembly, complete new corrosion protection and a high grade of pre-outfitting of their blocs. HDW reportedly has and will pay for these improvements from its own earnings.

Yards in Wismar, Warnemiinde, Rostock, Stralsund, Wolgast and Boizenburg are receiving rebuilt, newly equipped plants from the restructuring program of the German government for East German yards. There was a long-lasting fight for privatization and for the final look of the yards. Today West German yards feel strong pressure from East German yards in the daily fight for new orders.

This is partly the reason that 17 western yards are cooperating under a self-formed roof to become more competitive. The yards have joined forces to make investments together they would not be able to make alone. It means that, for example, cutting and welding of plates and profiles is done at one yard, and the assembly of blocs and outfitting to complete the ships is done at another. The yards want to be able to build a longer series of ships in cooperation with different yards.

Bremer Vulkan Group is heavily involved in the privatization of East German yards. Bremer Vulkan became owners of MTW Schiffswerft in Wismar, DMR Dieselmotorenwerk Rostock, Neptun Industrie und Reparatur in Rostock, and part



Finnjet under conversion at HDW in Kiel.

HDW's Shipyard 2000 Plan In Full Swing

Another yard touted for its advanced approaches to design and construction, HDW of Kiel has vigorously implemented changes in its yard to make it more competitive and cost-effective.

Its "Shipyard 2000" plan is projected to raise productivity 40 to 50 percent. HDW has invested in the modernization of its production shop which, among other things, includes:

two welding robots; environmentally friendly sandblasting and painting shop; as well as new welding and cutting machines.

Among the ongoing work is the Norasia open top containership order. *Norasia Fribourg*, the first ship of this series, was delivered earlier this year.

For more information on HDW
Circle 60 on Reader Service Card

owner of Volkswerft in Stralsund. New production facilities are under construction at nearly all places and Bremer Vulkan management is busy keeping everything under control. In Wismar, plans for a new yard were a bit too big. Final plans call for a smaller, more practical plant on the existing premises.

Bremer Vulkan invested in a 3,800-ton carrying transport lift for its old yard in Bremen-Vegesack. This lift is able to completely shift pre-outfitted heavy blocs from covered building to the drydock, and from normal level down to the blocs of the dock. The lift is overcoming the work of the big gantry crane.

One of the most qualified yards with the best orderbook of all of them is Meyer Shipyard in Papenburg. Meyer Werft has built a very effective yard over the years, with capital improvements made from its own earnings. Meyer Werft has specialized in passenger carrying vessels and gas carriers. Today the yard has four cruising vessels of nearly 70,000-gt each on order. Although Meyer Werft's plant is highly sophisticated, it has the disadvantage of being positioned approximately 25 miles (40 km) away from open waters and the river Ems is less than 19.7 ft (6 m) deep for the time being. Nearly 24 ft. (7.3 m) is

the depth needed for the future, and to deliver the four vessels, of which the first is due for delivery in spring 1995. Recently the decision was made to start deepening the waterway.

DELIVERIES 1993

According to VSM statistics, the shipbuilding results for 1993 are:

- 93 vessels of 966,000 cgt were delivered
- 58 units with 655,000 cgt came from West German yards
- 35 units with 311,000 cgt from East German yards
- 76 vessels with 1,136,000 cgt were on order at the beginning of the year; only 50 percent of the volume of the year before.

Consequently, roughly 67 percent of German shipbuilding is positioned in the West and 33 percent in the East. And although the order situation has changed slightly, it is still not considered satisfactory.

In 1993 German shipyards produced mainly container vessels (51.8 percent), passenger-carrying ships, ferries and RoRo tonnage (26.1 percent), cargo vessels (9.4 percent), special tankers (5.9 percent), offshore supply craft (3.5 percent), fishery vessels (1.7 percent), tugs (1.5 percent) and other floating units. It can be said that German yards have

German Shipbuilding

Production	1990	1991	1992	1993
Ships	118	106	95	93
Tonnage				
1,000 gt	881	928	881	944
1,000 cgt	1,121	1,056	908	966
cgt/gt	1.272	1.138	1.031	1.023
Value in mil. DM	4,592	4,270	4,178	4,863
New contracts	121	104	77	76
Tonnage				
1,000 gt	841	613	887	1,151
1,000 cgt	988	887	830	1,136
cgt/gt "	1.174	1.446	0.936	0.987
Value in mil. DM	4,076	4,244	3,725	5,056
Orderbook	221	200	175	152
Tonnage				
1,000 gt	2,314	1,758	1,722	1,908
1,000 cgt	2,490	1,990	1,866	2,007
cgt/gt	1.076	1.132	1.084	1.052
Value in mil. DM	10,549	9,476	9,037	9,177
Employees	62,681	61,929	49,834	44,271

The German Maritime Industry

specialized in sophisticated vessels, but the grade of sophistication has been going down over the years.

German shipbuilding officials are of the opinion that German yards have to compete for the future also in areas of standard vessels, bulk carriers and big tankers. This is one of the reasons why five European shipyards joined forces to at least design the E3 tanker, a highly specialized, double-hulled and environment-friendly tanker. The first E3 tanker, with an option for a second, was ordered with a Spanish yard.

Another specialty not counted in the official statistics is naval craft. Some big yards count

production for the "grey fleet," as the navy is nicknamed in Germany, as nearly one third of its turnover, whereas some smaller yards (Abeking & Rasmussen, Liirssen) which in the past counted more than 80 percent of its work as naval, count it today as just over 50 percent.

When the unification of Germany occurred, an old enemy was lost, and consequently the navy had to reduce and restructure its needs and plans for new vessels. Building programs for frigates, submarines and mine-sweepers are completely revised or phasing out.

New plans are under discussion but may be delayed beyond the year 2000. But some naval craft have to be built, at least to keep competence

in designing and producing these units in the future.

SHIPREPAIR

The repair activities in 1993 were, again, at a lower level than the year before. The repair volume was unsatisfactory and unevenly distributed, so capacities could not be employed as planned. Competition from East European countries and Scandinavia had a negative impact. Most of the German yards count 10 to 20 percent of their turnover coming from ships' repair and conversion.

Today in Germany it is felt that the time is over to compensate for lack of work in newbuildings by repairing and converting vessels.

But just recently, German yards received some prestigious contracts. Blohm + Voss won the contract to refit the Cunard flagship *Queen Elizabeth II*. There has been keen competition for this work with bids from other German as well as a number of overseas shipyards.

Lloyd Werft carried out the previous extensive re-engining and conversion of the pure passenger ship, which was originally built in 1967. But Blohm + Voss, which last docked the ship late in 1992 following her grounding off the U.S. East Coast, was favored by the vessel's owner. The ship has been stemmed at the yard for late November for a four-week refurbishment period, scheduled to have her back in service in time for the Christmas cruising itinerary.

The Hamburg-based Blohm + Voss shipyard has been prominent in the shiprepair market in recent months, and is reported to be in negotiations with other owners attracted by the innovative conversion work the yard is carrying out for Sea-Land. The unique Sea-Land contract covers the conversion of the large containerhips *Galveston Bay*, *Sea-Land*, *Value* and *Raleigh Bay* by November this year. These ships are being shortened from 949.8 ft. (289.5 m) to 856.9 ft.

Lindenau: Developments On The Containership, Tanker Fronts

Kiel-based Lindenau offers newbuilding, repair, conversion and lengthening, diversification products (as well as steel and engine works), and consulting and engineering services. Lindenau, an efficient medium-sized yard, is able to design and construct newbuildings up to 40,000-dwt, and its product range includes double-hull product tankers, LPG ethylene gas carriers, container-feeder vessels, and special purpose-built ships, to name a few.

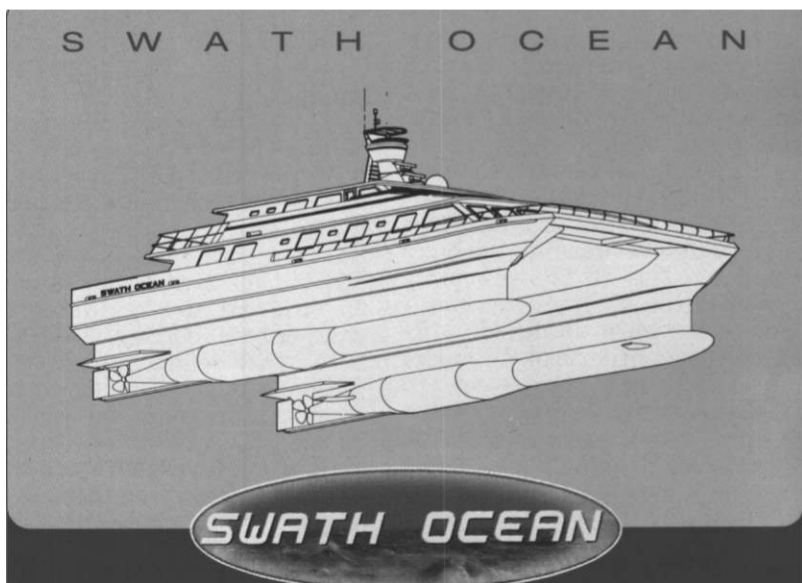
The yard is currently working on an order for two 12,650-dwt, double-hull tankers for the Republic of China. The tankers, which were awarded last September to Lindenau in cooperation with MTW Schiffswerft GmbH of Wismar, are of the Lindenau Tanker Class 2000 type and reportedly meet the latest environmental, safety and economical demands.

On the repair side, Lindenau is equipped with five-ton, 10-ton and 60-ton crane capacities, with

floating docks with lifting capacity of 1,600- and 10,000-tons. Its repair quay is 2,460 ft. (750 m) long. For the first half of 1994, planned capacity for the repair division far exceeded expectations, with three large ship damages repaired and 45 additional repair works carried out through mid-July.

New developments at Lindenau include an investment to widen the building berth, allowing the yard to build double-hull oil and chemical tankers up to 40,000 dwt. Lindenau has also been working on development of high-speed, high ice class containerships from 300 to 1,600 TEU. Finally, in the field of offshore technology, the yard is working on a newly designed offshore safety vessel with naval architect Jurgen **Issleib**, a development which will be presented at SMM '94.

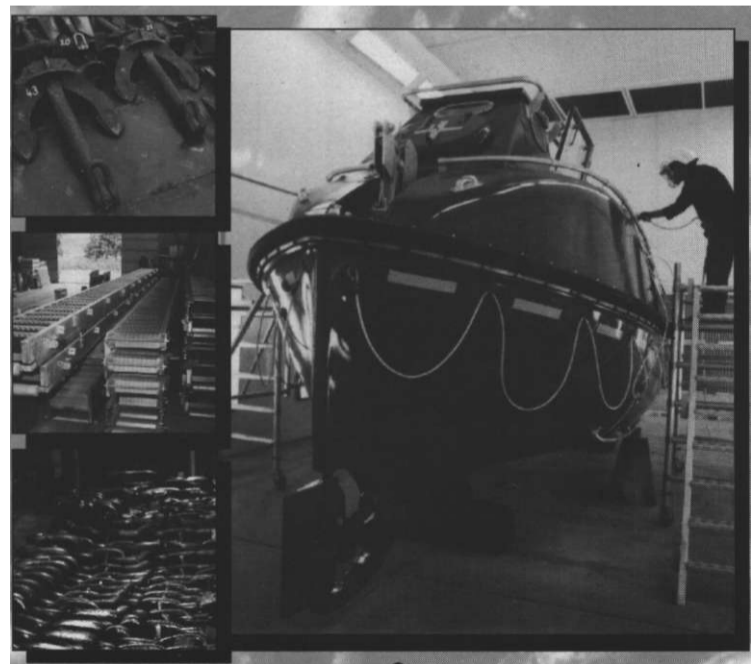
For more information on Lindenau
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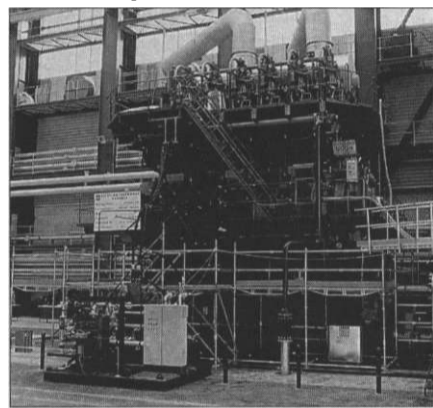
Maritime Reporter/Engineering News

(261.2 m) by removal of 113.5 ft. (40.7 m) mid-body sections. In addition, the bow form is being streamlined and new shaft motors and generators are being installed. The changes mean an increase in speed from 18 to 21 knots.

The yard claims the idea is finding favor with other owners who would like to reduce ship operation costs. The yard said it is also looking at ways to re-use the mid-bodies in new ships. Meanwhile the first co-operative outsourcing venture with Lithuania has been completed, with the delivery of the 21,890-gt large ferry *Kaunas*. This job was carried out in co-operation with Klaipeda shipyard.

German shipbuilding is still working strong to deliver, now and in the future, close to 100 newbuildings with around one million cgt. Main specialties of German yards are still container vessels and passenger-carrying ships, but also standard vessels, bulk carriers and tankers are again planned to be built at German yards.

DMR Ready For Order Upturn



Test run in the new DMR works in Rostock-Warnemunde (engine pictured is 6RTA62U).

DIESELMOTORENWERK ROSTOCK (DMR) is preparing for an expected upturn in business. Its new production facility is capable of building what are touted as the most powerful diesel engines in the world under license from New Sulzer Diesel AG, MAN B&W Diesel A/S and Mitsubishi Heavy Industries Ltd. The DMR stand will also feature products from two of the firm's subsidiaries, Wismarer Propeller-und Maschinenbau GmbH and Mecklenburger Metallguss GmbH. The propulsion equipment from these firms — controllable- and fixed-pitch propellers — enable DMR to offer a complete marine propulsion package.

For more information on DMR
Circle 29 on Reader Service Card

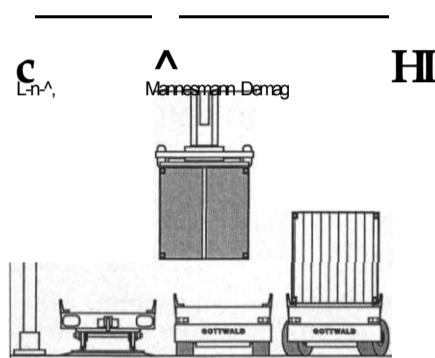
Ports Report Container Traffic Up 45%

BLG, THE PORTS OF BREMEN/BREMERHAVEN, report a 45 percent increase in container traffic to and from Far East/South East Asia and Middle East in the first five months of 1994, compared with last year.

Following the 1993 recession in Germany, container traffic with N.

America is on the rise. In total, 25 container and RoRo lines connect the Ports of Bremen/Bremerhaven with all major ports in N. America. The Bremen ports held a market share of more than 80 percent compared with other German container hub ports. This market position is underlined, according to BLG, by the decision of Lykes Line to establish a second loop to connect the East Coast with Europe via Bremerhaven, although the flag restricted military cargo decreases.

Driverless, Automated Container Transportation



The application potential of the driverless transport systems from Mannesmann Demag Gottwald is not limited to the transshipment of containers.

MANNESMANN DEMAG GOTTWALD recently built and delivered 48 driverless automated guided vehicles (AGVs) for the start-up of the Delta/Sea-Land Terminal at Rotterdam, for container transportation within the terminal area. The new system reportedly presents the largest application of this technology anywhere in the world. The AGVs move containers weighing up to 40 tons.

The computer-controlled vehicles — which Mannesmann Demag Gottwald did most of the development work for — can be coordinated and synchronized with crane movements for optimal performance. They are intended for continuous operation in open areas. Each AGV has its own on-board computer for wireless driving and navigation.

For more information on
Mannesmann Demag Gottwald
Circle 28 on Reader Service Card

Schichau Seebeckwerft Staying Technologically Current

SCHICHAU SEEBECKWERFT of Bremerhaven sees about 80 percent of its yearly business dedicated to newbuilding, with the remaining

percentage dedicated to repair and conversion.

Since 1964 approximately 60 ferries and cruise lines of various types have been built by the yards Schichau Unterweser AG and Seebeckwerft AG, which merged in 1988 to Schichau Seebeckwerft AG.

To ensure the yard stays up to date, it has a complete CAD/CAM training and development center. The center can be used for training of designers and for future development projects.

In 1991 a modernization program commenced, with the building of a completely new organized outfitting and workshop section. The new area includes a data-processed aided central main store with different automatic systems and an allotment terminal with traveling hallroofs allowing for direct transfer of outfit components onboard a ship. There is also a large-scale workshop area for different trades with numerous CNC-regulated plants.

For more information on
Schichau Seebeckwerft
Circle 58 on Reader Service Card

Lift-Dock: To Fit The Needs Of Multi-Purpose Yards

The Lift-Dock system from Schiess Defries is a docking system designed for shipbuilding and shiprepair facilities which reportedly provides fast, safe, productive and flexible service. The system is built to meet all modern requirements of dockyard technology, and new developments are regularly assimilated by design updates.

The Lift-Dock lifting system operates continuously, even with variable loads on the platform. This is accomplished by the electro-mechanical hoisting system with a standardized capacity range from 80 to 400 metric tons. The connection between hoists and platform is made by a high performance rope system, designed specifically for the requirements of the Schiess Defries Lift-Dock system. Schiess Defries offers full supply and installation of Lift-Dock and other systems.

For information on Schiess Defries
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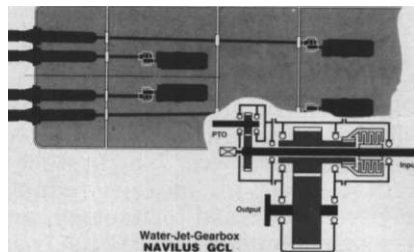


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Navilus GCL Gears Chosen For Fast Ferry Project



Waterjet gearbox Navilus GCL.

LOHMANN + STOLTERFOHT Navilus GCL gear units have been chosen for a Danish passenger ferry to be manufactured by Norway's Mjøllem & Karlsen.

The ship, to be delivered in 1995, will provide 32-knot service between the Danish ports of Grenaa and Hundested.

Powered by four waterjets driven by MTU diesel engines with a total output of 23,200 kW, the Navilus GCL gear units will reduce the engine speed of 1,200 rpm to the speed of the waterjet, which is 548 rpm. The tooth flanks of the gearwheels are case-hardened and ground; all shafts carry an anti-friction bearing.

Integrated multiple-disk clutches allow engagement/disengagement of the gears as desired.

For more information on Lohmann + Stolterfoht

Circle 32 on Reader Service Card

Geislinger: Noise, Vibration Reduction Top Priorities

GEISLINGER, known as a specialist in solving torsional vibration problems, will focus on its Torsional Vibration Dampers at SMM '94. Recently a number of prestigious vessels have been outfitted with this product, including the *Eleo Maersk* built at Odense shipyard and the *Norasia* built at HDW shipyard. Geislinger's product range reaches from camshaft dampers with a diameter of approximately 250 mm to crankshaft dampers for four-stroke engines (GD4), and torsional vibration dampers for two-stroke engines (GD2).

The latter reach diameters up to 11.5 ft. (3.5 m). One GD2 damper will be exhibited on the Geislinger stand in its original size.

The company also plans to highlight its other products and recent developments.

For more information on Geislinger
Circle 25 on Reader Service Card

MTU Powers Prestigious Fast Ferries

MTU provided two 16-cylinder series 595 engines for the highly publicized *Aquastrada I* fast ferry, delivered last year, and has been tapped to provide an identical sys-

tem for the new *Aquastrada II*, a second ferry of the same construction, for Italian operator Tirrenia. The second vessel will carry up to 450 passengers and 120 cars in service between La Spezia and Olbia on the island of Sardinia at a cruising speed of 43 knots.

As with the first vessel, products from MTU-Elektronik will handle a great deal of the data management processes on board.

Among other items, the gas turbine and the diesels are electronically governed and controlled by the ECS engine control system.

For more information on MTU
Circle 37 on Reader Service Card

Fresh Water From The Sea

SERCK COMO GMBH was established in 1841, and has evolved into a company specializing in the development, design and manufacture of heat exchangers and evaporators for the shipbuilding industry.

Today the company offers a wide range of products and services to the shipbuilding and offshore markets, targeting the cruise ship market, among others. Serck Como watermakers are featured on both the *Fantasy* and the *Ecstasy*, converting more than 1,000 tons of sea water into potable water each day.

For more information on Serck Como
Circle 39 on Reader Service Card

Renk Tacke: Low Noise, Smooth Running Gears

RENK UND RENK TACKE will provide details of its latest gearing solutions and delivery programs at SMM '94.

The Renk Tacke Augsburg works recently demonstrated one of its new 30,000-kW gear units for the *Finnjet* ferry to a group of marine experts via a test bed.

According to the company, low noise and smooth running are the behavior characteristics of this special propulsion gear—criteria which are critical to securing business in the burgeoning ferry and cruise liner market.

The latest delivery from Renk Tacke is two gear units for the new P&O cruise liner *Oriana* being built at Meyer Werft.

At 106 tons per gear, they are the largest marine gears built by the Renk Tacke Rheine works to date.

Each father and son gear system transmits a power of 43,000 kW to a controllable-pitch propeller and incorporates a 4,200-kW shaft alternator which can be used as an electric motor.

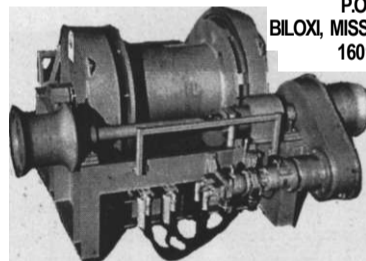
At the Hamburg Show, the company will also provide details on its new gear unit developments for fast ferries.

For more information on Renk Tacke
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Feroform Bearings Installed On Passenger Catamaran

TENMAT, a division of T&N pic., will be exhibiting the complete range of Feroform marine bearing materials at SMM '94. The company's booth will be staffed with personnel including Tenmat's marine bearings distributor for Germany and the Feroform marine bearings product manager. Tenmat's high-performance Feroform marine bearings are used in all classes of seagoing and inland waterway vessels, including naval warships and submarines. The company recently announced that Feroform marine bearings were chosen for the SeaCat catamaran Denmark, a passenger ship operating between Gothenburg in Sweden and Fredrikshavn in Denmark. It was discovered the vessel required new bearings when it made a scheduled stop.

For more information on Tenmat
Circle 21 on Reader Service Card



Containership fitted with Feroform rudder bearings. Tenmat's complete line will be exhibited at SMM.

Krupp MaK Engines Order For Russian Vessels

KRUPP MAK received an order for the supply of the main propulsion plants (including gears) for 18 vessels for the Russian shipping company Liko Promarket. The vessels, 3,000-grt sea-going river tankers, will each have a propulsion package consisting of twin-engine plant; each engine will be of MaK type 6M20, with an output of 930 kW at 900 rpm. The vessels will be built at the Bulgarian yard Rousse Shipyard. Engines will be delivered continuously from mid-1994 to the end of 1995.

For more information on Krupp MaK
Circle 35 on Reader Service Card

Westfalia Products On New 4,422-TEU Ship



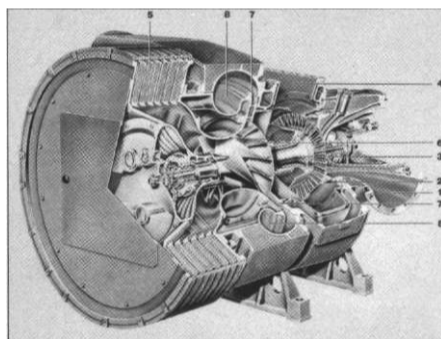
The Samsung Heavy Industry-built *Hannover-Express* features systems from Westfalia Separator.

WESTFALIA SEPARATOR was chosen as supplier for the lube and fuel oil treatment systems for the world's first 4,422-TEU class superlarge containership, the *Hannover-Express*. Four separators equipped with the Unitrol system type OSB 35 will handle the task of treating the fuel oil. The products reportedly ensure high separation efficiency across a wide oil range under extreme conditions. The *Hannover-Express* was built

by Samsung Heavy Industries for Hapag Lloyd.

For more information on
Westfalia Separator
Circle 24 on Reader Service Card

ABB Turbocharger Offers Wide Range Of Propulsion Solutions



General construction diagram of an ABB turbocharger.

ABB TURBOCHARGERS have been manufactured since 1944 in a range of standard models, for a range of gas and diesel engines extending from a rating of 500 kW to about 20,000 kW per turbocharger.

The ABB turbocharger design, with external bearings, has proven its worth in many scenarios, including on marine propulsion engines. As a result of the high efficiency of its modern turbochargers, ABB Turbo Systems has developed the concept of the power turbine, which converts the superfluous energy not needed by the turbocharger into useful energy, which can be fed back to the engine crankshaft or the drive of a generator.

On display in Hamburg will be the latest technological information and updates regarding the manufacturer's vast product and service line.

For more information on
ABB Turbocharger
Circle 38 on Reader Service Card

Schottel: A Leading Maker Of Propulsion Units

SCHOTTEL, a leading manufacturer of azimuthing propulsion units and maneuvering aids, will present examples of its main and auxiliary propulsion systems for all areas of shipping and the offshore industry at SMM '94.

The production program encom-

passes rudderpropellers (SRP) up to 6,000 kW with fixed-pitch and controllable-pitch propellers, pump-jets (SPJ) up to 3,500 kW for main and auxiliary propulsion, transverse thrusters and complete power packages and controls. Also, look for Schottel's new addition to its Navigator range: the Schottel Hydro-Armor (SHA).

For more information on Schottel
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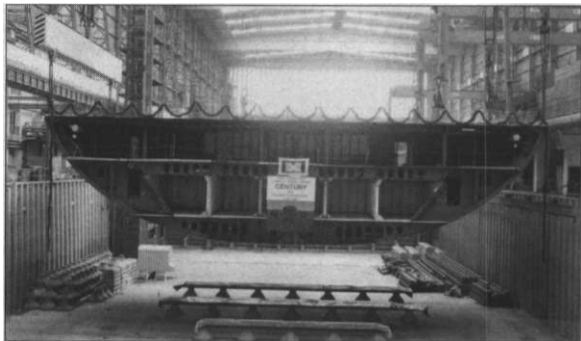
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Circle 265 on Reader Service Card

Meyer Werft Lays Keel Of Cruise Vessel/Century



The first section of the cruise vessel *Century*, under construction at the Meyer Werft Shipyard in Papenburg, Germany, was lifted into place by a 600-ton gantry crane and then lowered down onto the blocks in the covered building dock. *Century* is the first of three 70,000-gt vessels building for Celebrity Cruises, Miami. The first section of *Century* is 65 ft. (20 m) long, 105 ft. (32 m) wide and weighs 530 tons.

When finished, the vessel will be 797 ft. (243 m) long and will have a capacity of 1,750 passengers. The engine output of 29,250 kW will provide the ship with a speed of 21.5 knots.

When *Century* joins the Celebrity fleet it will be the third Celebrity vessel to be constructed at the Meyer Werft Shipyard, following the *Horizon* in 1990 and the *Zenith* in 1992.

For more information on Meyer Werft
Circle 69 on Reader Service Card

Fassmer To Introduce New Generation Of Lifeboats

FR. FASSMER & CO. will introduce its new generation of lifeboats, type SEL 10.5/SEL 11.0 (T) and Compact life and rescue boats, type CLR 7.2/8.5, at SMM '94. After successful type approval under the survey of various classification societies, Fr. Fassmer has won orders for more

than 50 boats, supplying such projects as: the two Carnival cruise ships under construction at Kvaerner Masa-Yards; two ferries for TT-Line, being built at Finnyards; two ferries for Magna Holding, being built at Schichau Seebeckwerft; and a ferry for an Irish owner under construction at Van der Giessen-de Noord.

For more information on Fr. Fassmer
Circle 22 on Reader Service Card

Sperry To Introduce Vision 2 J 00 At SMM

SPERRY MARINE will introduce its new Vision 2100 Integrated Bridge and new

Voyage Management System (VMS-VT) at SMM '94. Vision 2100 integrates the navigation planning station, conning station, radar/ARPA, ECDIS, docking display, engine room monitors and other equipment into a single, automated assembly which can be shipped and installed as a prefabricated and tested unit. The new VMS-VT design utilizes PC electronics with versatile Windows-based application software. The VMS-VT includes complete ECDIS electronic chart capability compliant with IMO requirements and a unique "V" window to display multiple user selectable display windows simultaneously superimposed on an ECDIS chart.

For more information on Sperry Marine
Circle 46 on Reader Service Card

New Sulzer Diesel Selected For OOIL Ships

NEW SULZER DIESEL has been enjoying much success of late, including the order recently to supply the power to six 4,960-TEU post-Panamax containerhips contracted in Japan

and South Korea by Orient Overseas Intl. Ltd. (OOIL). Each ship will be propelled by a 12-cylinder Sulzer RTA84C low-speed diesel engine with a maximum continuous output of 48,600 kW (66,120 bhp) at 102 rpm. The ships will have a service speed of 24.9 knots and will be deployed on the transpacific trade of OOIL's liner operation, Orient Overseas Container Line Ltd. (OOCL). The orders bring to 13 the number of large, fast containerhips delivered or on order with 12-cylinder RTA84C engines. These include five other post-Panamax ships with 12RTA84C engines; two for Royal Nedlloyd Group and three for NYK Line.

For more information on New Sulzer Diesel
Circle 26 on Reader Service Card

Diesel Engine Monitoring Sensors Help With Safe, Economical Operation

KISTLER supplies piezoelectric quartz sensors, technologically advanced products which allow exacting monitoring of large diesel engines. Kistler offers two systems for measuring cylinder pressure: Thin Load Washers for permanent monitoring and the Engine Tester for periodic checking of cylinder pressure. Kistler touts the system as an integral part of offering operators the assurance of safe and economical diesel engine operation.

For more information on Kistler
Circle 31 on Reader Service Card

Racal-Decca To Launch New Products At SMM '94

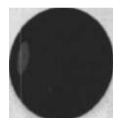
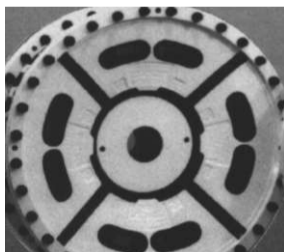
RACAL-DECCA MARINE LTD. will launch a range of new products at the SMM '94 exhibition. A self-proclaimed revolutionary addition to Racal's range of integrated bridge systems now makes big ship advanced technology available to smaller vessels. The MIRANS 1000 and 2000 are designed to meet the needs of smaller craft, including workboats, high-speed ferries, yachts, fishing

RATO-Family

An application oriented programme

RATO-S coupling - Segmental Construction
All-purpose application in main and auxiliary drives.

RATO-R coupling - Ring Element
For application in drives with high speeds and power density.

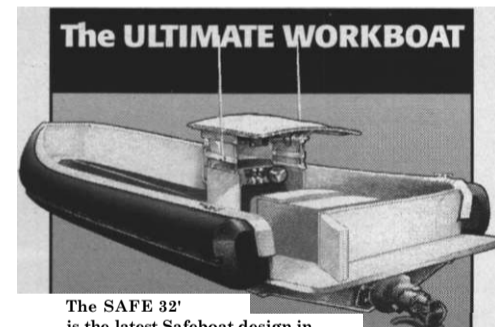


RATO-DS coupling - Element loaded in shear
For rigidly mounted drive systems with low radial shaft misalignments.

RATO-DG coupling - Element loaded in shear
Particularly designed for generator drive applications.



Circle 299 on Reader Service Card



The SAFE 32' is the latest Safeboat design in a family of unique boats from 14' to 48'. Combining features found in no other boat, this Jet powered dive boat is unsinkable and virtually indestructible. The SAFE 32, like all SAFE boats, uses a Patented system whereby a closed cell foam collar is bolted to the welded aluminum hull. Call or write for more information on these fast, stable and extremely SAFE boats!

SAFE 32 specifications
Length over all: 32'
Beam: 10'
Draft: 2'
Capacity: 6400 lbs
Top speed (light): 28 knots
Top speed (heavy): 22 knots
Cruising speed (light): 22 knots
Cruising speed (heavy): 22 knots
Power: 350 h.p. diesel with jet drive

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Circle 208 on Reader Service Card

Maritime Reporter/Engineering News

vessels and oceangoing tugs. The units are touted as suitable for any vessel in need of advanced wheelhouse electronics, but lacking the space to accommodate a conventional integrated bridge system. Also, an addition to the Racal-Decca range of BridgeMaster radars will also be launched in Hamburg. The new 250 ARPA radar has been developed to offer all of the most advanced BridgeMaster features in a compact unit with a 12-in. screen.

For more information on Racal-Decca
Circle 34 on Reader Service Card

Lips To Tout All Around Propulsion Solutions

LIPS, with a reputation as a top propeller manufacturer, will emphasize its role as an all around propulsion specialist at SMM '94.

Lips' involvement with waterjets goes back to 1985 as partner in the joint venture with RivaLips until 1993. Since the establishment of Lips Jets BV in Drunen last year, the waterjets are fully engineered and manufactured under the Lips flag in The Netherlands. The Lips heavy duty waterjet has been proven: 10 wave-piercing catamaran car/passenger ferries, all equipped with Lips waterjets, are being employed 24 hours a day in different waters around the world. The Lips line also includes: monobloc propellers of any diameter; controllable pitch propellers of up to as large as a ship can demand; and bowthrusters as well as azimuthing thruster.

For more information on Lips
Circle 49 on Reader Service Card

HydroComp, HSVA GmbH Announce Alliance

HYDROCOMP, INC. and Hamburgische Schiffbau-Versuchsanstalt (HSVA) recently announced a cooperative relationship, with the shared principal goal to create the industry's most comprehensive source for performance prediction solutions through the mutual representation of products and services.

HydroComp, Inc., known for its NavCad resistance and propulsion software, is a leader in applied hydrodynamics for early-stage design. It is supplying HSVA with advanced copies of the NavCad software for commercial use and cooperative technical development, and is representing HSVA analytical services to clients.

HSVA expects this new relationship to provide NavCad users worldwide with increased access to HSVA's services and expertise. HSVA has been among the world's leading towing tanks since its founding in 1913. It incorporates modern experimental capabilities with numerical methods to provide solutions in ship hydrodynamics, propeller design and ice technology.

For more information on HydroComp
Circle 50 on Reader Service Card

MWH To Focus On Service As Well As Products

Markisches Werk Halver GmbH (MWH), viewing SMM as one of the most important shipping shows in the world, has traditionally geared its exhibit around displays of its well-known product line encompassing engine components.

This year however, according to

Wolfgang Boddecker, MWH will display none of its parts, and instead use it stand in Hall 7 as a communications center/reception area to meet, greet and discuss business with customers and potential customers.

Mr. Boddecker assesses business in 1994 — to date — as compared to 1993. Looking beyond this year, he views MWH's role as changing from an engine compo-

nent product supplier to a product and service supplier. He noted that just 10 years ago, MWH manufactured components to manufacturer's specifications. Today, however, MWH has evolved to more of a business partner. It is more common for an engine manufacturer to look to MWH as the expert, and to expect MWH to provide proposals.

For more information on MWH
Circle 79 on Reader Service Card

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The systems (hardware & software) are certificated by the leading classification societies such as LR, GL, DNV, NKK, ABS, BV and KR. Please ask for more information and demo programs!

Programs:

- * Stability program MXMACS3
- * Container program BELCO
- * Lash program SEALASH
- * Program for Mixed Cargo
- * Program for Inclining Experiment INEX
- * Program for Dangerous Goods DAGO
- * Trimoptimization program TROP
- * Damage Calculation program DAST
- * RORO program
- * Grain program
- * Program for tanker
- * Bulk Carrier Load Limits program
- * Shipmanagementprogram PERMON
- * Spare Parts program

* Saving time by support of loading and discharging disposition

* Saving money by support of loading and trim optimization

* More safety by calculating stability and strength

* Good clarity due to optimum display and clean print-outs

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SMM '94

The Hamburg Show

The Shipbuilding Machinery & Marine Technology Exhibition & Conference (SMM '94) — scheduled for Sept. 27 to Oct. 1 in Hamburg—is a leading international show which will attract an estimated 32,000 visitors from 49 countries.

The exhibits portion of SMM '94 — consisting of 750 exhibitors from 26 countries exhibiting within 48,000-sq.-m. arranged in 12 halls — includes representatives from the shipbuilding industry, shipyard installations and equipment, engines and propulsion systems, electrical engineering and electronics, pumps, compressors, fittings and auxiliary machinery, cargo handling and transport systems, and just about every other product sector imaginable.

Included among the countries which will have "official national participation" are: Canada, the Czech Republic, Denmark, Finland, France, Hungary, Italy, Japan, The Netherlands, Norway, Poland, Russia, South Korea, Spain, Sweden, the U.K. and the U.S.

Held every two years, SMM is regarded as a leading international exhibition of shipbuilding and shipbuilding technology.

Hallmarks of each show are new trends and developments in the shipbuilding industry, presented by industry leaders to a specialized international audience.

The following is the schedule for speakers at the SMM '94 conference, SEA 2000.

PORT ENVIRONMENT INFORMATION SYSTEM

Provides authorities, pilots and captains with real-time information about weather and sea conditions. Data is available on screen and as a voice message on marine radio or by telephone.

Automatic Weather Stations measuring:

- wind speed
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- temperature
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- current speed and direction at 6 levels
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SEA 2000 — The Conference

The SMM '94 conference — SEA 2000 — is comprised of a list of speakers who will discuss analyses of logistic concepts and market developments in specific geographical regions. The conference will present transport technology and future ship design concepts in coastal trade and optimization of interface between port facilities and ships cargo handling equipment. The following is SEA 2000's most updated schedule.

Wednesday, September 28

9 a.m. Welcome — Prof. Dipl.-Ing. **Fritz Sandmann**, Conoc, Hamburg
Opening Address — Prof. Dr. **Erhard Rittershaus**, Mayor, Hamburg
Tadao Yamaoka, chairman, Japanese

Marine Equipment Assoc.

9:25 a.m. "Short Sea Shipping" — Dr. **Wim A.G. Blonk**, director, shipping & ports, directorate VII Transportation, CEC Brussels

9:45 a.m. "Future European Short Sea Shipping Seen from an Active Shipowner's Point of View" — **Gunnar Jacobsen**, president, Jebsen Wilson Eurocarriers Norway

10:05 a.m. "Interface Port in Intermodal Transportation" — Dipl.-Ing. **P. Dietrich**, chairman, the Federal Assoc. of German Seaport Operators

10:25 a.m. "The Shipbuilding Industry's Role in the Modal Shift" — **Carlos M. de Albornoz**, chairman of AWES

SESSION 1: Short Sea Shipping — Logistics

11:15 a.m. "Logistics Concepts & Market Development in the European Coastal Trade" — Prof. Dr. **M. Zachcial**, Institut für Seeverkehrswirtschaft und Logistik, Bremen

11:35 a.m. "Japanese Logistics in Coastal Trade" — Prof. **Takehiko Sugijama**, Hitosubashi Univ.

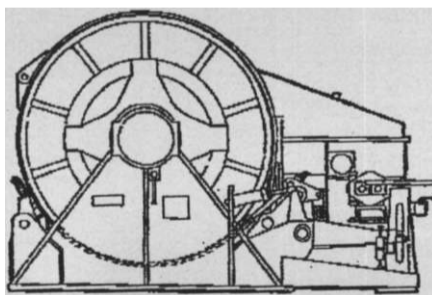
11:55 a.m. "Intermodal Combined Passenger & Cargo Transportation" — M. Sc. (Nav. Arch.) **Markku Kanerva**, Delta Marine, Finland

12:15 p.m. "Electronic Data Interchange for Multimodal Transportation" Dipl.-Ing. **J. Koock**, AEG Automatisierungstechnik, Frankfurt

SESSION 2: Short Sea Shipping — Techniques

2:00 p.m. "The Japanese Proposal — The Techno-Superliner" — Dr. **Kazuo Sugai**, Assoc. of Techno-Superliner, Tokyo

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2:25 p.m. "The German Proposal — Fast Monohulls & Large SES for Specific Applications" **Heinz Topel**, Blohm + Voss, Hamburg

2:50 p.m. "The Italian Proposal — Future Ship Design Concepts for World Trade" Dir.-Ing. G. **Arena**, Fincantieri, Italy

3:15 p.m. "The Scandinavian Proposal — Ship Design & Cargo Handling for Short Sea Shipping" **Kai Levander**, Kvaerner Masa-Yards

3:40 p.m. "The Spanish Proposal — New RoRo Ship Design for Faster Port Turnaround in Unitized Short-Sea Trades" **Juan Calvo**, AESA, Madrid

5 p.m. Presentation of the results of universities' competition on Futuristic Ship Concepts

Thursday, September 29

From Sea Chart to a Hydrographical Information System — Data Processing, Evaluation and Presentation

9 a.m. Welcome — Dr.-Ing. **Heinz Gizzas**, Strom und Hafenbau, Hamburg. Chairman: **Horst Hecht**, Bundesamt für Seeschifffahrt und Hydrographie, Hamburg

9:30 a.m. "Hydrographie & Geographic Information Systems for Ships - Requirements and Development Trends" — Dipl. Ing. **Hubertus Wentzell**, Atlas Elektronik, Bremen

10 a.m. "Geographical Data Bank as Central Unit for a Hydrographical Information System" — Dr. **Matthaus Schilcher**, Siemens Nixdorf, Munchen

11 a.m. "Data Acquisition & Evaluation Procedures for a Hydrographical Information System" — Dipl.-Ing. **H. Jorg Geerke**, Hamburg Port Consult, Hamburg

11:30 a.m. "Main Marine Information Sources, Relevant for Planning" — Prof. **Peter Andree**, Polytechnic, Hamburg

12:00 noon "Ships for Special Survey of Waterways" — Dipl.-Ing. **Siebeneicher**, Wasser-und Schifffahrtsdirektion Nord, Hamburg

1:30 p.m. "HYDROCAD - A Hydrographical Information System for the Port of Hamburg" — Dipl.-Ing. **Dieter Seefeldt** & Dipl.-Ing. **Kai Wessel**, Amt für Strom- und Hafenbau, Hamburg

2 p.m. "Hydrographical Survey in Finnish Skerries" — **J. Nuoteva**, Hydrographical Service, Finland

3 p.m. "Hydrographie Survey for Harbor Maintenance & Support Shipping" — **A.C. Noordijk**, Port

of Rotterdam-Hydrographic Dept.
3:30 p.m. "Electronic Sea Chart (ECDIS) — A Realtime Navigation & Information System" — Dipl.-Ing. **Horst Hecht**, Leitender Regierungsdirektor, Bundesamt für Seeschifffahrt und Hydrographie, Hamburg

For additional information on SMM '94, contact: tel: +4940 35690; fax: +4940 3569 2180.

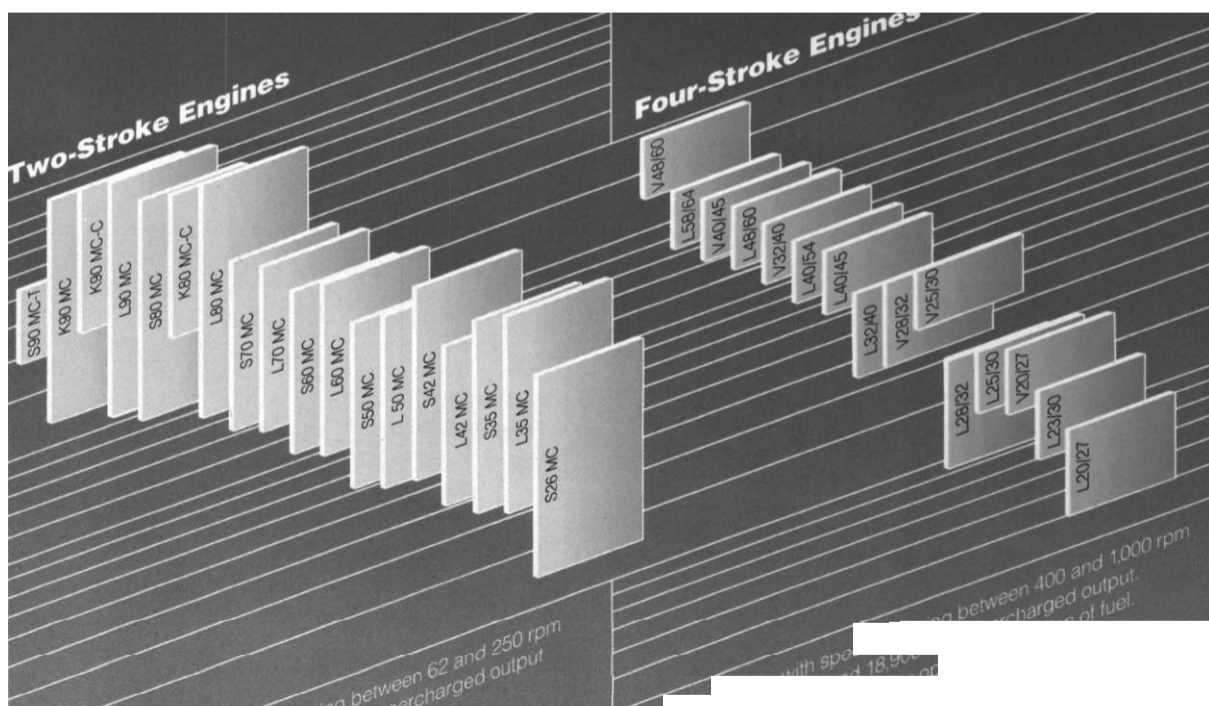
Norwegian Stand At SMM To Feature 39 Companies

Thirty-nine Norwegian maritime companies will participate in the Norwegian pavilion "Norway, Your Maritime Partner" at SMM '94. Organized by the Norwegian Trade Council, Norway's stand will feature elements of the old Hanseatic city of Bergen to illustrate the historic commercial links between

Hamburg and Norway's second largest city.

The Norwegian pavilion will focus on such themes as safety, marine environmental protection and quality management.

Norway will also be heavily involved in the Sea 2000 conference, which will cover themes such as "Short Sea Shipping" and the challenges it presents to European politics and the maritime industries.



N f a n

Unger Named President Of Raytheon Marine Company

Robert Unger has been named president of Raytheon Marine Company. In his new role, Mr. **Unger** has worldwide responsibility for the company's manufacturing, sales, marketing, service, and product development activities.

The new president, who reports

to Dr. **Philip W. Cheney**, group executive for Raytheon's commercial electronics group, joined Raytheon Marine in 1981 as director of marketing.

Based in Copenhagen, Denmark, he was responsible for developing the sales, distribution, and service networks for Europe's recreational and commercial fishing markets.

Dr. **Cheney** said Mr. **Unger** brings "operational and leadership

skills to the task of strengthening Raytheon Marine's preeminent global position in marine electronics."

Mr. **Unger** comes to Raytheon Marine from another Raytheon affiliate, Chicago-based Sorenson Company, where he had been president since 1983.


Raytheon Marine Company, headquartered in Hudson, N.H., manufactures and sells products under three brands — Apelco,



Robert Unger


Autohelm, and Raytheon — for the recreational boating, commercial fishing, merchant shipping, and government markets. Raytheon Marine products are sold through the North American headquarters and Raytheon Marine Europe, based in Portsmouth, U.K.

For more information on Raytheon
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Topsoe cleans the air

At sea

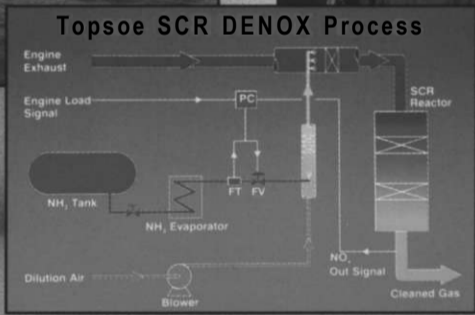


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Topsoe SCR DENOX Process

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WJT


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The design of the SCR DENOX units is based on Topsoe proprietary catalyst series DNX, featuring modular monolithic structure, high NO_x removal activity, high tolerance to contamination, low oxidation activity, low pressure drop, low weight and especially designed to withstand heavy exhaust pulsations and engine vibrations.

Haldor Topsoe A/S also has catalyst and know-how for removal of CO and HC from diesel engine and gas turbine exhaust gases.

For more information, please call or write:

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Haldor Topsoe A/S
Equipment Division
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North American Office:
Haldor Topsoe Inc.
17629, El Camino Real
Houston, Texas 77058
Phone: +1-713-4802600
Telefax: +1-713-4803371

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New Sulzer Diesel U.S. Moves Office

New Sulzer Diesel U.S. Inc. recently moved its offices to Newport Tower in Jersey City, N.J. **Marcus Johnson**, **Ernst P. Jung**, **Josef Boeni** and **Kurt Albrecht** can now be reached at the Jersey City office.

The new address is: New Sulzer Diesel U.S. Inc., Newport Tower, 525 Washington Boulevard, Suite 2408, Jersey City, N.J. 07310; tel: (201) 217-9300; fax: (201) 217-1312. For direct service, contact: Spare Parts Inquiries/Service Engineering at tel: (912) 748-2400.

Crowley Makes Executive Promotions & Elections

The board of directors of Crowley Maritime Corporation announced the election of **Thomas B. Crowley, Jr.** as its chairman and CEO, filling the positions left vacant by the passing of his father, **Thomas Crowley Sr.**, on July 7.

The board also announced the election of **Molly Murphy Crowley**, widow of the deceased Mr. **Crowley**, to the corporation's eight-member board. Mr. **Crowley, Jr.** will also continue in the positions of president and chief operating officer of the holding company.

Crowley also recently announced that **Raul Iglesias**, named general manager, Caribbean Services in the recent Crowley executive restructuring, has been promoted to the position of vice president, Caribbean Services for Crowley Marine Services' (CMS) subsidiary, Crowley Towing & Transportation Company of San Juan, Puerto Rico.

Mr. **Iglesias** has overall responsibility for Crowley's contract transport activities in Puerto Rico and the Caribbean. These activities include oil transportation, contract towing, ship assist, marine salvage, rescue towing, environmental services (oil spill response, cleanup and containment) and bunker fuel sales.

Stacker Departs Shipbuilders Council

John J. Stocker, chairman of the Shipbuilders Council of America (SCA), departed the SCA as of August 3. **Sila O. Nunn**, SCA vice president, was named acting president, effective immediately.

Ole Skaarup, chairman of the U.S. Shipbuilding Corporation (USSC), Inc., has reportedly confirmed that Mr. **Stocker** will join USSC, a joint venture formed earlier this year between Shipbuilding Ventures, Inc. and McDermott Shipbuilding, Inc.

Mr. **Skaarup** said he and his McDermott partners were delighted Mr. **Stocker** will join USSC later this year to assist its efforts to revive the U.S. commercial shipbuilding industry, but declined further comment until arrangements have been finalized with Mr. **Stocker**.

Collar, Johnston Join ZF Industries Marine Div.



Gary L. Collar

Ken Johnston

Gary L. Collar and **Ken Johnston** have joined the Marine Division of ZF Industries as manager - marine and account manager, respectively.

Before joining ZF, Mr. **Collar** was president and CEO of Pantropic Power Products, Inc., Miami, Fla. In his new position, he will have overall responsibility for the sales of ZF marine transmissions.

Mr. **Johnston** comes to ZF from Johnston and Towers, Inc., Mount Laurel, N.J., where he was a sales engineer. He will be responsible for marine transmission sales in the Northeast.

ZF Industries, a division of ZF Friedrichshafen AG of Germany, markets transmissions, axles, steering gears, and other components for marine and other industries. The corporation's sales offices and engineering center are located near Detroit.

Burker Named Director At SPD Technologies

Harry S. Burker, Jr. was elected a director of SPD Technologies, Inc.

Mr. **Burker** currently serves as president of EXECU-COM, Inc. of Inverness, Ill., having launched the company in 1991. He did this after retiring from Siemens Energy & Automation, Inc., where he was president and CEO, as well as a director. Previously, he was group executive of Siemens Energy and Automation.

Mr. **Burker** is on the board of directors of Medalist, Inc. of Milwaukee, Wis. and a former member of the board of governors of the National Electric Manufacturers Association.

SPD is a major producer of military circuit breakers and switchgear and a leader in the development and manufacture of high-reliability shipboard systems, as well as ship overhaul and repair services. Headquartered in Philadelphia, the com-

pany has operations across the nation and serves military markets worldwide.

O'Neil Elected To Royal Academy Of Engineering

William O'Neil, secretary-general of the International Maritime Organization (IMO), the United Nations agency concerned with

maritime safety and the prevention of pollution from ships, has been elected a member of the Royal Academy of Engineering. His election was announced at the Academy's annual general meeting on July 19.

Mr. **O'Neil** has been commissioner of the Canadian Coast Guard and president and CEO of the St. Lawrence Seaway Authority. He became chairman of the IMO Council in 1980 and was re-elected four times.

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- Specialty Elastomeric Materials
- Composite Plastic Marine Piling



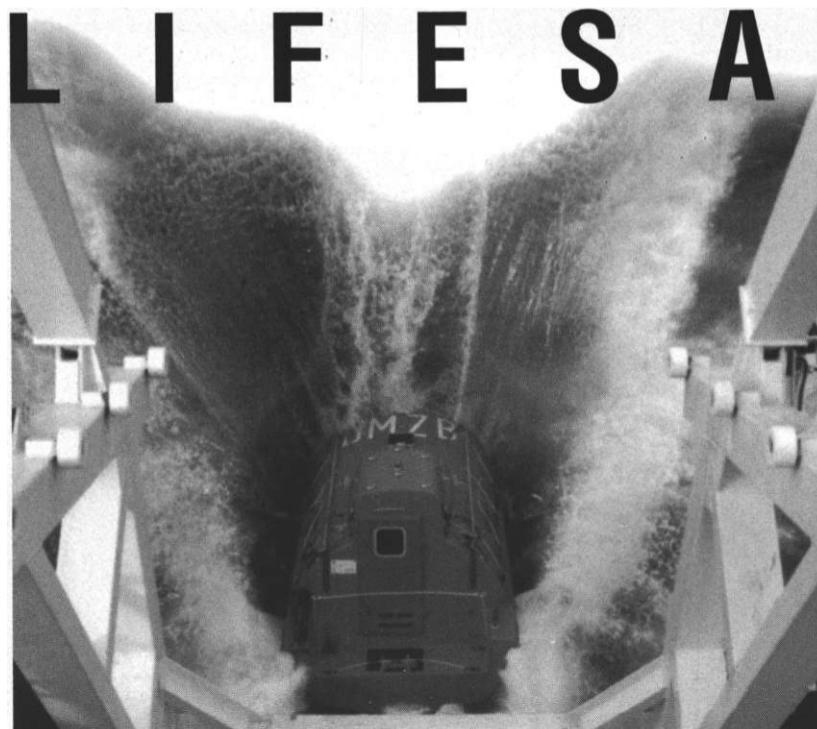
As an elastomer and plastic technology corporation, solving the problems of fendering, flotation, energy absorption, abrasion and corrosion, Seaward International Inc. has the experience and products to meet your needs.

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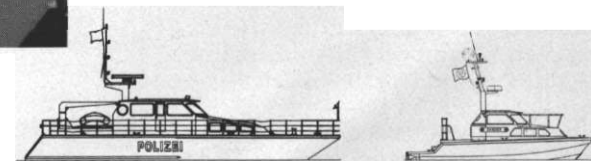
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Lykes Bros. Announces Organizational Changes

Lykes Bros. Steamship Co. recently announced some organizational changes. **Carl J. Horn** has been named executive vice president with responsibilities for all customer acquisition and operations functions of the company; and **Joseph T. Lykes III**, senior vice president - administration, has assumed expanded responsibilities to include all procurement activities of the company in addition to the information technology, human resources and corporate relations functions.

Mr. **Horn** joined Lykes in 1979 as director of operations in San Francisco, and held a number of positions before being named to the newly-created position of vice president - customer acquisition in 1993, with responsibilities for all sales, order fulfillment functions, liner and conventional services for Lykes.

Mr. **Lykes** joined the company in New Orleans in 1971. After serving in Antwerp, Belgium as manager - traffic, for Lykes Lines Agency, Inc. and as Lykes owner's representative in Tokyo, he returned to the New Orleans headquarters as tonnage controller. In 1993 he was named senior vice president - administration, with responsibility for support activities, including human resources and information systems. He is also responsible for the broad re-engineering initiatives underway in the company.

QUBIT Acquired By Kelvin Hughes

Kelvin Hughes, the naval and marine division of Smiths Industries PLC, has acquired QUBIT U.K. Ltd., to join its group of maritime technology providers.

A Kelvin Hughes representative explained that the action was the culmination of a long-term strategy to strengthen its expanding navigation systems business.

Kelvin Hughes is one of the world's largest chart agents and providers of radar and navigation systems to the international maritime fleets.

Huang Replaces Chang As Evergreen America President

Richard Huang has been named president of EVA Airways Corporation - U.S. Head Office, and **Marcel Chang** has been named president of Evergreen America Corp.

Mr. **Huang**, who has been serving as president of Evergreen America since 1989, moves to a newly created position for the Evergreen Group worldwide airline, heading up its North American operation, based in Los Angeles. Mr. **Chang**, who succeeds Mr. **Huang**, joined Evergreen in 1974 as a department clerk. He transferred to

the U.S. from Hamburg, where he was managing director of Evergreen Deutschland GmbH, the company's European headquarters. Previously he had held management and executive positions in the company's world headquarters in Taipei and also represented Evergreen in France.

Evergreen America Corporation is the North American agent for Evergreen, which is among the largest container carriers in the world. The carrier operates a variety of full container trades, including weekly two-way round-the-world services.

Wells Retires From Texaco Lubricants

Kenneth F. Wells, president of Texaco Lubricants Company North America (TLC), a division of Texaco Refining and Marketing Inc., a wholly-owned subsidiary of Texaco Inc., retired effective Sept. 1.

Under Mr. **Wells**, TLC successfully introduced Havoline Formula³ in the U.S., Latin America, Europe and the Pacific Rim through Caltex (a joint venture between Texaco and Chevron). Mr. **Wells** joined Texaco in 1956 as a petroleum engineer, and held positions of increasing responsibility until he was appointed president of Texaco Lubricants Company in 1990.

Lovejoy Adds North American Sales Unit

Lovejoy Inc. has added a North American Centa Marine sales and service unit to its Centa/Lovejoy Engineered Couplings Division, bolstering the company's support of the marine power-transmission industry throughout the U.S., Canada and Mexico. The company has named **James L. Halley** to head the new unit as product manager.

Mr. **Halley** brings more than 25 years of experience to the new position, including U.S. and European diesel engine sales for Caterpillar, contracting work with the U.S. Navy and U.S. Coast Guard, and direct

Textron M&LS President Honored By Navy League

John J. Kelly, president of Textron Marine & Land Systems, a division of Textron Inc., has been named the recipient of the Robert M. Thompson Award for Outstanding Civilian Leadership, presented annually by the Navy League of the United States. He was honored at the Navy League Convention.

The Thompson Award recognizes a civilian who has made a significant personal contribution to furthering the recognition of sea power's importance to the U.S.'s national security and economic well-being. It is the highest civilian award presented by the Navy League. Past recipients of the award include Senators **John McCain** and **Sam Nunn**, former Secretary of Defense **Caspar Weinberger**, and many industry leaders including **Robert Crown**, chairman of General Dynamics, and **Ralph J. Cordiner**, chairman of

Garrow Retires From Newport News

Jack A. Garrow, vice president of public relations at Newport News Shipbuilding (NNS), announced his retirement from the shipyard, effective Aug. 31.

He joined the yard in 1986 after 31 years in the Navy.

In accepting Mr. **Garrow's** retirement, **Pat Phillips**, president and CEO of NNS, said, "He has done a great job for the shipyard and we will miss him." Mr. **Garrow** graduated the U.S. Naval Academy in Annapolis, Md. in 1955. After gradu-

ation he served for 31 years as a public affairs specialist in Europe, the Far East and both coasts of the U.S. He was chief of information for NATO in Southern Europe, and ended his career in the Navy as its chief of information in Washington with the rank of rear admiral. Among his Navy awards are the Distinguished Service Medal, the Joint Meritorious Service Medal, the Joint Service Commendation Medal and the Navy Commendation Medal with Combat V.

sales and marketing in the Latin American marine industry.

Lovejoy manufactures, distributes and services a broad line of torsional couplings, universal joint shafts and bearing housings designed specifically for marine drivetrains in large and small vessels. The line includes a complete range of flexible couplings and shafting systems for boat and ship propulsion.

Tindall Named ICOM's Marine Div. Manager

ICOM America, Inc. has appointed **James Tindallas** the manager of its Marine Division. With more than 19 years of experience in the marine marketing field, Mr. **Tindall's** responsibilities will include sales and marketing of all ICOM marine products, developing dealer relationships and overseeing the regional sales managers.

Mr. **Tindall** was previously with ComMar, ICOM's Northeast marine dealers' representative, as a sales manager in Annapolis, Md. and Washington, D.C. Prior to that, he was president and founder of Coast Navigation, a marine marketing organization. Mr. **Tindall** received his MBA from Harvard University. He is now based out of ICOM's corporate headquarters in Bellevue, Wash.



John J. Kelly

General Electric. Mr. **Kelly** has been an industry leader in the area of advanced technology and a driving force in the development of air cushion vehicles and surface effect ships (SESS). His pioneering efforts resulted in the development of the LCAC (Landing Craft, Air Cushion).

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Long Beach, CALIFORNIA 90815
Telephone: (800) 248-5579

Coppedge Marine Inc.
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Jacksonville, FLORIDA 32207
Telephone: (904) 398-9586
Telefax: (904) 398-0373

Maguire Bearing Co.
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Honolulu, HAWAII 96819
Telephone: (808) 847-3531
Telefax: (808) 842-4889

Marine Industries Corp.
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Telephone: (800) 733-3130
Telefax: (812) 283-9628

Marine Industries Corp. (Gulf)
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Telefax: (207) 797-9158

Johnson Packings & Industrial Products, Inc.
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MASSACHUSETTS 01089
Telephone: (413) 733-7861
Telefax: (413) 732-2210

Argo International
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Telefax: (503) 286-8723

Hampton Sales Inc.
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Telefax: (215) 784-0392

Pacific Marine Equipment Inc.
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Telefax: (206) 285-9101

Pacific Propulsion (Canada) Ltd.
1451 Chartwell Drive, W. Vancouver
BRITISH COLUMBIA V7S 2R9
Telephone: (604) 988-2299
Telefax: (604) 922-4451

Avalon Marine Ltd.
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Telephone: (902) 456-1381
Telefax: (902) 462-1004
H.P.P.D.L. Inc.

9653 Clement Street
Lasalle, QUEBEC H8R 4B4
Telephone: (514) 364-0808
Telefax: (514) 364-0454

For International Distributors - Contact
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3225 Mainway Drive
Burlington, ONTARIO L7M 1A6
Telephone: (905) 335-1440
Telefax: (905) 335-4033

Sperry Integrated Bridge Systems Approved By BV

Bureau Veritas, the French classification society, has approved Sperry Marine's VMS 2001, VMS 3001, VMS 4001 and VMS 4002 integrated bridge systems. The systems, which have previously been approved by Germanischer Lloyd (Germany), Lloyd's Register (U.K.), Det Norske Veritas (Norway) and

the Russian Register of Shipping, are currently installed on scores of vessels trading in every part of the globe. Sperry recently won a contract to supply a complete suite of bridge navigation equipment for five Strategic Sealift ships. Among the equipment in the contract are RASCAR radar ARPAsystems, SRD 331 Doppler speed logs, SRD 421/S two Axis speed logs, MK 37 Mod E gyrocompass systems, ADG 6000 steering control systems and com-

plete GMDSS radio systems. Deliveries are scheduled to begin in 1995.

U.S. Paint Appoints Marine Sales Team

U.S. Paint Corp. has appointed a team of marine coatings specialists to manage its AWLGRIP® Marine Coatings Div. "Flip" Thomsen has been promoted to the newly created position of manager,

Megayacht Division, with responsibility to expand sales in the luxury megayacht market globally. David Halcomb has been promoted to manager, Marine Trade Sales. He will be responsible for sales and service to the U.S. Paint distributor network. Jeff Holland will join the U.S. Paint marine team as sales and technical representative in South Florida.

MarineSafety Intl. Gets \$9.4M From MarAd For R&D

MarAd has awarded a \$9,418,806 task order contract to MarineSafety International, Inc., to conduct research and development studies pertaining to ship handling simulation. The work will be performed at MarAd's Computer Aided Operations Research Facility (CAORF), National Maritime Research Center at the U.S. Merchant Marine Academy in Kings Point, N.Y.

For more information on Marine Safety
Circle 151 on Reader Service Card

MarAd Approves Guarantee For \$35M Alabama Shipyard Newbuilds

MarAd has approved a \$26,250,000 loan guarantee for the financing of two integrated tug/barge units being built in the U.S. to meet the requirements of the OPA 90. An application was filed on April 13, 1994 by Penn Barge Inc., Stamford, Conn., under MarAd's federal ship financing (Title XI) program. The approved guarantee is for \$26,250,000, which is 75 percent of the estimated total cost of \$35,000,000. The double-hull barges are being built by Alabama Shipyard Inc., Mobile, Ala. They will each have the capacity to carry 122,000 barrels. Deliveries are scheduled for January and June, 1995. The 127-foot, 7,000 hp tugs will also be built by Alabama Shipyard, Inc. The vessels will be used to carry asphalt or petroleum products in the Gulf of Mexico and along the Eastern Seaboard.

For information on Alabama Shipyard
Circle 152 on Reader Service Card

MarAd Approves Title XI Guarantees For Aker Gulf Marine-Built Vessel

MarAd has approved a request from Global Industries, Ltd., Lafayette, La., for a Title XI guarantee to aid in financing the construction of one dive support vessel with a remote operated submersible. The vessel will be built by Aker Gulf Marine, Ingleside, Texas. The approval guarantee amount for the dive support vessel and remote operated submersible is \$20,852,356 or 87.5 percent of the total estimated actual cost of \$23,831,264. Of that amount, \$13,611,653 is for shipyard work.

For information on Aker Gulf Marine
Circle 153 on Reader Service Card

FINALLY, A RUDDER BEARING - GUARANTEED TO LAST



Above: Matson container ship R.J. Pfeiffer equipped with SXL rudder bearings. Left: David Read, Thordon's president displays a variety of SXL rudder bearings.

Along with this exclusive guarantee, SXL users benefit from THORDON'S unique self-lubricating ability that eliminates the expense and pollution potential of traditional greasing systems, while ensuring smooth, low friction operation.

And we have more than reputation and pollution-free reliability to back our confidence; all THORDON bearings are manufactured to the strict requirements of the ISO 9002 Quality System - the world's most exacting standard. That's important, since THORDON bearings are stocked in over 50 countries.

We invite you to share our confidence in SXL for your next rudder bearing installation. Please call, fax or write for prompt attention to your inquiries.

We Guarantee It.



Attn: David Read, President, Thordon Bearings Inc.
Tell me more about SXL's reliability and exclusive guarantee.

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Company _____
Address _____
City _____ State/Prov _____ Code _____
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Thordon Bearings Inc., 3225 Mainway Drive, Burlington, Ontario L7M 1A6
Telephone (905) 335-1440 Fax (905) 335-4033

In the shipping business, reliability is so important that every supplier promotes the trouble-free service their product can deliver.

We're no different at THORDON Bearings Inc. In over 25 years of supplying rudder and propeller shaft bearing systems, we've got some great performance histories to share with you.

THORDON SXL Rudder Bearings for example, routinely outlast competitive products by a factor of two to three times.

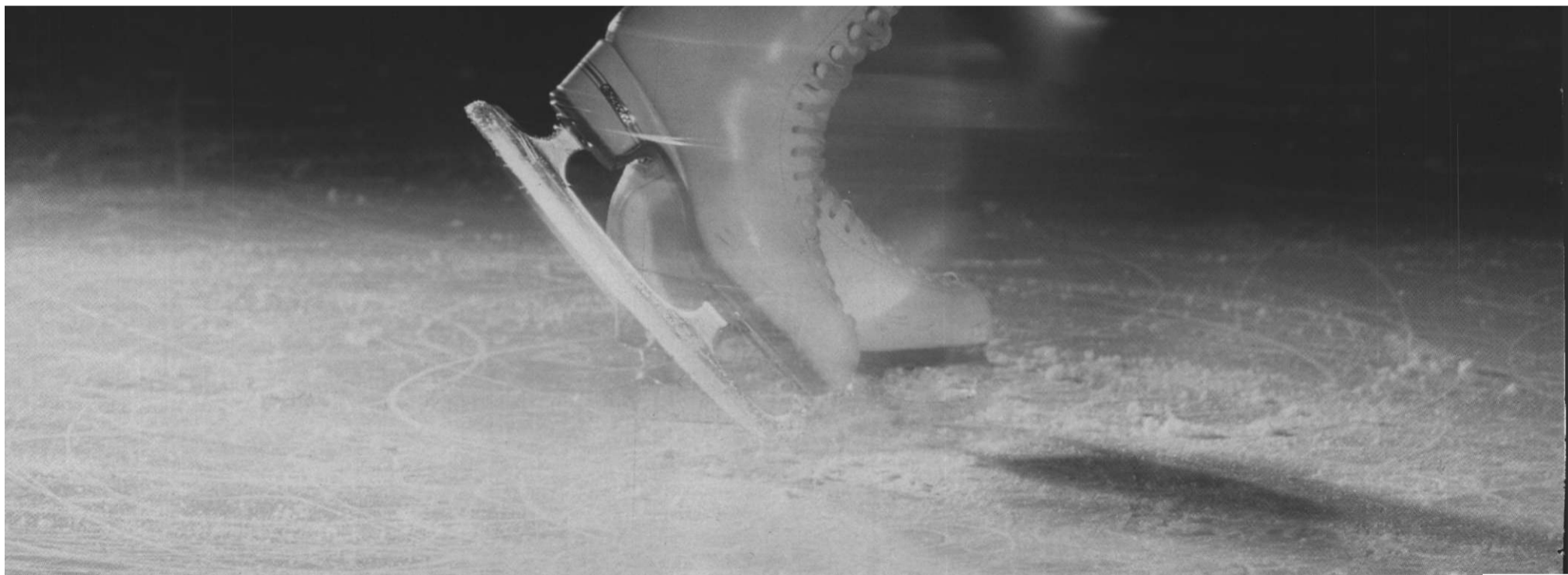
But there's a big difference between competitive promises and the hard facts supporting THORDON SXL pintle, stock and carrier bearings' reputation for durability; and we back our real world experiences with a no nonsense extended product guarantee, an industry first!

- In new build applications, THORDON SXL Rudder Bearings will meet Class Society wear specifications for 10 years or THORDON will supply a new bearing free.*
- In repair applications, THORDON SXL Rudder Bearings will meet Class Society wear specifications for twice the life of the replaced bearing or THORDON will supply a new bearing free.*

L

Circle 294 on Reader Service Card

THE BEAUTY OF 360



| jg^wms

AQUAMASTER - THE TRUE MEANING OF MANEUVRABILITY

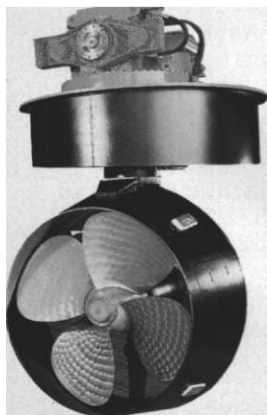
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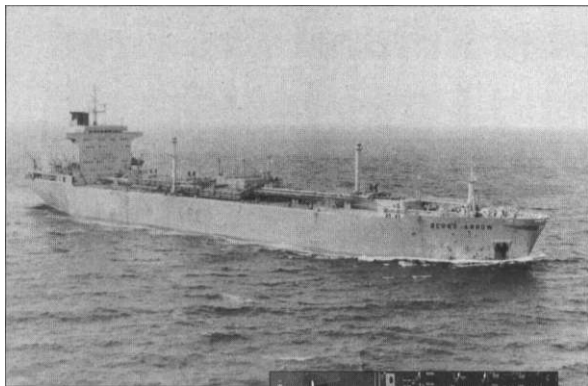
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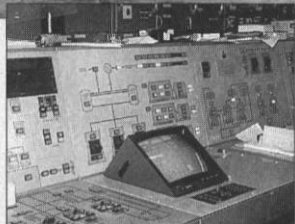
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Circle 283 on Reader Service Card

Renewing Engine Monitoring Systems In Old Ships Saves Money



An alarm and monitoring system from Moland Automation was installed in the existing control panel on the *Berge Arrow*, an upgraded ship, owned by Bergesen shipping company.



Faster and lower-cost replacement of ships' alarm systems is now an option for vessels struggling with costly maintenance of old monitoring equipment. Existing control panels can be used, and the upgrade even carried out, while the vessel is under way. Moland Automation in Arendal, Norway, has a system that monitors the main engines, auxiliaries, tanks and other technical functions on board. The system is technically approved by the leading classification societies.

Monitoring critical areas on board a ship prevents a collision or grounding due to engine breakdown by providing early warning of malfunctions in the machinery. The Bergesen d.y. shipping company chose to have Moland refit its older, "pre-1978" vessels. Moland installed a new system adapted to one ship while the vessel was under way.

Moland systems have now been installed in approximately 150 vessels, of which about 30 are older ships upgraded to the classification societies' standards for documentation and functionality of alarm systems.

These systems reportedly allow more preventive maintenance to be carried out on the equipment being monitored.

For more information on Moland Automation
Circle 70 on Reader Service Card

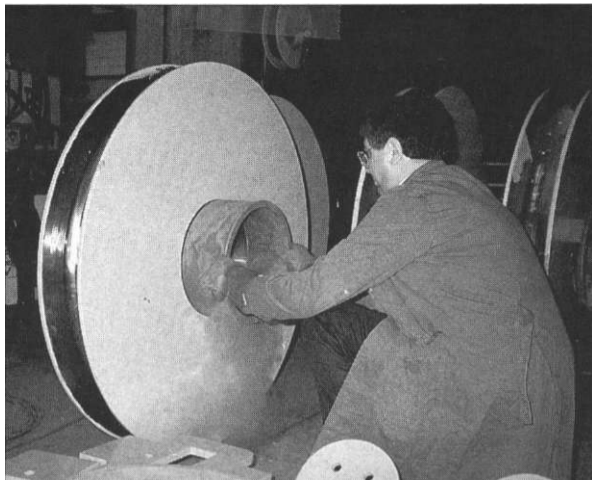
GEC Alsthom Diesels Selected For New Royal Navy Carrier



GEC Alsthom Diesels has won contracts worth more than \$2 million to supply diesel generating sets for the Royal British Navy's new helicopter carrier *HMS Ocean*. The four Ruston 12RKC and one Paxman Vega 12JZ sets will supply auxiliary and emergency power generation on the new vessel. The Kvaerner shipyard in Govan, Scotland supplied the hull and machinery systems. The new carrier will enable the Royal Navy and the Royal Marines to operate helicopters in support of an Amphibious Warfare Group, and to accommodate commandos, vehicles, ammunition and equipment.

For more information on GEC Alsthom Diesels
Circle 53 on Reader Service Card

Orkot Offers Heavy Load Carrying Composite Rudder Bearing



Orkot, the reinforced thermoset composite, can be freeze fitted without the danger of shattering.

Orkot Ltd. offers composite bearings for use at pressures up to 10 N/mm (1,450 psi). Normally the use of such material would be limited to 5.5 N/mm (798 psi). Orkot bushes can be used in demanding rudder designs. The company offers Orkot, a non-asbestos fabric-reinforced thermoset composite which incorporates solid lubricants, making it effective under light ballast conditions, or where there are extended periods between lubrication or lubrication cannot be guaranteed. The company claims it will tolerate edge loading and misalignment even with the heaviest of loads. Orkot is suited for freeze fitting without the danger of shattering.

For more information on Orkot Ltd.
Circle 51 on Reader Service Card

Meyer Werft Delivers Passenger Vessel M/S *Bukit Raya*



Meyer Werft of Papenberg, Germany delivered a 6,000-grt passenger ship to the Indonesian Ministry of Communications/Directorate General of Sea Communication, Jakarta.

The 328-ft. (100-m) ship was named *Bukit Raya* after a mountain on the island of Kalimantan, province of Kalimantan Tengah (formerly Borneo).

The *Bukit Raya* has a capacity for 970 passengers and is the 15th passenger ship for Indonesia. In 1995 Meyer Werft will deliver another vessel of this type to Indonesia.

When Meyer Werft completes the cruise vessel delivery in 1995, the yard will then have built a total of 22 ships for Indonesia — 16 passenger vessels, five cargo/passenger ships and one gas tanker.

For more information on Meyer Werft
Circle 7 on Reader Service Card

Ingalls Christens Aegis *Stethem*, Commissions Aegis *Stout*

The U.S. Navy's newest Aegis guided missile destroyer was christened *Stethem* at Ingalls Shipbuilding Division of Litton Industries. The new ship, DDG 63, is named in honor of Petty Officer **Robert Dean Stethem**, USN, (1961-1985). The ship's sponsor was Petty Officer **Stethem's** mother, Patricia L. Stethem.

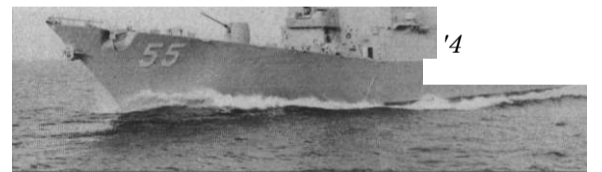
DDG 63 is 504 ft. long (153 m) with a beam of 59 ft. (18 m). Four gas turbine engines will power the 8,300-ton ship to speeds above 30 knots.

Stethem will operate with aircraft carriers and battle groups in high-threat environments, and will also provide essential escort capabilities to Navy and Marine Corps amphibious forces, combat logistics ships and convoys.



(Above) Navy veteran **Richard Stethem** and ship's sponsor **Patricia L. Stethem**. Their son, Petty Officer **Robert Dean Stethem**, USN, a Seabee and Navy diver, was posthumously awarded the Purple Heart and the Bronze Star for bravery and heroism as a victim of the hijacking of TransWorld Airlines Flight 847 to Beirut, Lebanon, on June 14, 1985.

(Below) DDG 55 is named in honor of Rear Admiral **Herald F. Stout** (1903-1987), a heroic Navy destroyerman of WWII.



Stout Commissioned in Texas

The U.S. Navy's Atlantic Fleet received its newest ship when USS *Stout* (DDG 55) was commissioned during ceremonies at the Port of Houston, Texas. DDG 55 is the fifth ship in the Arleigh Burke (DDG 51) class of Aegis guided missile destroyers, and the second Aegis destroyer to be delivered to the Navy by Ingalls Shipbuilding division of Litton Industries in Pascagoula, Miss.

Secretary of the Navy **John Dalton** delivered the principal commissioning address, and Chief of Naval Operations Adm. **J.M. Boorda**, USN, placed USS *Stout* in commission.

For more information on Ingalls
Circle 6 on Reader Service Card

Predicting Thermochemical Performance Of Materials Made Easier By NIST

Chemical manufacturers, material suppliers and researchers in science and industry now have a reportedly easy-to-use computer program for help in predicting the performance of chemicals in their custody, including storage, shipping

and use in the laboratory and manufacturing. The PC database, Chemical Thermodynamic and Energy Release Program — known as CHETAH — is available from the National Institute of Standards and Technology (NIST), of the U.S. Department of Commerce.

CHETAH version 7.0 is a tool for estimating both thermochemical properties and predicting certain reactivity hazards associated with a pure chemical, a mixture of chemicals, or a chemical reaction. The program is designed to conveniently and accurately calculate properties such as heat capacity, enthalpy, entropy and Gibbs energy of reactions as a function of temperature at 298.15 degrees kelvin.

The CHETAH computer program was developed originally by a group of researchers and scientists in the American Society for Testing and Materials' Committee E-27 on Hazardous Potential of Chemicals.

CHETAH 7.0 is designed for any MS DOS or PC DOS computer using DOS 2.1 or greater and at least 512 kb of memory. To order CHETAH, version 7.0 — which costs \$350 — contact the Standard Reference Data Program, A320 Physics Building, NIST, Gaithersburg, Md. 20899-0001; tel: (301) 975-2208; fax: (301) 926-0416

Atlantic Marine Wins Del Monte Repair Contract

Atlantic Marine recently won a contract for the drydocking and repair of six Del Monte vessels: the *Del Monte Planter*, *Del Monte Harvester*, *Del Monte Packer*, *Del Monte Transporter*, *Del Monte Trader* and the *Del Monte Consumer*. They were scheduled to drydock at two-week intervals beginning Aug. 8.

The work consists mainly of routine repair and maintenance. "We're very pleased we were favored with this contract," said **Darrell Green**, a sales and marketing representative of Atlantic Marine.

"We have not been going after Navy work," said Mr. **Green**. "This is our niche, and we are competitive on an international basis." He estimated that between 40 and 45 percent of Atlantic Marine's work last year was international, and this year

Mitsui Engineering & Shipbuilding Co. (MES) recently completed its natural gas-fired large low-speed diesel engine demonstration plant.

Built in its Chiba Works—and reportedly the first of its kind in the world—an inauguration ceremony was held in mid-July as the Gas-Injection Diesel Research Laboratory.

The laboratory is designed for demonstration research and establishment of gas injection technology by conducting loaded trial runs of the diesel power plant using a Mitsui-MAN B&W 12K80MC-GI-S type low-speed diesel engine (gas-injection diesel engine) as prime mover, to which a generator is directly coupled.

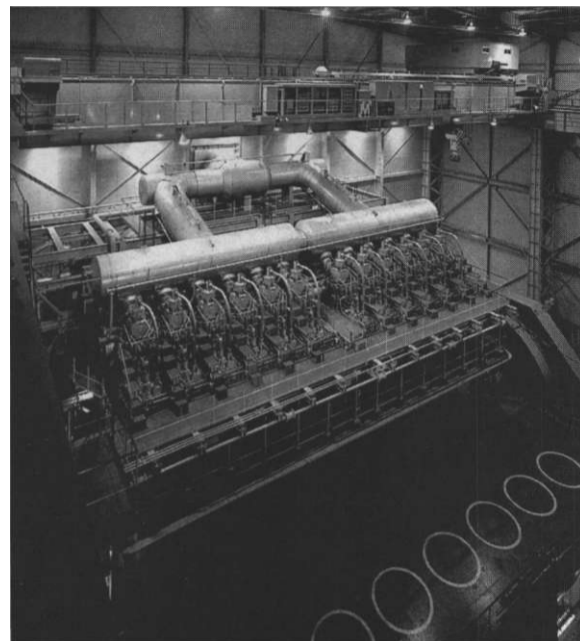
In operating a gas-injection diesel engine—in which its cylinders, at high temperature and high pressure inside under compression, receive the injection of natural gas fuel compressed to even higher pressure (this stroke is the same as in conventional oil-fired diesels)—a small quantity of pilot liquid fuel is used in combination for ignition, because the gas fuel has too high a fire point to begin combustion without such aid.

The plant uses pollution-free

it's shaping up to be 60 percent or more.

Atlantic Marine is a complete marine ship construction and repair company, certified to the the

MES Completes Natural Gas-Fired High Efficiency Large Low-Speed Diesel Demonstration Plant



natural gas as fuel because the Tokyo Bay area, where the Chiba Works is located, is under stringent environmental control.

The demonstration plant to be installed in this laboratory is intended not only to demonstrate the effectiveness of high-efficiency, low-pollution diesel-drive power generation, but also as a full-scale model of the main engine for future LNG carriers.

For more information on Mitsui Engineering
Circle 45 on Reader Service Card

ISO 9002 standard of commercial quality.

For more information on Atlantic Marine
Circle 75 on Reader Service Card

Global Ocean Carriers Considers U.S. Yards, Title XI For Fleet Expansion

Global Ocean Carriers Ltd. announced two fleet expansion projects are currently being considered, and that the company is evaluating the possibility of taking advantage of the Title XI financing available.

The company reports it is contemplating ordering new container feeder vessels, and is assessing U.S. yards to determine which is most capable of building competitively priced vessels.

In addition, the company is in negotiations for the purchase of eight

handysize and handymax vessels including a pair of 1994-built ships.

"These projects are only two of a number of growth alternatives which management is currently considering prior to presentation to the board of directors," said **Nikolas Tsakos**, executive director. "They would both represent a realization of our policy of modernizing and expanding our fleet. Besides being profitable, they would expand the scope of our activities and create further opportunities for charter-

ing business and fleet expansion. However, both projects need to be carefully assessed further by management.

They would require additional financing and we shall be discussing alternatives open to us over the summer."

Global Ocean Carriers, founded in 1988, currently has a fleet of seven vessels, including three panamax and one handysize bulk carrier, a product tanker and two container vessels.



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Circle 337 on Reader Service Card

N.E. Waterborne Gaming Conference & Exposition

October 3 & 4, New York

The Northeast's first Waterborne Gaming Conference will be held at the Whitehall Club in New York City.

The conference is sponsored by The Maritime Association of the Port of NY/NJ. With the forecast promising legalization of waterborne gaming by 1995 in New York, New Jersey and Pennsylvania (see related story, this page), the conference panels were designed with the goal of merging The Maritime Association's experience and knowledge in the maritime industry with the experience of many talented representatives from other states who have implemented waterborne gaming.

Panelists scheduled to appear at the conference include:

- **Glenn Ashe**, director of business development, ABS Americas

- **Lawrence Evans**, director of domestic affairs, Transportation Institute

- **John Gilbert**, president, John W. Gilbert & Associates, Inc.

- **Arthur B. Hahn, Jr.**, president, Waterfront Development Corp.

- **Sharon May-Zinser**, vice president, sales & marketing, Directions In Design, Inc.

- **H. Steven Norton**, president and CEO, Argosy Gaming Co.

- **Scott Scherer**, executive director of corporate development, International Game Technology

- **Ronald Thornton**, CPCU, executive vice president, Marine Office of America Corp.

- **James Zok**, deputy associate admin-

istrator for maritime aids, Maritime Association

The conference will cover Congressional legislation, focusing on the creation of an American-flag cruise industry and the implications of that legislation, and full information from the Maritime Administration on Title XI Ship Financing.

For more information on the Northeast Waterborne Gaming Conference & Exhibition, contact The Maritime Association of the Port of NY/NJ at tel: (212)425-5704.

Casino Vessel Market Roots Spread To N.E.

Legalized riverboat gaming is — according to various market indicators — primed to spread to and throughout the Northeast U.S., specifically New York, New Jersey & Pennsylvania.

To help pave the profitable way for suppliers to the industry, the Maritime Association of the Port of New York/New Jersey will present the Northeast's first waterborne gaming conference and exhibition, dubbed "Rediscovering our Waterways & Waterfront," scheduled for October 3 & 4 at the Whitehall Club in New York (see story, this page).

However, as any casino vessel builder, supplier or designer can attest, the casino vessel market starts and spreads with successful legislation in a given state or area. To date, none of the above-mentioned states have legalized casino riverboats, but according to many inside sources, the time is close for one or more to bring this ever-growing popular entertainment source to the waterways of the Northeast. The following is a state-by-state update of promising casino vessel legislation in the Northeast.

NEW JERSEY: Assemblyman (6th District) **Wayne R. Bryant**, Esq. proposed riverboat gaming legislation which, basically, reads: "If a state bordering this state authorizes the conduct of any form of casino gambling, the legislature shall authorize by law, within six months thereafter, the conduct of casino gambling on boats which are permanently docked at, or are principally docked at and operate from sites on the shores of this state. The law authorizing such casino gambling shall provide that: (1) only holders of licenses which are operating casinos in Atlantic City shall be licensed to conduct the casino gambling on such boats; (2) no such license holder in Atlantic City shall be licensed to conduct such casino gambling on more than three boats; and (3) the tax on such casino gambling shall be at the same rate set by law for the operation of gambling establishments in Atlantic City ... except that 25 percent of the state revenues derived from casino gambling on each boat shall be transmitted to the municipality in which the boat is permanently or principally docked."

NEW YORK: N.Y. Senator **Nicholas A. Spano** introduced Senate Bill 6529, which would legalize casino gaming in the Catskill region of the state, casino gaming on vessels navigating the state waters and waterways, and certain gaming at horse racing tracks

and simulcast theaters. Specifically, the vessel portion of the bill permits games of chance, any card games of chance, electronic or electromechanical facsimiles of any games of chance, or slot machines upon public vessels being navigated upon state waters and waterways as authorized by the legislature, but only approved in county referendum.

The justification for the bill is that neighboring states currently allow established casino gaming and other gaming opportunities, citing, among others, Pennsylvania's proposed riverboat gaming legislation. The bill also states that "several other New York tourism areas would profit by the use of our beautiful natural bodies of water and waterways for riverboat gambling. The use of state's waterways offers a natural form of containment for the gambling environment and eliminates the high cost of land acquisition and siting (i.e. New York City). The Mayor of New York City and other cities have requested the ability to host riverboat gaming."

PENNSYLVANIA: Representative **Frank Gigliotti**, chairman of the subcommittee of the Finance Committee, has been working to garner support for House Bill 1883. The bill, which "has already changed and will probably change three or four more times before the final draft," according to Rep. **Gigliotti**, is being ushered around the state in an attempt to gain valuable input from other state legislators. Rep. **Gigliotti** also plans to seek the input of the governor, and will wait until after this fall's gubernatorial elections to do so. If everything goes as planned, he predicts the bill will be up for a May primary vote, and, pending those results of course, his best-case scenario includes Pennsylvania's first boat in late 1995 or early 1996. Rep. **Gigliotti** was adamant about the bill being still in its formative stages, stressing that the final version could look far different than the current version. However, the current bill would provide for three classes of licenses, each with a different franchise tax structure: First Class (\$30 million) for the counties which house Pittsburgh and Philadelphia, providing five licenses apiece; Second Class (\$20 million) for Erie and Delaware counties, two licenses apiece; and all other counties would have Third Class (\$15 million) status, eligible for one license each. The current bill would cap the state riverboat vessel total at 18 to 20.

HOLLA



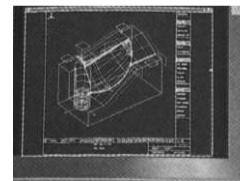
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House Approves \$ 1.35 Billion For Maritime Reform

Money raised by increasing duty on ships visiting U.S. ports

The final piece of a comprehensive, bipartisan initiative authored by Rep. **Gerry E. Studds**(D-Mass.) to reform and revitalize the U.S. maritime industries was approved by a vote of 294 to 122 by the U.S. House of Representatives. Passage of the bill — H.R. 4003, the Maritime Administration and Promotional Reform Act — provides funding offset required to enact the ship operating and ship building programs agreed to by the House last November to aid the U.S. maritime industries.

"The House voted to ensure that American flags continue to fly from vessels carrying this nation's commerce. That American shipyards will someday soon build another commercial vessel," said Rep. **Studds**, who is the chairman of the House Merchant Marine and Fisheries Committee.

The final version passed by the House represented a compromise

between the original proposal for \$1.7 billion, from the Studds committee, and a version for only \$1 billion adopted by the Ways and Means Committee.

The amendment would increase the existing duty from nine cents per ton (assessed on vessels calling from Western Hemisphere ports) and 27 cents per ton (vessels calling from other world ports) to a flat 38 cents per ton. The amendment also raises from five to 25 the number of times the duty can be assessed each year.

Of the U.S. maritime initiative, Rep. Jack Fields, the ranking Minority Member of the Committee, said, "If we do not act now to pass H.R. 4003 to fund maritime reform, our own government will do what our wartime enemies have never been able to do — sink the U.S. merchant marine and remove the American flag from the world's oceans."

Trinity Wins \$120-Million Contract For Two Vessels

*President Clinton announces contract award;
Title XI financing plan helps secure order*

A direct beneficiary of the Title XI financing guarantees was Trinity Marine Group (TMG), a subsidiary of Trinity Industries, Inc., which includes 15 shipyards.

The company has been selected to build two, 720-ft.(219.5-m) catamaran RoRo barges for approximately \$ 120 million for Coastal Ship Inc. of New York, N.Y.

It is the second largest single commercial contract in the history of TMG.

The barges, expected to take 30 months to build, will each have a capacity to carry up to 1,068, 48-ft. (14.6-m) over-the-road trailers.

The barges will be operated under charter by Allen Freight Trailer Bridge Inc. between the mainland U.S. and Puerto Rico.

"We are doubly pleased to win this contract because it will provide work for many employees in four of our shipyards for 2.5 years, and we are happy because Trinity was selected in an intense competition..." said **John Dane III**, president of TMG.

Both barges will have a 59-ft. (18-m) molded beam for each catamaran hull. Overall beam of the entire barge with the two hulls joined together will be 194.5 ft. (59.3-m). Design draft will be 27 ft. (8.2 m) and each barge will displace 50,225 long tons.

Designed by C.R. Cushing & Co., Inc. of New York, they will have five level decks for accommodating 102, 220, 242, 252 and 252 trailers in 18 curbed lanes per deck, set on Pullman type stands also built by a Trinity division.

The barges are designed for unstaffed operations and have many features to achieve the maximum extended drydocking intervals permitted by regulatory bodies.

They will be built to the requirements and recommendations of ABS for unrestricted ocean service and will be classed Maltese Cross, Circle E, Maltese Cross AMS Deck Barge.

For more information on
Trinity Marine Group
Circle 48 on Reader Service Card

• m few simple
truths from Trimble:

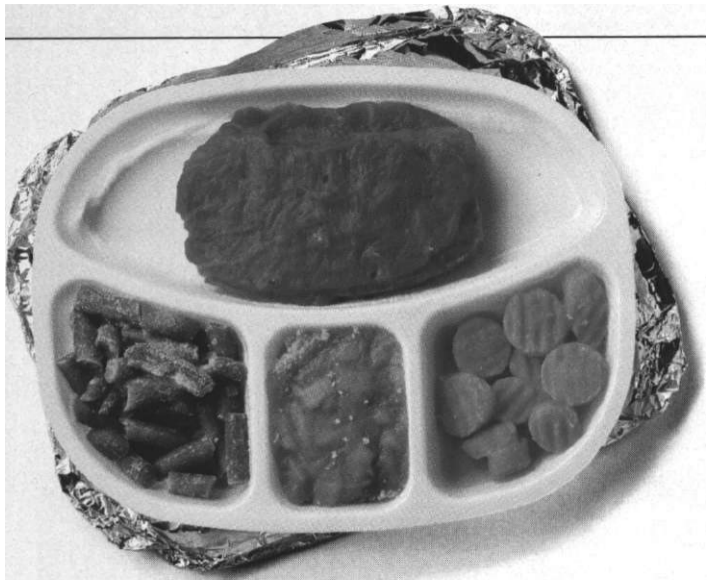
1) We have no
intention of getting
into the refrigerator
business.

2) No, we don't
own the satellites.

3/ And, yes,
we did just launch a
few new products
that are causing a
bit of a ruckus.

Circle 295 on Reader Service Card

Maritime Reporter/Engineering News



1) There are undeniable advantages to focusing on one thing—and one thing only. Take our competitors. Let's start with the big ones. You'll see they're all in a lot of different businesses.

Businesses like inventing new space telescopes, maybe missiles, or, yes, even refrigerators. Businesses that, though they do develop one's engineering prowess, have very little to do with marine GPS.

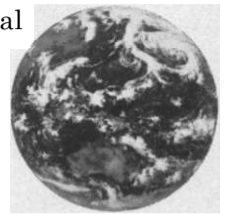
At Trimble, GPS is all we do. It's where we pour our R&D efforts—more than two million man-hours to date. We've focused our entire company on inventing cutting-edge GPS solutions.

If we're to be honest about it, we got a head start on our competitors. We were dedicated to GPS long before it was even a buzzword, let alone the most precise way to navigate through inland waterways, rocky coastlines, and high seas.

This head start enabled us to bring to market the world's first commercial GPS product in 1984. And in 1985, the world's first marine navigation system. And in 1989, the world's first large flat-screen display and GPS system in one—complete with NOAA charts. Then in 1990, the world's first totally integrated GPS receiver and antenna system, Acutis, and then in 1992, our popular hand-held Ensign.

All of which is a long-winded way of saying we're rather fixated on building the most innovative, most accurate, and most dependable GPS solutions around.

2) With performance this good, you might think we owned the Whole damn GPS Satellite network. Here's a true story: Last month, we were out testing some of our new differential products with customers. First, we used one of our differential receivers to prove we can pinpoint any buoy, dock, or isthmus within ten meters—anywhere in the world. Then we showed how Trimble can get a lock on your location within seconds. And then we demonstrated just how true our readings are, even when you radically change your speed.

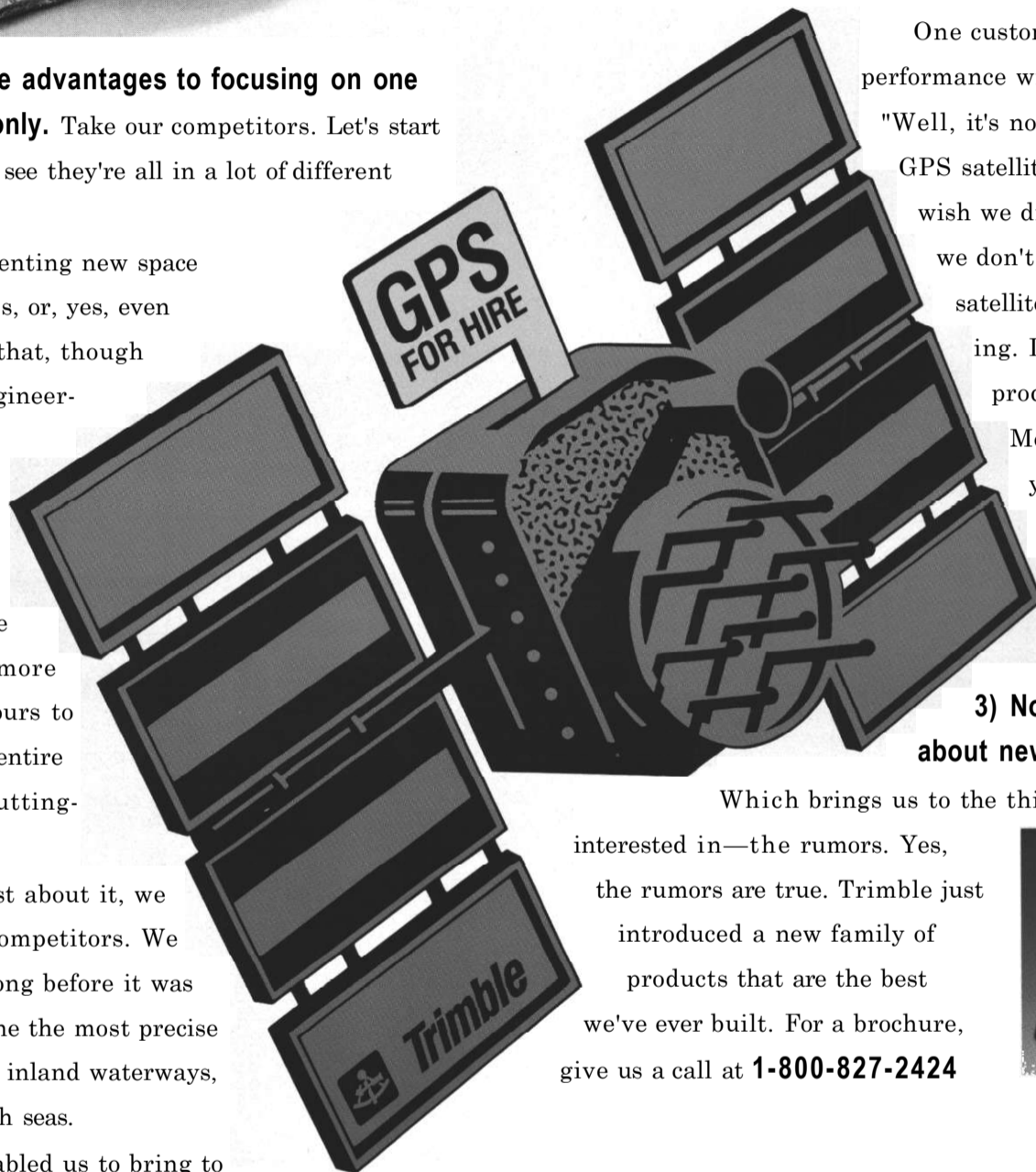


One customer, comparing that performance with our competitors, said, "Well, it's not fair—you own the whole GPS satellite system." Of course, we wish we did. But we have to admit we don't. The fact is that all GPS satellite data is free for the taking. It's just that not all GPS products are created equal.

More than anything else, your accuracy and performance is determined by one thing—whose product you buy.

3) Now about that gossip about new products from Trimble.

Which brings us to the thing you're probably most interested in—the rumors. Yes, the rumors are true. Trimble just introduced a new family of products that are the best we've ever built. For a brochure, give us a call at **1-800-827-2424**



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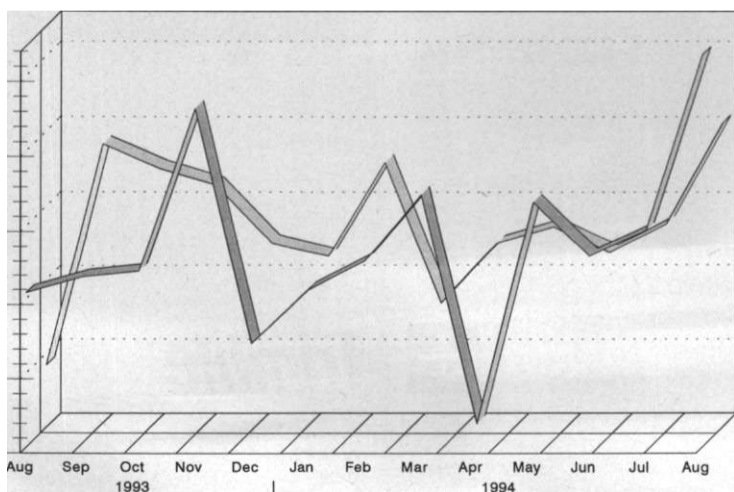
RECENT SHIP SALES

This report, compiled by Shipping Intelligence, Inc. — a New York maritime consulting firm — tracks sale prices of secondhand bulk carriers and tankers.

Data	Vmml Nam*	Typ*	DWT	Year Built	Sale* \$ (million*)
8/6	Fareast Progress	Bulker	16,785	77	\$3.3
8/15	Dragon Wealth	Bulker	21,341	83	\$8.2
8/8	Garnet Star	Bulker	22,026	84	\$9.25
8/8	Admiral	Bulker	22,457	83	\$8.45
7/18	Ocean Aya	Bulker	23,286	84	\$9.0
7/25	Golden Rose	Bulker	23,516	83	\$9.2
7/18	Friendly Islands	Bulker	26,643	73	\$2.75
8/15	Rubin Doga	Bulker	26,717	85	\$12.5
7/25	Gransol	Bulker	26,841	86	\$13.85
7/18	Angel li	Bulker	26,952	74	\$3.6
8/8	Renu Sagar	Bulker	27,758	77	\$4.6
8/1	Ulla	Bulker	29,399	85	\$10.65
8/1	Verginia	Bulker	32,500	75	\$4.75
7/18	Fidestar	Bulker	34,289	73	\$3.4
7/18	Star Lily	Bulker	34,291	77	\$6.8
7/25	Nadelhorn	Bulker	34,942	72	\$3.0
8/8	Eiso	Bulker	35,974	75	\$4.5
8/8	Naimo	Bulker	35,982	75	\$5.0
8/1	Skipper N	Bulker	36,405	77	\$7.4
8/1	Great Harvest	Bulker	36,700	82	\$11.7
8/1	City of Port Louis	Bulker	36,850	84	\$12.55
8/1	Junri	Bulker	38,594	85	\$14.2
7/18	Ariana	Bulker	41,125	73	\$4.0
8/1	AlTaif	Bulker	41,270	71	\$1.0
7/18	Golden Triangle	Bulker	41,938	86	\$16.4
8/1	Aztlan	Bulker	43,665	89	\$20.0
7/25	New League	Bulker	46,040	85	\$15.85
7/25	Rana M	Bulker	50,301	77	\$7.25
8/1	Ravenna	Bulker	60,866	77	\$7.75
7/18	Chriemir	Bulker	61,203	80	\$10.2
8/15	Presence	Bulker	61,569	82	\$10.7
7/18	Silvergate	Bulker	67,826	75	\$5.3
8/15	Tsukuba Maru	Bulker	201,227	83	\$23.0
7/18	Petrobulk Rover	Tanker	29,990	80	\$7.5
8/15	Anand	Tanker	30,616	73	\$2.5
8/8	Torm Herdis	Tanker	39,977	88	\$22.5
8/15	Pacific Challenger	Tanker	42,237	88	\$22.5
8/8	Pacific Challenge	Tanker	42,237	88	\$22.5
8/15	Pacific Isis	Tanker	69,999	90	\$27.5
7/25	Seto Breeze	Tanker	98,731	88	\$26.5
8/15	Princess Ariadne	Tanker	124,624	74	\$3.8
8/15	Rhapsody	Tanker	139,527	77	\$6.95
7/25	Ise Maru	Tanker	258,674	74	\$6.25
7/25	Mountain Cloud	Tanker	285,506	74	\$12.3

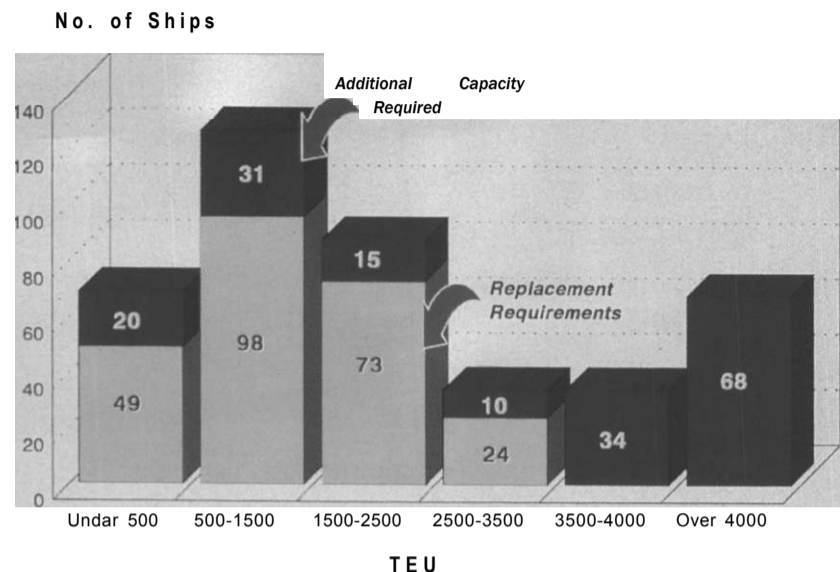
For further information, contact: Shipping Intelligence Inc., 25 West 43rd St., New York, N.Y. 10036, tel: (212) 997-0966.

Index Fleet Valuation



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Industry Trends *i*



By
James R. McCaul, president
IMA Associates, Inc.

IMA forecasts a construction requirement for more than 400 containerships over the next five years, driven by replacement requirements and increased demand for containership capacity. Particularly strong demand will be for new containerships in the 500- to 1,500-TEU range, as well as for megacontainerships exceeding 4,000 TEU. (Source: IMA Associates, *Five Year Outlook for U.S. Shipbuilding, 1994.*)

Tanker & Combined Tonnage Sold For Scrapping

Size	1991		1992		1993 (to date)		1994	
	No.	M.Dwt	No.	M.Dwt	No.	M.Dwt	No.	M.Dwt
10-50,000	29	1.97	91	5.41	97	4.86	43	2.59
200,000+	2	0.48	25	6.15	27	6.53	24	6.09
Comb. Car.	3	0.43	13	1.58	11	1.31	15	1.61
Totals	34	2.88	129	12.14	135	12.7	82	10.29

Source: INTERTANKO, Fearnleys A/S, Oslo

TO THE LEFT: The INDEX FLEET VALUATION is representative of the resale market for bulk carriers and tankers as a whole. The INDEX FLEET consists of 15 vessels — nine bulk carriers and six tankers — of various sizes and ages. Fluctuations in the value of the world fleet are mirrored in the INDEX FLEET.

Current Market Value	\$200.5
One Month Ago	\$193.8
Six Months Ago	\$197.9
One Year Ago	\$184.2

Source: Shipping Intelligence, Inc., 25 West 43rd St., New York, N.Y. 10036, tel: (212) 997-0966.

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Avondale Christens First Double-Hull Oiler, *Patuxent*, For Navy



T-AO 201, the 14th of 16 fleet replenishment oilers Avondale is building for the Navy, and the first in the series to be designed and constructed with a double hull, was launched and christened *Patuxent* in ceremonies in Avondale's Main Yard.

Patuxent is the first Navy ship designed and constructed to satisfy the Oil Pollution Act of 1990 (OPA '90). As a result of the contract

modification executed with Avondale by the Navy, the final three ships of the fleet oiler series, T-AO 201, T-AO 204 and T-AO 203, are being built to a double-hull configuration.

The sponsor of *Patuxent* was the Honorable U.S. Senator **Barbara A. Mikulski** of the State of Maryland, and the principal speaker at the christening was the Honorable Secretary of the Navy **John Dalton**.

The mission of *Patuxent* and her sisterships in the T-AO class is to transport bulk products from shore depots to combatants and support forces underway. The ships can also deliver fleet freight, cargo, water, mail and personnel.

Patuxent is 668 ft. (204 m) long and has a beam of 97 ft. (29.5 m), with a maximum draft of 36 ft. (11 m). *Patuxent* has a cargo capacity of 159,500 barrels of oil, and is capable of simultaneously receiving, storing and discharging two separate grades of cargo fuel. All cargo pump and valve operations, and the ship's segregated ballast system, are manipulated from the Cargo Control Center located in the aft superstructure.

Powered by twin 10-cylinder, medium-speed diesel engines, *Patuxent* is capable of service speeds of 20 knots.

For more information on Avondale
Circle 44 on Reader Service Card

Oriana Floated Out At Meyer Werft



The 67,000-gt cruise vessel *Oriana* was floated out at Meyer Werft Shipyard in Papenburg/Germany. After the setting up of new blocks, the *Oriana* was redocked and is being completed in the building dock. *Oriana*, being built for P&O Cruises, will reportedly be the first-ever luxury cruise liner custom-built for the British cruise market. With a length of 853 ft. (260 m) and a breadth of 105 ft. (32 m), the *Oriana* has a capacity of 1,975 passengers in 914 cabins. The engine output of 65,000 hp will provide the vessel with a service speed of 24 knots. Following delivery in the spring of 1995, the newbuilding is scheduled to operate cruises out of Southampton, U.K. to the Mediterranean, Atlantic Islands, Northern Europe and the Caribbean.

For more information on Meyer Werft
Circle 52 on Reader Service Card

Ruston Engines For European Super Seacat



GEC Alsthom Ruston Diesels will provide the propulsion for the new 259-ft. (79-m) 600-passenger catamaran fast ferry being built by Austal Ships for Sea Containers — the Super Seacat — which will enter service in Northern Europe in May 1995. The vessel will be powered by four 16-cylinder RK270s providing a service speed of 39 knots. Each hull will house two Ruston engines with power transmission through reduction gearboxes to the waterjets.

For more information from GEC Alsthom
Circle 40 on Reader Service Card

Kvaerner Energy's First Commercial Waterjet System Installed In Flying Cat *Vargoy*



The (40-m) Flying Cat *Vargoy* entered service, the first commercial craft to be fitted with Kvaerner Energy's waterjet design.

Built by Kvaerner Fjellstrand for Finmark Fylkesrederi for operation in the far north of Norway, *Vargoy* is fitted with two Kvaerner Energy-designed and -built 680mm waterjets, powered by two MTU 396TE74Ls.

Each waterjet has an MCR of 2,000 kW, although the service rating for each unit is 1,800 kW.

The 230-passenger capacity *Vargoy* is currently operating between Hammerfest and Honningsvåg.

Kvaerner Energy's waterjet range is designed to provide individual propulsion systems for all types of high speed craft, offering a waterjet design that is optimized with respect to simplicity, low weight and high efficiency.

Currently, the range comprises any output between 50 kN of thrust to 700 kN of thrust, corresponding to prime mover needs of 1,500 kW to 22,000 kW and speeds of up to 60 knots.

Besides this standard range of waterjets, Kvaerner Energy can also offer custom-made units, tailored to the exact requirements of a vessel operator.

Kvaerner Energy is supplying gas turbine propulsion modules to the Stena HSS design being built at Finnyards. The scope of the supply covers "father-and-son" gas turbine modules comprising General Electric LM 1600s and LM 2500s.

For more information on Kvaerner Energy
Circle 42 on Reader Service Card

Pacifica Hull To Specialize In Hull-Only Construction



Pacifica Hull, a new division of Metal Boat of Vancouver, Wash., specializes in the construction of bare hulls to customers' specifications.

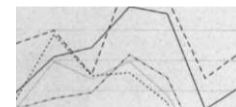
"We've seen increasing interest in the bare-hull market, and have found that many owners would be better served by contracting their own fitting out," said company President **Don Becker**. "We decided to create a separate business specializing in hull-only construction."

The yard recently launched a U.S. Coast Guard (USCG)-inspected, 65-ft. (20-m) by 33-ft. (10-m) aluminum catamaran, which was delivered to Hawaii by the owners, Fair Wind Inc. of Kona. The hard-chine hulls on the vessel are plated in .25-in. aluminum, with the central 40 ft. (12 m) of the V-bottom formed from a pressed sheet. Each hull has a depth of 7.6 ft. (2 m) and a beam of 8 ft. (2.4 m). Watertight compartments ensure positive floatation in the event of damage. Connecting the hulls is a continuous bridgedeck 3 ft. (1 m) deep.

For more information on Pacifica Hull
Circle 5 on Reader Service Card

Drewry Says Prosperity In Product Tankers Means Sale And Purchase Market Benefits

PRODUCT TANKERS: SPOT CHARTER MARKET DATA
— d u n product trade routes, 1992/93 Comparison of product tanker earnings



Drewry Shipping Consultants reports that after a period of relative prosperity from 1987-1991 product tanker earnings slumped in 1992, before staging a modest recovery in 1993. The main clean product tanker trade routes in 1992/1993 are shown in the figure alongside estimated net earnings for some key spot trades. In the first half of 1994 there has been modest improvement in both the spot and time charter markets. Drewry estimates net returns of \$3,000 to \$5,000 a day (assuming that a typical independent ship owner incurs costs of around \$7,000 to \$7,500 a day). Nevertheless, in appraising the investment potential of product tankers, Drewry's report *Product Tankers: Market Analysis, Fleet Developments and Profitability to 2000* suggests that in the medium term the acquisition of modern secondhand tonnage will provide significantly better returns than investment in newbuildings. To obtain copies of the report, contact: **Valerie Johnson**, Drewry Shipping Consultants, 11 Heron Quay, London E14 4JF, tel: +44 71 538 0191; fax: +44 71 987 9396.

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Circle 264 on Reader Service Card



LIEBHERR

The name for cranes

Chevron Introduces Oil Analysis Program

Chevron Lubricants has introduced a revamped and upgraded oil analysis program for all of its branded jobbers and their customers — the Chevron LubeWatch Maintenance Management System. According to Chevron, the system will provide customers with consis-

tent, pertinent data as well as a clear analysis of that data to help them manage their equipment and businesses as effectively as possible. In most cases, Chevron says that means an immediate reduction in the cost of a normal used oil testing procedure. The price for this standard set of tests will be consistent across all regions.

For more information on
Chevron LubeWatch
Circle 100 on Reader Service Card

Red Adair Co. And Oil Mop Announce Cooperative Pact

The Red Adair Co., a subsidiary of Global Industries, Inc., and Oil Mop Inc. (OMI), a subsidiary of Ambar Inc. — both based in Lafayette, La. — have signed a formal agreement to market and perform their complementary services.

Environmental and engineering services will include project man-

agement, site analysis, risk assessment, contingency planning, well control, emergency response, spill containment and recovery, firefighting, salvage and lightering.

For more information
Circle 126 on Reader Service Card

Top Managers Named At Bollinger

Boysie Bollinger, CEO and chairman of the board of Bollinger Machine Shop & Shipyard, Inc. has named two new vice presidents for Bollinger companies. **Tillman Esteve** has been promoted to vice president and coordinator of all repair yards, including Algiers Iron Works & Dry Dock Co., Inc. and Bollinger Quick Repair, Inc. in Harvey, Bollinger Fourchon, and Bollinger repair yards in Lockport and Larose. A new position, vice president of marketing, has been filled by **Scott Theriot**. Mr. **Theriot** will coordinate marketing for all Bollinger companies and subsidiaries.

Dave Marmillion has been named general manager at Bollinger Quick Repair in Harvey. Mr. **Marmillion** has over 25 years experience in the location. **Dan Trawick** has been named general manager at Algiers Iron Works & Dry Dock Co., Inc.

For more information on Bollinger
Circle 143 on Reader Service Card

MarAd & CYBO Robots In Welding Technology Project

Acting as agent for the Advanced Research Projects Agency (ARPA) of the Department of Defense, the Maritime Administration (MarAd) has entered into a cooperative agreement with CYBO Robots, Inc., Indianapolis, Ind. to develop and build a portable robotic welding system.

Participation in the industry-initiated research and development projects is one element of the President's plan to strengthen American shipyards. MarAd is an agency of the U.S. Department of Transportation.

Partners with CYBO Robots in the Portable Shipbuilding Robotics Project are: Stanford University; K2T, Inc.; University of Texas at Austin; Naval Surface Warfare Center, Carderock Division; Edison Welding Institute; Ingalls Shipbuilding Inc.; National Steel and Shipbuilding Co.; Bath Iron Works; and National Institute of Standards and Technology.

The total value of the agreement is \$13 million for the first phase of the research. The government will provide up to \$4.4 million over the two-year period of the agreement. CYBO and its partners will contribute \$7.6 million in cash and in-kind services. An optional second phase of the agreement, if exercised, would cost a total of \$9.3 million, of which the government would contribute \$2.5 million and CYBO and its partners would contribute \$6.8 million in cash and in-kind services.

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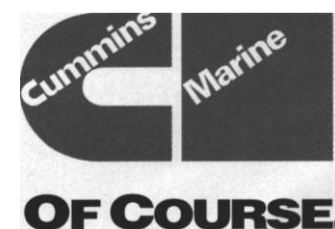
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Lisa Witherspoon

Witherspoon Named ViaSat Inmarsat Sales Mgr.

ViaSat Technology Corporation has appointed **Lisa Witherspoon** to the position of sales manager for Inmarsat Products.

Ms. **Witherspoon's** immediate responsibilities are for sales of the LYNXX™ Transportable Inmarsat-B earth station and the MULTI-

LYNXX™ Multi-Channel earth station.

ViaSat Technology Corporation is a California Microwave company offering a wide range of satellite communications equipment, including fixed and transportable Ku- and C-band earth stations, plus the LYNXX and MULTI-LYNXX 64 kb telecommunications systems which provide a global gateway to the ISDN network.

New Deputy Director For Port Authority Of N.Y./N.J.

Frank Caggiano of Palisades Park, N.J. has been appointed deputy director of the Port Department of The Port Authority of New York and New Jersey.

Mr. **Caggiano** will be responsible for the day-to-day operations of all aspects of the department, including management of the Port Authority facilities at Port Newark/Elizabeth, Red Hook in Brooklyn, Howland Hook on Staten Island and the Passenger Ship Terminal in Manhattan, as well as for planning, capital projects, marketing and sales.

Mr. **Caggiano** served as assistant director for Port Operations prior to his appointment as deputy director. In this position he was chief operating officer for the Port Department, responsible for management, physical planning, capital program development and construction management of the Port's New York and New Jersey facilities.

Two High Speed Vessels Set For Building In U.S.

Although details were not fully available at press time, it is expected that plans to build a pair of very high speed vessels in a U.S. yard will be announced soon.

The vessel is of the new Quadrimaran design, a patented product line of various-sized vessels capable of achieving 60 knots. Details of the Quadrimaran design were initially revealed in the November 1993 edition of *Maritime Reporter & Engineering News*.

The Quadrimaran multi-task design is a unique vessel which uses four wedge-shaped hulls under a main deck structure. The Quadrimaran concept is marketed in North and South America by the Baltimore Steam Packet Co.

For more information on Quadrimaran Circle 150 on Reader Service Card

Change In Management At West State

An agreement has been reached between shareholders, lenders and management of West State, Inc. (WSI), one of the major ship repair companies at the Port of Portland Ship Yard, to restructure control and management.

Tore Steen, president and CEO, has taken control and management of WSI through a newly established entity called West State International Inc. (WSII). He will manage WSI's entire operation at the Portland Ship Yard in Portland, Ore. Mr. **Steen** and **Doug Watson**, who founded WSI in 1986, agreed for Mr. **Watson** to manage some of the holding company's other activities. This includes the operation of Astoria Metal Corp., which was recently awarded the ex-USS *Hornet* for scrapping or conversion.

For more information on West State, Inc. Circle 64 on Reader Service Card

Maritime Reporter/Engineering News

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Sembawang Wins \$26 Million Bulk Carrier Contract

Sembawang Engineering Pte. Ltd., a unit of Sembawang Corp., won a \$26.2 million contract to build a bulk carrier, the company said. The contract was awarded by the Swiss shipping company, Suisse Atlantique. The 28,500-dwt vessel is due for delivery in mid-1996. It will be built to carry a range of bulk cargo including timber.

The contract was the first bulk carrier job for the engineering company, whose specialty is building oil rigs and chemical transport tankers.

For more information on Sembawang
Circle 74 on Reader Service Card

Hostrup Forms International Marine Services

Hank Hostrup, formerly in charge of sales, estimating and contracts for Offshore Shipbuilding (a subsidiary of McAllister Towing, N.Y.), has dedicated himself to full time directing his own company, International Marine Services of Jacksonville, Fla. Mr. **Hostrup** is not a newcomer to the marine industry, having sold his company, Putnam Shipbuilding Inc., to McAllister towing in 1980 after 10 years of building all types of steel vessels from 60 to 100 ft. (18 to 30 m) in length. Prior to moving to Florida, Mr. **Hostrup** was a partner in H.M. Tiedemann & Co., Naval Arch. & Marine Engineers.

For information on
International Marine Services
Circle 80 on Reader Service Card

New Appointments In Keppel Group



Toh Ko Lin

Leong Kang Chuen

Singmarine Industries Ltd., a member of the Keppel Group, has appointed **Toh Ko Lin** as its executive director, taking over the position of **Leong Kang Chuen**, who has assumed a new position as managing director of Keppel Cairncross Shipyard Ltd., a new joint venture shipyard based in Brisbane, Australia. Mr. Toh started his career with Keppel Group in 1975, and moved onto Gul Engineering as engineering and yard manager. He eventually returned to Keppel Corp. as business development manager in 1989 after earning an MBA.

For Mr. **K.C. Leong**, this is the second time setting up an overseas yard for Keppel. He was responsible for the building of Chokhani Shipyard in Madras, of which he

was president from 1989 to 1991. He joined Keppel in 1969 and has extensive experience in shipyard operations, construction and re-activation.

Also, **Leong Yew Kong** is the new director/general manager at Arab Heavy Industries. He was formerly yard manager at Keppel Shipyard's Harbour Yard at Telok Blangah Road. Having been with Keppel Shipyard since its incorporation in 1968, Mr. **Y.K. Leong** has

served as executive vice president of Keppel Philippines Shipyard, and as general manager of Singmarine Dockyard & Engineering Pte. Ltd.

EU Probes Spanish Engine Group Subsidies

The European Union (E.U.) Commission will investigate a \$5.6 million loan from the Basque govern-

ment to marine diesel engine maker Guascor SA. The Commission found that the subsidy could distort cross-border trade in engines. In addition, it said, the subsidy is projected to raise Guascor's sales in a market which already has excess capacity.

In cases where there is overproduction, the Commission generally demands that the recipient of the subsidy cut capacity to minimize the effect on E.U. competition.

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Duddleston New NAVSUP Executive Director

Ronald J. Duddleston, executive director of Ships Parts Control Center, Mechanicsburg, Pa., has been selected as the new executive director of the Naval Supply Systems Command (NAVSUP), effective Sept. 4, 1994. He will assume the position previously held by **William H. Lindahl**.

Mr. **Duddleston** has been the executive director of SPCC since September 1988, where he was responsible for providing professional and technical advice to SPCC's commanding officer in operational matters and in developing policies affecting the command's mission. In his new position, Mr. **Duddleston** will set the technical vision for the command's future objectives and direction of technical effort. He will also serve as the senior executive consultant within the command for all technical/engineering issues affecting strategic planning, re-

sources and operational support for other elements of the Navy and the Department of Defense.

B&H Carriers To Buy Two Bulk Carriers

B&H Bulk Carriers Ltd. has an agreement to purchase two 27,000-dwt bulk carriers, the M/V *DYVI Baltic* and the M/V *DYVI Adriatic*. Terms were not disclosed.

In a press release, the company reportedly said the vessels were sisterships of the 51 percent-owned M/V *Troll*. B&H said it expects to complete the purchase within the next three months, whereupon its bulk carrier fleet will increase from three to five vessels.

GPS Vessel Tracking Demonstrated

The U.S. Saint Lawrence Seaway Development Corporation demon-

strated to a group of Congressional staff members and regional media how vessels in the future will be tracked throughout the Seaway using the technologies of the Global Positioning System (GPS).

The Corporation plans to begin using GPS, which is now under joint management of the Departments of Defense and Transportation, for its vessel tracking operations in 1997. Once implemented, the Seaway will be the first inland waterway in North America to have a GPS-based vessel tracking program. Vessel traffic management has been a basic function of the Seaway Corporation since the waterway opened in 1959, and the new technology is expected to increase the safety and efficiency of the Seaway's navigation channels.

Samsung Wins Two Ship, \$95-Million Order

South Korea's Samsung Heavy Industries Co. Ltd. won contracts from Costamare Shipping Co. of

Greece to build two 3,200-TEU containerships for \$95 million.

Samsung Heavy Industries, a unit of Samsung Group, said it will deliver the ships, 797.2-ft. (243 m) long and 105 ft. (32 m) wide each, during the first half of 1996.

Argosy Opens New Riverside Casino

Argosy Gaming Company has replaced the former *Par-A-Dice* vessel which opened in Riverside, Mo. with the new larger *Riverside Casino* built by Alabama Shipyard, Inc. of Mobile, Ala. The *Riverside Casino* is 246 ft. (75 m) long and 77 ft. (23.5 m) wide. The new vessel began operations on Aug. 12, 1994. The new Argosy *Riverside Casino* is a 75,000-sq.-ft. vessel which accommodates 1,800 passengers and crew. The new casino provides for 30,000-sq.-ft. of gaming space and currently features 58 blackjack tables, eight craps tables, and 315 video poker and blackjack machines. At press time, the company anticipated opening an eight-table poker room on the vessel's third deck in mid-September. The vessel is designed in a "Roaring Twenties" theme. The first weekend of vessel operations reflected a 20 percent increase in passenger counts.

Corps Of Engineers Offers New Port Series Reports

The U.S. Army Corps of Engineers, Water Resources Support Center, Ports and Waterways Div., has published the 1994 edition of Port Series N. 71, Ports of Memphis, Tenn.; Helena, Ark.; and Ports on Lower Mississippi River (Miles 620 to 954).

Port Series Reports delineate the Nation's principal coastal, Great Lakes and inland port and waterway terminal and transfer facilities. The publications, produced under authority of law, are intended to meet the needs of federal, state and municipal agencies; port and waterway development authorities; and others concerned with the utilization and improvement of existing terminals and the planning and development of new ones.

Port Series Report No. 71 may be purchased for \$10. Mail orders should be addressed to Port Series Reports, (CEWRC-NDC-P), Casey Building, Alexandria, Va. 22315-3868. Checks and money orders should be made payable to "Superintendent of Documents."

Crowley Announces New Service To Bahamas

Crowley American Transport will start a new container and RoRo service between Florida and the Bahamas. **Ken Tice** has been appointed to the position of director, Bahamas Service. Crowley will deploy a 42-TEU capacity RoRo vessel which has the ability to significantly increase capacity by using LoLo technology if required.

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MTW Delivers Containership, *Westerdeich*

Westerdeich, a 551.2-ft. (168-m) containership of type CC 1600, was recently delivered by MTW Schiffswerft GmbH, Wismar to owner Reederei Gebr. Peterson GmbH, Rendsburg, Germany. A sistership was launched last April, slated for delivery in September.

Built in accordance with the rules of Germanischer Lloyd (GL), the new ships reflect special attention to the issues of time-saving in loading containers, efficient arrangement and selection of container-handling gear, and optimizing space utilization inside cargo holds and the engine room.

The cargo loading area is subdivided by waterproof transverse bulkheads into four areas where containers may be stowed in 40-ft. bays that can hold two 20-ft. containers. The division of the bays helps ensure favorable installation by three electro-hydraulic 40-ton capacity cranes with 92-ft. (28-m) outreach. Generally, the vessel is built to carry 1,572 TEUs, a portion of which is carried in the cargo holds and the rest on deck.

The vessel's shape has been de-

signed to meet the task requirements for a high-draft vessel — that is, its freeboard draft will create no significant drop in speed as compared to a high-draft vessel. The design of the bulbous bow fits into this concept.

The aft ship design — including the stern bulb and the arrangement of a big propeller aperture as well as the wide deck beams in the fore and aft ship — meet current requirements for high-speed and advanced containerships.

Main propulsion is by one two-stroke diesel engine directly clutched to a low-speed diesel engine of type 6 RTA 62 by Dieselmotorenwerke Rostock, with an output of 13,000 kW.

At 90 percent engine output, the vessel achieves 20 knots. The engine is of reversible type, has two single-stage charge air coolers and two BBC exhaust-gas turbochargers of type VPR 454. The vessel is designed for operation on heavy fuel oil with a viscosity of 600 cSt/50 degrees C.

The vessel's equipment also includes an STN shaft-generator in the wave train, semi-balanced rudder and a Schottel bowthruster.

The main dimensions specified in connection with a low block coefficient CB at design draft follow the current trend toward higher-speed containerships, with moderate power increase.

The vessel is classed by GL as 100 A 5 E "Container Ship," SOLAS II-2, Reg. 54, IW, NAV-OC. It complies



MTW's recent delivery, the containership *Westerdeich*. Its sistership is scheduled for delivery in September.

with a host of international regulations applicable at the time of contract signing.

MTW projects that the next ships in the series will reflect improve-

ments in both container capacity and speed.

For more information on
MTW Schiffswerft
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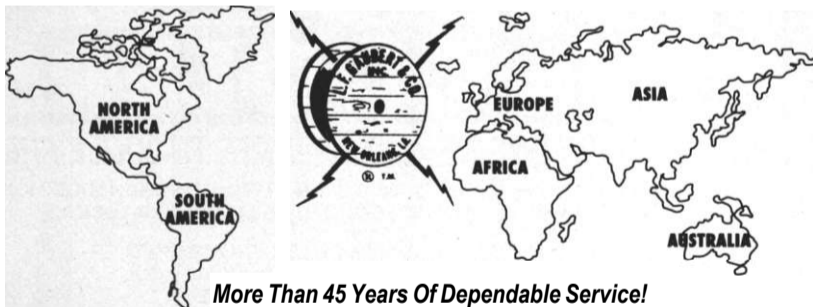
Westerdeich Equipment List

Main engine.....Dieselmotorenwerke Rostock	Air-conditioning.....Noske-Kaesser
Auxiliary engines.....MaK Kiel	Satellite communications.....Magnavox, Sailor
Shaft generator	VHF.....Sailor/IMC Japan
STNAloyd Dynamowerke Bremen	SART.....SERPE
Emergency generator.....MAN	Gyrocompass.....Anschutz
Rudder.....KGW	Autopilot.....Anschutz
Bowthruster.....Schottel	Compass.....Cassens & Platti
Stern tube seals.....Blohm + Voss	Radar.....Racal-Decca
Container securing.....CONVER	Satellite navigation.....Trimble
Aux. exhaust-gas boiler.....HTI	Radio direction finder.....Plath
Watercooling system.....APV	Loran C.....MLR Electronic
Fuel treatment.....Alfa Laval	Weather chart recorder.....Furuno
Watermaker.....Alfa Laval	Speed log.....Plath
Sewage treatment.....Hammworthy	Echosounder.....ELAC
Engine controls.....STN	Navtex receiver.....JMC/Japan
Intercom.....STN	Navigation lamps, signaling
Cathodic protection.....Jotun	lights and searchlights.....Aqua Signal

Westerdeich Specifications

Length, o.a.....	551.2 ft. (168 m)
Breadth, molded.....	87.6 ft. (26.7 m)
Depth.....	47.2 ft. (14.4 m)
Design Draft.....	31.8 ft. (9.7 m)
DWT at	
Freeboard draft.....	22,300 t
Container capacity.....	1,572 TEUs

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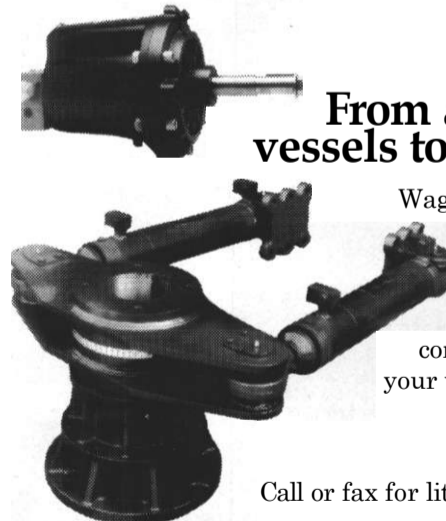
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Larger Vessels — Good Or Bad For The Liner Industry?

Report: Liner Companies Face Many Challenges To Survive Beyond 2000

A report entitled "50 Major Liner Companies" released by Dynamar Overseas, Inc. provides an analysis of 50 liner companies, along with an overall assessment of the market and the challenges it faces.

According to the report, for example, the shipping industry in general and the liner companies in particular are facing difficult times due to: too much focus on TEUs carried rather than the bottom line; increased strength of shippers/shipper groups to join forces in negotiating with shipping conferences/individual lines; a worldwide recession; market saturation by commodities

from the Far East, and efforts to revive local production in Europe and the U.S.; and too many empty movements — the report found that 20 percent of the containers carried/handled are without cargo.

The advent of larger ships coming on line, often replacing smaller vessels, combined with the fact that the smaller vessels being replaced are often sold for further trading to independent carriers, instead of being sent to the breakers, is having a negative impact on the overall health of the industry. The author of the report notes the vessels in the 4,400- to 4,950-TEU range currently com-

ing into service, and the ease to which these vessels could be jumboized to capacities of 6,000 TEU. The report maintains, obviously contingent on port capacity and accessibility, that in the future vessels of 8,000 TEU could become feasible.

The report also analyzes the three major trade routes, providing a statistical analysis of past performance and 1994 projections, in determining the needs for these routes in the near and long-term future.

For information on obtaining "50 Major Liner Companies" Circle 83 on Reader Service Card

Steamers Forms Joint Venture To Operate Port

Steamers Maritime Holdings Ltd., a member of the Keppel Group, signed an agreement to form a joint venture with a Chinese company to operate a port as well as provide shipping, distribution and warehousing services in Foshan, Guangdong province, China.

Players To Add Capacity To Riverboat Casino

Players International has commenced construction to expand operations at its *Lake Charles*

Riverboat Casino. The fourth deck of the riverboat will be enclosed to meet increased weekend demand, adding about 1,600-sq.-ft. of gaming space. Players received permission from the State Riverboat Commission to operate dockside while under construction, which will allow patrons to board the riverboat any time during operating hours.

The cost is set at \$1 million and is expected to be complete in two months.

Carrier Transicold Supplies "Green" Chillers For Navy

Carrier Transicold's Marine Systems Group has received offers from

National Steel and Shipbuilding Co. (NASSCO) of San Diego and Newport News Shipbuilding (NNS) of Newport News, Va. for a total of 19 centrifugal air conditioning chillers charged with chlorine-free R-134a refrigerant. The chillers will be used in commercial ships being converted to high-speed military sealift vessels for the U.S. Navy's Military Sealift Command. NASSCO will convert three, NNS two.

Ten of the systems will incorporate Carrier's new automatic Chillervisor Control System and special General Electric stand-alone starter equipment.

For more information from Carrier Circle 87 on Reader Service Card

Two-Passenger Submarines Delivered To French Owner

Deep Ocean Engineering, Inc. delivered a pair of its new two-passenger Deep Rover Model DR1002 manned submersibles to Aquaplus, a French Societe Anonyme. The design is similar to its one-person Deep Rover, first built in 1984, but with many improvements.

Normal pilot access is made while the submersible is on the deck of the ship, but the design allows for a safe emergency exit when the submersible is in the water, even in rough seas.

For more information Circle 88 on Reader Service Card

Southwest Marine Wins AEGIS Excellence Award

Southwest Marine, Inc. — specialists in the repair, maintenance and overhaul of government and commercial oceangoing vessels — was presented with the AEGIS Excellence Award.

The award, presented by the Navy during a special ceremony, was given for outstanding performance on the first regular overhaul (ROH) of the USS *Valley Forge* (CG-50), a Ticonderoga/AEGIS class cruiser home-ported in San Diego.

The shipyard was commended for leadership in maintaining tight scheduling requirements, despite numerous contract changes, and completing the availability within eight months.

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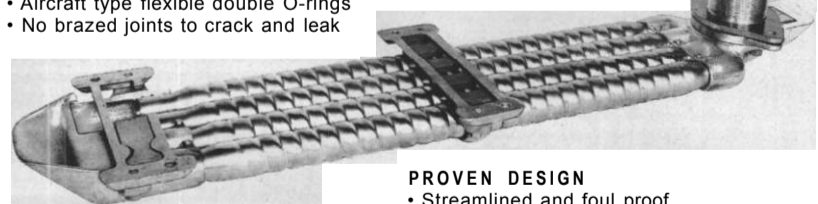
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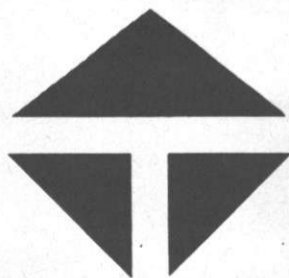
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Circle 296 on Reader Service Card

Propulsion Machinery Review

by Graeme MacLennan,
international editor

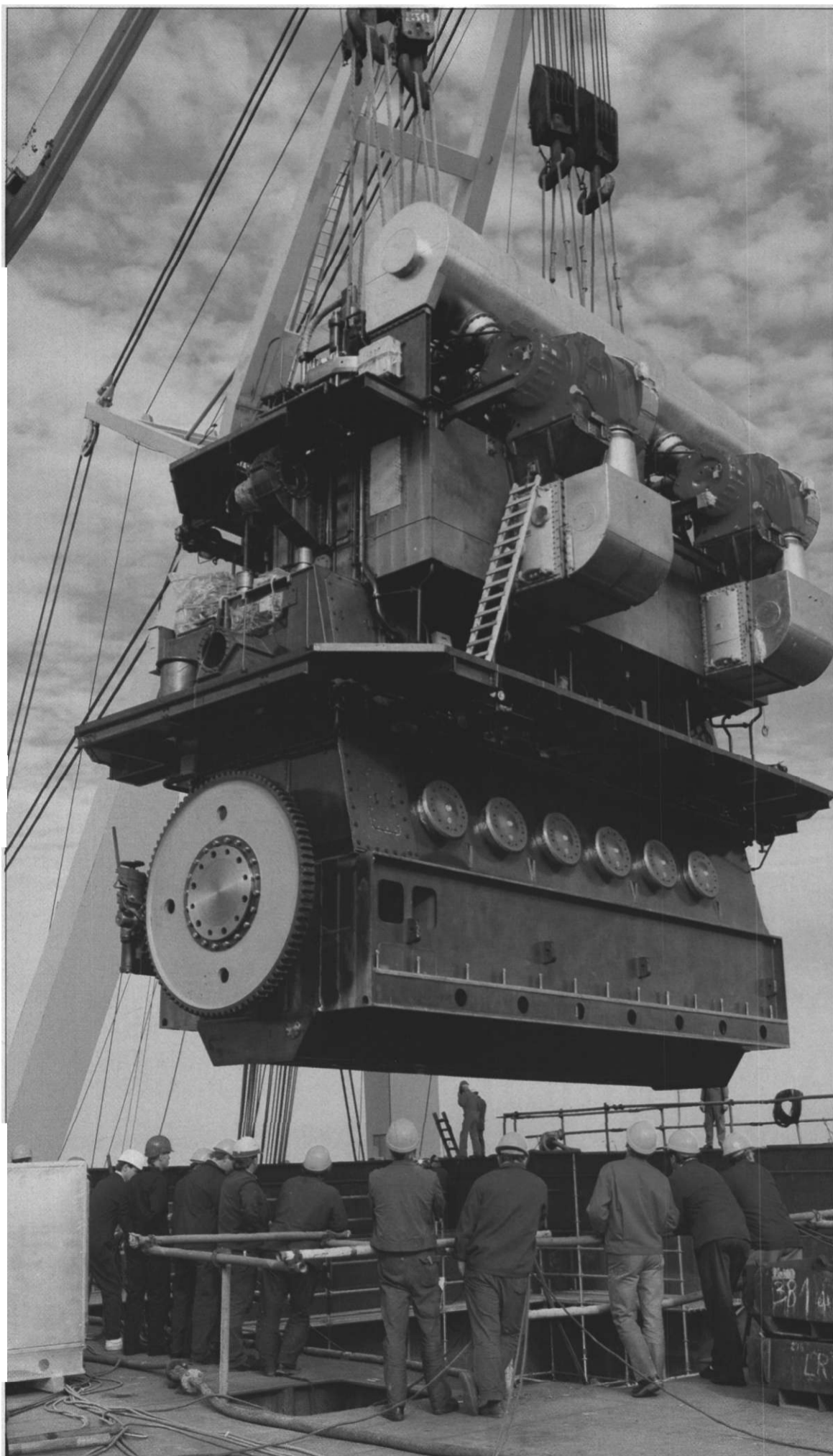
Propulsion machinery makers are keeping ahead of the market, and are well able to meet the requirement for increasing unit powers and operational flexibility with high economy. A difference of 2 g/kW-h in fuel consumption may not sound like very much, but when associated with an engine developing a continuous 40 MW over a trans-Pacific voyage, it will amount to nearly two tons per day. The design of large engines has reached a plateau, with only modest year-by-year improvements to performance. Activity is devoted to extending the time between necessary overhaul and inspection, ease of maintenance and the life of working parts. Builders of engines of all sizes, and gas turbine makers, have had to devote much time and attention to the quality of exhaust gases. A number of port authorities already have legislation in force for limiting No_x, So_x and particulate emissions, and those composed in *The State of California* are very strict. Checking presents an enforcement problem when applied to a ship moving within port limits and with the machinery operating at various powers. However, controls will come into force generally and the IMO has drawn up a timetable of recommended limits.

Crosshead Diesel Engines

Past months have seen feverish activity in ordering very large and fast containerships, maximum capacity having now exceeded 5,000-TEU in the most recent contract for five 5,046-TEU, 24.5-knot ships for Hyundai Merchant Marine of South Korea. These will be built and engined in the associated Hyundai Heavy Industries plant at Ulsan. Vessels of this order call for machinery of the highest output and the engines specified are the recently uprated Mark V versions of MAN B&W's 12-cylinder 12K90MC-C model, currently the most powerful available on the market. This has an MCR of 54,720 kW (74,520 bhp) at 104 rpm, and will probably be operated at about 47,000 kW (64,000 bhp) on the long continuous runs across the Pacific, if the same margin is applied as in the six 4,400-TEU Hyundai ships of late 1992 and last year. New Sulzer Diesel is enjoying considerable success with its most powerful containership model, the RTA84C, having two ships in service with 12 cylinders and 11 more on order, including one for six with an MCR of 48,600 kW (66,120 bhp) for ultra-Panamax 4,960-TEU ships ordered by Oriental Overseas Container Line in Japan and South Korea. The most popular size is the nine-cylinder version, of which 36 have been ordered.

Although specifications of proposed 6,000-TEU ships have already been circulated, it is felt that the

(Continued on page 61)



Mounting of a DMR-built 7RTA72U, 20,930-kW engine in the container vessel *BV 3000* at MTW Shipyard.

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Member of





Vessel:Team One GB36 RIB
 Type:Assault RIB
 Builder: American Eagle Mfg.
 Engines:Caterpillar
 Waterjets:North American Marine Jet

A group of noted marine industry leaders has created the Team One GB36 Rigid Inflatable Boat (RIB) assault craft. American Eagle Mfg., Inc., LaConner, Wash., constructed the 37-ft. (11,3-m) RIB, with 3/8-in. boat bottom and solid foam collar. Caterpillar supplied the diesel engine, model 3176 with electronically computerized control system, reportedly providing extremely efficient, lightweight 500-hp diesel power. North American Marine Jet, (NAMJ) Inc. equipped the vessel with the Nomera 20 Jet propulsion unit, built to deliver cavitation-free thrust at speeds from 0 to 60 knots. The craft is being tested by the U.S. Navy and has potential for serving many of their high-speed craft demands — and has attracted the interest of the Marines and the U.S. Coast Guard, as well.

Vessel:*Juan J. Sister*
 Type:RoRo passenger ferry
 Builder: Kvaerner Masa-Yards
 Owner:Compania Transmediterranea SA
 Main engines:Wartsila Vasa
 Auxiliary engines: Wartsila Vasa
 Emergency generator:MAN
 Gears: Lohmann & Stolterfoht
 Propeller:Lips
 Side thrusters:Lips



Juan J. Sister, which was delivered last year to the Spanish government-owned Compania Transmediterranea SA from Kvaerner Masa's Turku New shipyard, is the first Spanish ship built in Finland. Specifically designed for operation between Spain and the Canary Islands, the vessel features an impressive list of propulsion manufacturers, including Wartsila, Lips and Lohmann & Stolterfoht. At 496 ft. (151.2 m) long, the vessel has a beam of 85.3 ft. (26 m) and a draft of 19.7 ft. (6 m). The 5,500-dwt vessel's four Wartsila Vasa 8R32E diesel engines generate 3,150 kW each at 765 rpm, carrying *Juan J. Sister's* maximum of 400 passengers at a speed of 18 knots — achieving maneuverability via two flap rudders and two bowthrusters. *Juan J. Sister* flies the Spanish flag and is classed by Bureau Veritas.

Vessel:*Wild Thing*
 Type:Fast Air Supported Trimaran (FAST-1)
 Builder:Todd Marine
 Main engines:Caterpillar
 Gears:ZF
 Propeller:France Heliz
 Shafts:Aquamet

The design of *Wild Thing*, built by Todd Marine in Norfolk, Va. and designed by Joshua W. Johnson, the design has applications including everything from offshore/oil rig support to drug interdiction and military uses. Three long hulls with a flat bottom and five-degree trim angle for lift, two tunnels with decreasing volume from bow to stern for lift, and a large flat deck for carrying anything from people to freight constitute the *Wild Thing's* design. Caterpillar main engines drive France Heliz propellers through ZF reduction gearboxes for a speed of 45 knots. The *Wild Thing* is reportedly the fastest 150-passenger U.S. Coast Guard-certified bchapter T-L vessel (approved for 150 passengers at 45 knots).

Vessel:*Vargoy*
 Type: "Flying Cat" catamaran
 Builder:Kvaerner Fjellstrand
 Owner:Finnmark Fylkesrederi
 Engines:MTU
 Waterjets:Kvaerner Energy



The *Vargoy* is a 131.2-ft. (40 m) Flying Cat currently operating for Finnmark Fylkesrederi between Hammerfest and Honigsvag in the far north of Norway. Built by Kvaerner Fjellstrand, it is the very first vessel to be fitted with Kvaerner

Energy-designed and -built 680 mm waterjets, each with an MCR of 2,000 kW, but service-rated at 1,800 kW. The vessel is powered by two MTU 396TE74Ls.



Vessel:*Norasia Kiel*
 Type: Open-topcontainership
 Builder:HDW
 Owner:Norasia Schifffahrts
 Main diesel engine: Mitsubishi
 Aux. diesel:Yanmar
 Emergency diesel:Caterpillar
 Propeller:Lips
 Bowthruster:KaMeWa
 Rudder:Becker
 Separators:Westfalia

The *Norasia Kiel* is the second of a new class of "open top" containership built by Howaldswerke-Deutsche Werft AG (HDW) of Kiel, Germany for owner Norasia Schifffahrts, GmbH. HDW says the slow-speed, 2-stroke diesel, Mitsubishi 7UEC 85 LSC engine plant driving a fixed-pitch Lips propeller is economical, reliable and easy to maintain. The engine has a nominal output of 27,290 kW (37,100 hp), with 102 min rpm and a low specific fuel consumption of 165 g/kWh (121 h/hp). Fully laden, the vessels have a service speed of 22.5 knots with the main engine running at 90 percent MCR and 15 percent sea margin. In its trials, the *Norasia Fribourg* achieved a speed of 24.2 knots. The ships are also fitted with a Becker rudder and a 1,300-kW bowthruster to improve maneuverability.

Vessel:*Garth Foss*
 Type:Tractor tug
 Builder:Trinity
 Owner:Foss Maritime
 Main engines:EMD
 Propulsion:Voith-Schneider cycloidal



Trinity's *Garth Foss* was preceded by sistership *Lindsey Foss* — and according to Trinity, the 155-ft. (47.3-m), 8,000-hp enhanced tractor tugs are the largest and most powerful tugs in the world. Fitted with a Voith-Schneider cycloidal propulsion system and powered by a pair of GE EMD ME 16-710 G7A main diesel engines, *Garth Foss* will work for BP Oil Shipping Co., escorting tankers in the Straits of Juan de Fuca and Puget Sound. *Lindsey Foss* is already engaged in similar work for Arco Marine. Voith's system consists of two sets of vertically-oriented blades installed ahead of the tug's center, giving the tug 360-degree maneuverability and the ability to steer and stop tankers in the event of an emergency. A turbo coupling between the engine and reduction gear replaces a clutch.

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support to drug interdiction and military uses. Three long hulls with a flat bottom and five-degree trim angle for lift, two tunnels with decreasing volume from bow to stern for lift, and a large flat deck for carrying anything from people to freight constitute the *Wild Thing's* design. Caterpillar main engines drive France Heliz propellers through ZF reduction gearboxes for a speed of 45 knots. The *Wild Thing* is reportedly the fastest 150-passenger U.S. Coast Guard-certified bchapter T-L vessel (approved for 150 passengers at 45 knots).

Marine Propulsion Technology

(Continued, from page 58)

present range of engines will suffice, unless a strongly competitive element arises in the freight market, in which case resort will have to be made to twin-screw propulsion.

These large engines are increasingly adopted for central electricity-generating stations serving island populations; the wider market helping to spread development costs.

Mitsubishi has its first examples of large faster-running engines at sea in containerships, a new class of Norasia vessels built in Germany of open-hatch design with innovative rain shelters.

These have Mitsubishi 7UEC85LSC engines of 29,290 kW (37,100 bhp) at 102 rpm, moderated to 90 percent for a continuous sea speed of 22.5 knots. The UEC33 engine, introduced in replacement of the 370mm bore model, has also been sent to sea, in a day-cruising ship.

The smaller-bore crosshead engine sells very well in Far Eastern markets for large coasters and inter-island traders. MAN B&W is making a bid for sales in Europe, offering models with two-cylinder sizes as robust and economical alternatives to the medium-speed engine.

Both the 35MC and the 42MC have been redesigned as S-prefix models, to incorporate most of the piston strokes so that propeller speeds more nearly match those of a comparable medium-speed engine and gearbox.

While more expensive, a long-term economic balance taking into account potentially greater cargo space due to the shorter plant, lower fuel consumption, maintenance and spares shows to advantage in a number of situations which are the usual application for geared machinery: large coasters, small tankers and container feeder ships.

The S42MC has a stroke/bore ratio of 4.2:1, the highest of any production engine today. It is to be made with from four to 12 cylinders, developing 1,025 kW (1,395 bhp) per cylinder at 136 rpm.

The crosshead diesel engine is universally adopted for propelling large tankers. It is estimated that 30 to 40 VLCCs will have been scrapped by the year's end, leaving 450, of which a number are known to be unacceptable to the leading oil companies.

Some 25 new VLCCs will have come into service, leaving a substantial market to be met.

Recent developments by Sulzer, MAN B&W and Mitsubishi now enable an engine to be run at near the MCR on loaded voyages, and immediately and readily tuned for optimum performance and much reduced power for the return light-draft passage.

This is achieved by electronic intervention of the fuel injection and has exchange timings.

Medium-Speed Diesels

The medium-speed diesel engine builders have not been idle. A number of European makers have presented entirely new models, and others have introduced significant modifications of existing engines. All three crosshead engine builders have

important medium-speed activity, notably MAN B&W with its home base in Augsburg building a successful range of three sizes of geometrically similar heavier models (joined recently by the junior 32/40 series) and the popular 230 and 280mm bore models from Frederikshavn and Holeby in Denmark.

In each case, the new engines have been designed to reduce emissions, improve economy and sim-

plify the manufacturing process.

The Stork-Wartsila SW38—with a 380mm cylinder bore and a 475mm piston stroke of 660 kW per cylinder at 600 rpm, developed at the Zwolle works with the backing of the Wartsila Diesel Group — will ultimately take over from the popular and long-lived TM410 series. Available in models from six to 18 cylinders, the engine covers an output range from 4,000 to 12,000 kW. Orders have been received, and se-

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Two totally different applications deserve 1 equally different jets. A high speed jet should be efficient in the range of 25 to 60 knots. A low speed jet should offer zero cavitation at full power from 0 to 25 knots. One utilizes high velocity . . . the other mass flow. A jet drive built to combine the two will suffer in performance. But is there a manufacturer who makes two such radically different Jet Drives?

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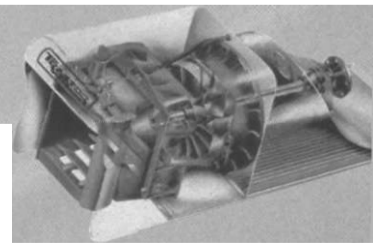
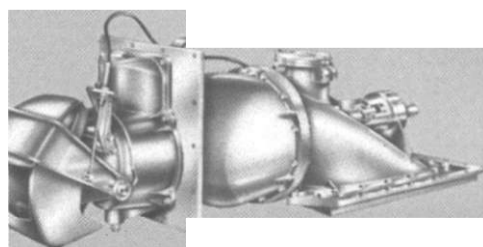
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TRAKTOR®

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Marine Propulsion Technology

ries production is ready in Amsterdam in the factory on the historic site of Werkspoor, one of Dr. Diesel's original seven licensees at the turn of the century.

Krupp-MaK presented its M32 at Kiel, a middle-weight model available in models from six to 16 cylinders in a power range from 2,640 to

7,040 kW at 600 rpm. (The shorter stroke vee engines run at up to 750 rpm). These engines will have optional equipment for rephasing the camshaft timing, to maintain optimum efficiency with reduced emissions, over a range of speeds and fuel quality.

MAN B&W's offering, the six- to

nine-cylinder L 32/40 range is in production and examples are already at sea. This is the model which features a camshaft dedicated to actuating fuel pumps, and another at the back of the engine for controlling the gas exchange events, both of them with provision for rephasing the timing.

The designation SEMT-Pielstick PC2-6B does not sound like that of a new model, but in fact covers the first PC2 engine to have cylinder dimensions different from the 400 mm by 460mm used by Dipl.-Ing. Gustav Pielstick as far back as the early 1950s. The PC2-6B develops 630 kW/cyl. at 530 rpm, and four 18-cylinder engines have been specified for the new and largest French mainland to Corsica ferry building at St. Nazaire. All in-line and vee-form models will have cast iron frames for stiffness and lower noise emission values. The cylinder liner is carried directly in the frame, and not within its own jacket, and cooling is applied only at the upper part and through bored passages at the top. The Deutz-MWM 632 series is a faster-running 255mm x 320mm model to cover a range of powers from 1,440 to 6,330 kW. This is another which fills a gap in the builder's power/speed plan. Perhaps the most interesting item in this connection is that all of the vee-form versions will be assembled at a new plant being set up in Grove City, Pa., in cooperation with General Electric Transportation System.

From Japan has come news that the five-year development program of a very highly rated medium-speed engine, to develop 1,485 kW per cylinder, has been concluded with trials sufficiently promising to lead to production. No physical details have been released, but high claims are made for reliability; fuel consumption (10 to 15 percent lower); bmep (20 to 50 percent higher); piston speeds up to 12m/s; and specific weight (40 to 50 percent lower). The remarkable advances in bmep and piston speed have been achieved by applying porous ceramic shielding to the piston crowns, and anti-wear and high-slip ceramic plasma coatings to the cylinder liners and piston rings. This development has been undertaken jointly by Mitsui, Kawasaki and Hitachi, supported by a number of government agencies.

Mgh SpMd Diesels A Gas TerMees

The large and fast lightweight ferry for passengers and cars has rapidly become a significant factor in certain areas of marine transportation. These craft are weight-sensitive and require concentrated levels of power which can only be met by high-performance diesel engines and/or aero engine-derived gas turbines, generally driving water jets due to their shallow draft.

MTU can provide diesel engines of high power. The two Tirrenia ferries each have two of the latest 16V 595 engines driving the outer, steerable water jets and an MTU-GE LM2500 gas turbine driving the center one. Engines of lower output already in service have been supplied by Ruston, Caterpillar, Deutz MWM, Niigata and Mitsubishi.

The GE family of gas turbines is well established at sea in the navies of many countries. Next year the first of the Stena HSS light alloy

From 1995, the Heidrun production field will be served by three 124,000 dwt shuttle tankers under a Statoil charter contract; two of these owned by Knutsen O.A.S., and one by Conoco. All three feature an electric propulsion and power plant supplied by ABB.



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catamarans will enter service across the Irish Sea. Very large, these craft will carry 1,500 passengers and 375 cars (or 50 trucks and 100 cars) at speeds up to 40 knots, propelled by one LM2500 and one LM1600 GE gas turbine coupled in a unique COGOG configuration to drive two KaMeWa water jets in each hull, a total of 80,000 kW. Three HSS' are on order from Finnyards, and the turbine modules and installations are in the hands of Kvaerner Energy A/S of Norway, a long-time GE manufacturing partner.

The Pratt & Whitney Turbo Power & Marine Div. has returned to the scene. The company will supply the "core" gas generator for the Mitsubishi 24,280-kW MFT-8 gas turbine which will be installed in the half-scale prototype Techno Superliner, a 1,000-dwt, 50-knot freight carrier.

Smaller turbines are the Solar Taurus of 5.2 MW for five TriCat ferries, and the Textron Lycoming TF-40, a 3,000-kW unit already in service and specified for three Hong Kong ferries. Ulstein's 2.6 MW Eurodyne is completing its prototype trials.

IMIRK Drives

With few exceptions diesel-electric propulsion has been specified for all of the larger cruise ships placed on order during the past two years; not for the reasons of its brief popularity 60 years ago when it was offered as a means of overcoming then-prevalent problems, but in its own right for the very clear advantages which it offers.

A cruise ship, as opposed to the vanished passenger liner, has an operating regime which calls for a wide range of speeds — running fast out to warmer waters and thereafter perhaps at very moderate speeds over short distances between venues on the cruising grounds. The amenities expected today make a heavy demand on auxiliary power for hotel services and air-conditioning all the time that passengers are on board, which is almost continuously, between docking periods.

The high-powered bow and stern-thrusters which enable these larger ships to enter and anchor safely in confined harbors and bays without tug assistance represent another demand.

It is only in recent years that the "power station" principle, in which there are no dedicated auxiliary generators, has been developed.

This highly-flexible arrangement of several generators, of the same or different outputs and driven by medium-speed diesel engines, enables the full range of power requirements from high speed in tropical waters to harbor in temperature climates to be accommodated by running the minimum number of sets under the optimum load conditions. A modern power management system maintains this state, while keeping the minimum "spinning reserve" to meet any naviga-

tional emergency requirement for sudden increase of speed or crash-astern.

Electric transmission was once popular in ferries for the ease and flexibility of maneuvering which the system offered, benefits later conferred by the combination of engines of higher unit power and control-

lable-pitch propellers.

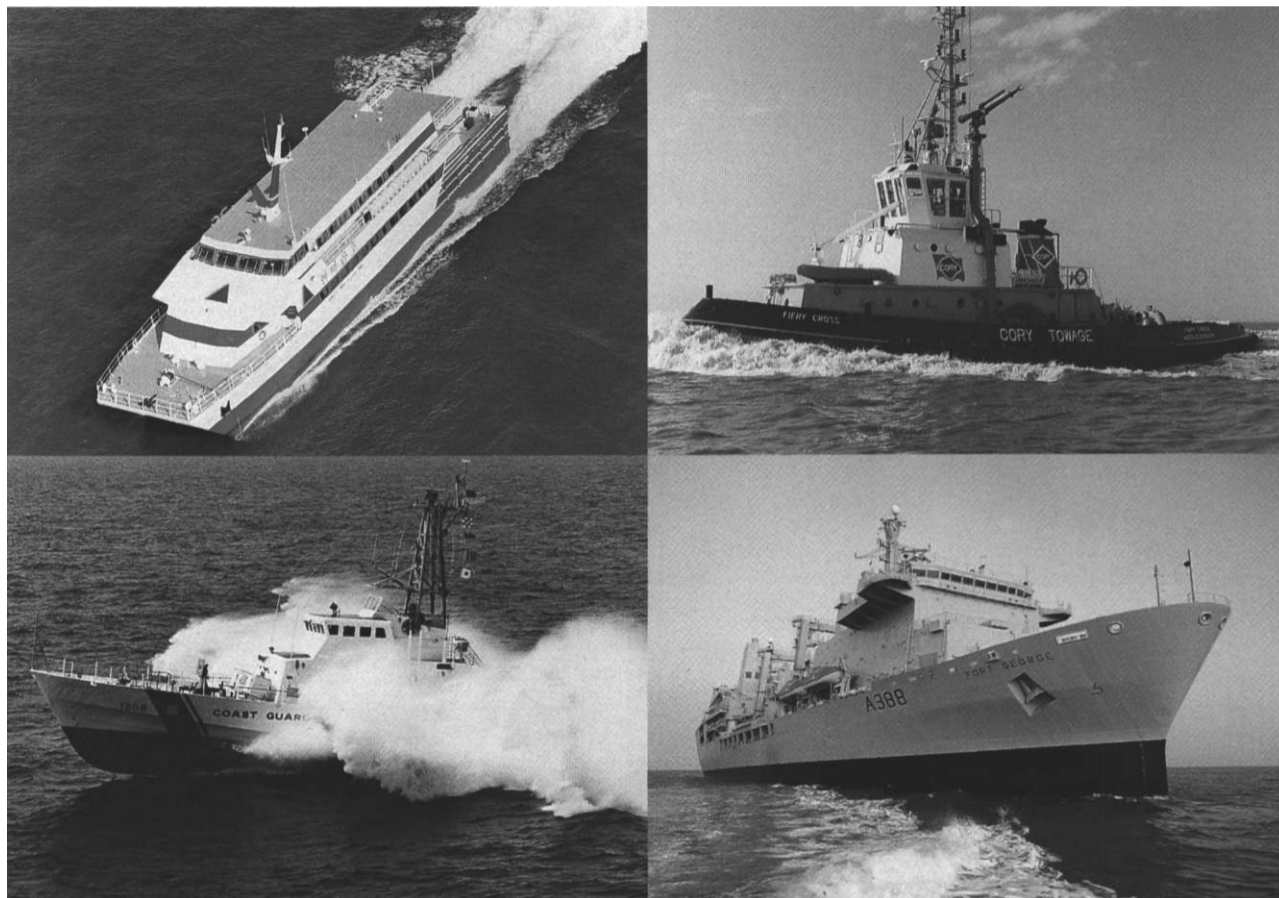
However, a contract placed with Finnyards for two advanced trailer ferries to operate in the environmentally-sensitive waters between Germany, Denmark and Sweden has been specified with diesel-electric machinery powered by four MaK 6M 552 engines burning a low-sul-

fur MDO grade of fuel. This order is of significance, as it marks the return of one of the major participants to this field, after a number of years of absence.

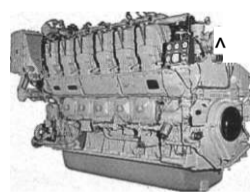
The propulsion outfit will be supplied by Systemtechnik Noord (STN) whose subsidiary AEG, notable for

(Continued on page 71)

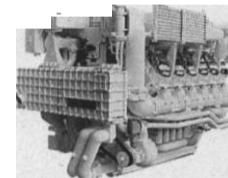
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Telephone UK + 44 925 225151 Fax UK + 44 925 222055

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Marine Propulsion Technology — Supplier Directory

The following is a select list of propulsion-related manufacturers and the products they provide. Every effort has been made to provide a complete, correct directory. However, the publisher is not responsible for errors or omissions.
Source: *Maritime Reporter & Engineering News*

ABB Industrial Systems Inc.
100 Madison Corporate Park, Rte. 6
Brewster, N.Y. 10509 USA
Contact: Robert Sarnelli

Tel: (914) 278-6810
Fax: (914) 278-6841
Diesel engine monitoring systems

ABB Industry Oy/Marine Division
PO Box 185
00381 Helsinki, Finland
Contact: Thomas Hackman, marketing mgr.
Tel: (+3580) 564 2110
Fax: (+3580) 564 2350
Electric propulsion and power plants

ABB Turbo Systems Ltd.
CH-5401 Baden, Switzerland
Contact: Paul Russak
Tel: +41 056 75 5152
Fax: +41 056 75 5144
Diesel engines

ABB Turbocharger Co.
1460 Livingston Avenue
N. Brunswick N.J. 08902 USA

Tel: (201) 932-6241
Fax: (201)932-6378

Alaska Diesel Electric
4420 14th Avenue NW PO Box 70543
Seattle, Wash. 98107 USA
Contact: Kurt Hoehne
Tel: (206) 789-3880
Fax: (206) 782-5455
Diesel engines, gensets

Allison Engine Company, Inc.
2001 S. Tibbs, PO Box 420
Indianapolis, Ind. 46206-0420 USA
Gas turbines

American Hydro Jet Corporation (Amjet)
2033-F West McNab Road
Pompano Beach, Fla. 33069 USA
Contact: Paul W. Roos
Tel: (305) 978-8996
Fax: (305) 978-6597
Waterjets

Aquamaster-Rauma Inc.
2315 N. Woodlawn Ave. Suite 103
Metairie, La. 70001 USA
Tel: (504) 883-8340
Fax: (504) 883-8344
Thrusters, Z-drives, contra-rotating propellers, deck equip.

Aquamaster-Rauma Ltd.
PO Box 220
FIN 26101 Rauma, Finland
Contact: Esa Uotinen
Tel: +358 38 3791
Fax: +358 38 379 4804
Thrusters, azimuth thrusters

Berg Propulsion AB
Box 1005 S-43090 Ockero Sweden
Contact: Claes Elfstrom
Tel: +46 31969020
Fax: +46 31969456
Thrusters, propellers, gears

Bird-Johnson Company
3719 Industrial Road
Pascagoula, Miss. 39581 USA
Contact: James B. Travis
Tel: (601) 762-0728
Fax: (601)769-7048
Propellers, thrusters, waterjets

Braunschweiger Huttenwerk GmbH
Alte Leipziger Str. 117-118
D-38124 Braunschweig, Germany
Contact: P. Bhattacharya
Tel: +49 (0)531-2605-0
Fax: +49 (0)531-2605-300
Plain bearings for diesel engines, compressors, turbines & gears

Brunvoll AS
Strandgata 4-6
N-6400 Molde Norway
Contact: Terje Dyrseth
Tel: +47 72 51 966
Fax: +47 72 53 424
Thrusters, propellers, drive system packages and thruster control systems

Caterpillar Inc., N4-NOS112
PO Box 610
Mossville, Ill. 61552 USA
Tel: 1-800-321-7332/(309) 578-8143
Fax: (309) 578-2559
Diesel engines

Centa Antriebe Kirsche GmbH
Postfach 1125 - D-42755 Hann
Bergische Str. 7 - D-42781 Haan Germany
Contact: Mr. Hessling, Mr. Sonnen
Flexible couplings, flexible shafts, flexible couplings for propeller thrust, centrifugal clutches

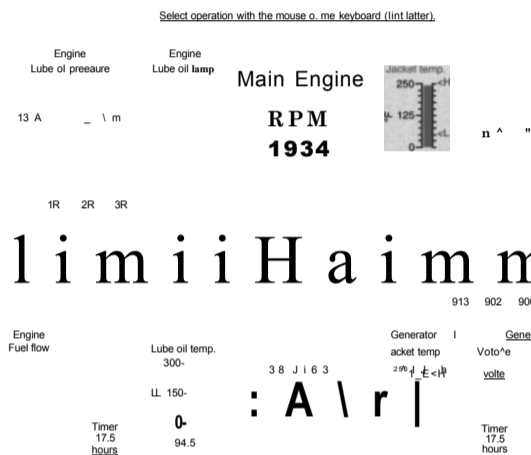
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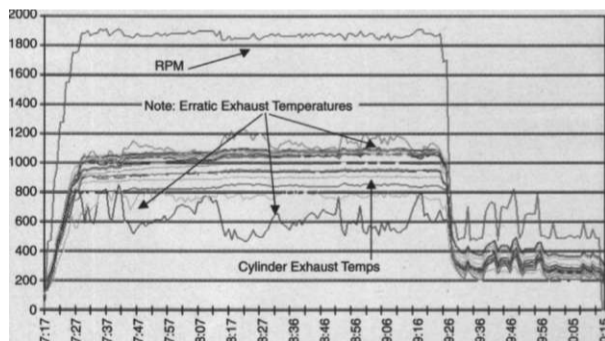
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Any ship can be fitted with a standard annunciator panel with digital readout, switches and lights. But the ERNASKO Monitoring System is *state of the art* equipment and software. *Pulsed frequency techniques in all components* eliminate electrical interference. *Special expansion boards* mate all components to a *standard 486 computer for full-color graphic display*. *Alarm conditions appear immediately in red on the screen* and also as audible alarms if desired. *Stored data easily converts to graphs for rapid analysis*. Manual logging is no longer required.

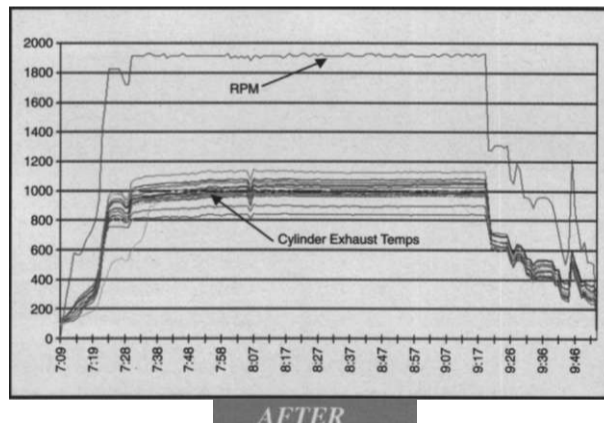
The Display is easily tailored to match your requirements. Entire system operates with a track-ball or mouse, eliminating the need for a keyboard. You can learn to operate the system in less than five minutes!



Customized screen shows all vessel conditions in graphical and digital format. Hi-Lo alarms are shown on all functions. All cylinder exhaust temperatures are mid-screen.

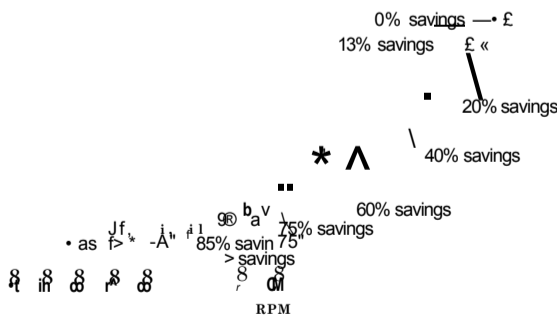


Graphic format is easily produced from stored data. Note low and high erratic temperatures on two cylinders indicating imminent injector failures. Pre-existing System indicated no problem.



Left: System data allows calculation of fuel vs. Engine RPM. Fuel consumption for Detroit Diesel 16V149 is shown following tune-up.

FUEL CONSUMPTION - Detroit Diesel 16V 149



ERNASKO, INC.

18717 - 76th Ave. W. Suite E.
Lynnwood, WA 98037 USA
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 Fax: +46 40 214068
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Cincinnati Gear Co.
 5657 Wooster Pk.
 Cincinnati, Ohio USA
 Contact: Steve Crowell, marketing manager
 Tel: (513) 271-7700
 Fax: (513) 271-0049
 Marine propulsion systems, epicyclic units, reverse gearing

CKD USA (Agents: Tripes Materials)
 1173 B Persimmon Ave.
 El Cajon, Calif. 92021 USA
 Contact: George Tripes
 Tel/Fax: (619) 442-7005
 Diesel generator sets, Vulcan couplings

Cleveland Gear Co.
 3249 E. 80th
 Cleveland, Ohio 44104 USA
 Contact: Clark Wormer (strainers), Bill O'Farrell (gears)
 Tel: (216) 641-9000
 Fax: (216) 641-9080
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Crucible Service Centers
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 Camillus, N.Y. 13031-0991 USA
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 Fax: (315) 487-4028
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Cummins Marine
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 Charleston, S.C. 29405 - 8521 USA
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 Tel: (803) 745-1615
 Fax: (803) 745-1549
 Diesel engines

Cummins Mid-South Inc.
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 Kenner, La. 70062 USA
 Contact: Calvin B. Klotz, Jr.
 Tel: (504) 468-3535
 Fax: (504) 465-3408
 Diesel engines

Daihatsu Diesel Mfg. Co., Ltd.
 4-14, Tokui-Cho 2-chome
 Chuo-Ku, Osaka 640 Japan
 Contact: Marine Diesel Engine Sales
 Tel: +81 06 945 5331
 Fax: +81 06 945 5308 9
 Diesel engines

Daytona Marine Engine Corp.
 1815 North U.S. 1
 Ormond Bch., Fla. 32174
 Tel: (904) 676-1140
 Fax: (904) 676-0164
 Diesel engines

Deere Power Systems
 3801 West Ridgeway Avenue
 PO Box 5100
 Waterloo, Iowa 50704-5100 USA
 Contact: Tom Withers
 Tel: (319) 292-6060
 Fax: (319) 292-5075
 Diesel engines

Deere Power Systems, John Deere Engine Division
 PB13 45401 Fleury les Aubrais
 Usine de Saran, France

Vessel:.....Unnamed
 Type:.....MK V SOC
 (Special operations craft)
 Builder:.....Peterson Builders Inc.
 Owner:.....U.S. Special
 Operations Command
 Main engines:.....MTU
 Thruster engines:.....MTU
 Thrusters:.....Hamilton Waterjet
 Gears:.....ZF
 Propellers:.....Rolla

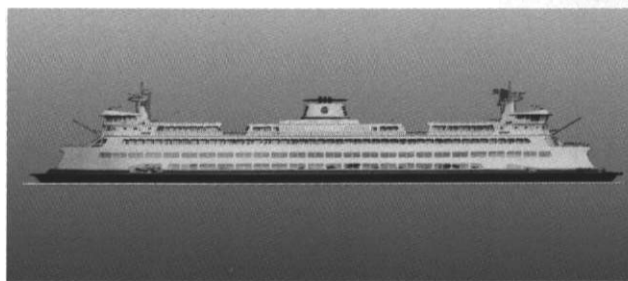


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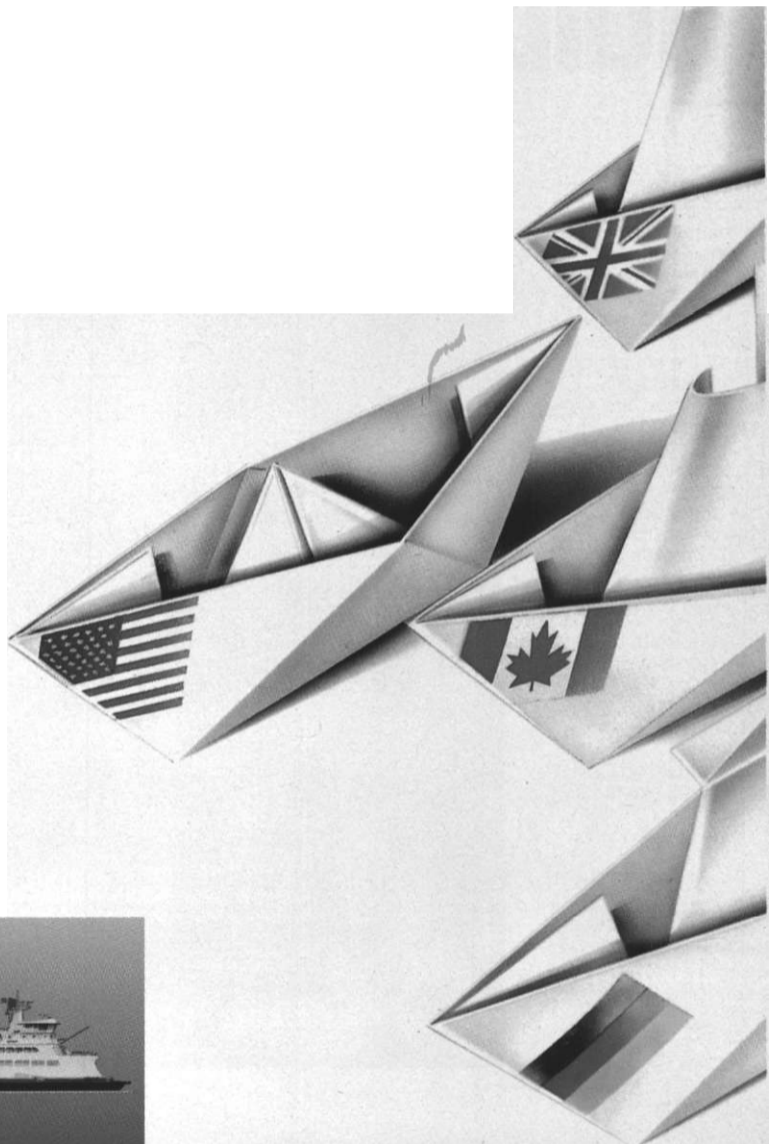
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Marine Propulsion Technology — Supplier Directory

Contact: Phil Parisien
Tel: +33 38826119
Fax: +33 38826000
Diesel engines

John Deere Intercontinental, GmbH
400 19th Street
Moline, 111.61265-1388 USA
Contact: Merlin Derr
Tel: (309) 765-3310
Fax: (309)765-3197
Diesel engines

Detroit Diesel Corp.
13400 Outer Drive West
Detroit, Mich. 48239-4001 USA
Contact: Nancy Martin
Tel: (313) 592-5000
Fax: (313) 592-7580
Diesel engines

Deutz Motoren-Werke Mannheim (MWM) AG
Carl-Benz Str. 5
D-68A40 Mannheim, Germany
Contact: Jens Eybacher
Tel: +49 621 384781

fax: +49 621 384211
Diesel engines, generating sets

Dieselmotorenwerk Rostock GmbH
Erich-Schlesinger-Strasse 50
0-2500 Rostock 6 Germany
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Fax: +37 81 22600
DMI Norshipco
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Tel: (904) 494-2963

Fax: (804) 494-4164
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Fax: (708) 387-5845
Diesel engines, reverse-reduction gears

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D-22761 Hamburg, Germany
Contact: LotharJahnke
Tel: +49 040 8504026 27
Fax: +49 040 8501070
Diesel engines/spares

GE Marine & Industrial Engines
One Neumann Way MD SI 58
Cincinnati, Ohio 45215-6301 USA
Contact: Robert Bass
Tel: (513) 552-5465
Fax: (513) 552-5001
Gas turbines

GEC Alsthom Paxman Diesels Ltd.
Hythe Hill
Colchester, Essex, CO1 2HW England
Contact: W.T. Van Orden
Tel: +44 206 79 5151
Fax: +44 206 79 7869
Diesel engines

GEC Alsthom Paxman Diesels Ltd. (in the U.S.)
c/o EGT Inc.
15950 Park Road
Houston, Texas 77084 USA
Contact: S.G. Morrow
Tel: (713) 578-7828
Fax: (713) 892 8277
Diesel engines

GEC Alsthom Ruston Diesels Ltd.
Vulcan Works, Newton-de-Willows
Merseyside, England WA1Z 8RD
Contact: C. Foulkes, sales director
Tel: +44 (925) 225151
Fax: +44 (925) 222055
Diesel engines

General Electric Transportation Systems
2901 East Lake Road
Erie, Pa. 16513 USA
Contact: John A. Molitoriss
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Fax: (814) 875-5591
Diesel engines

Giro Engineering Ltd.
Talisman, Duncan Road, Park Gate
Southampton, Hants, 5031 7GA England
Contact: C.R. Galley
Tel: +44 (0)489 8852 88
Fax: +44(0)489 885199
Diesel engines

HamiltonJet
PO Box 709 LunnsRoad
Middleton Christchurch
4 New Zealand
Contact: Jeff Reid
Tel: +64 (3) 348 4179
Fax: +64 (3) 348 6969
Waterjets

Hatch & Kirk
5111 LearyAve. NW
Seattle, Washington 98107 USA
Contact: Chris Mainz
Tel: (206) 783-2766
Fax: (206) 782-6482

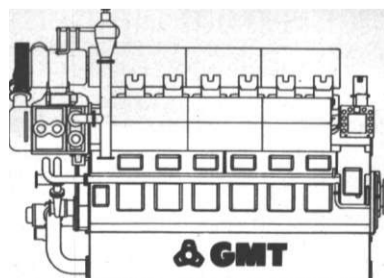
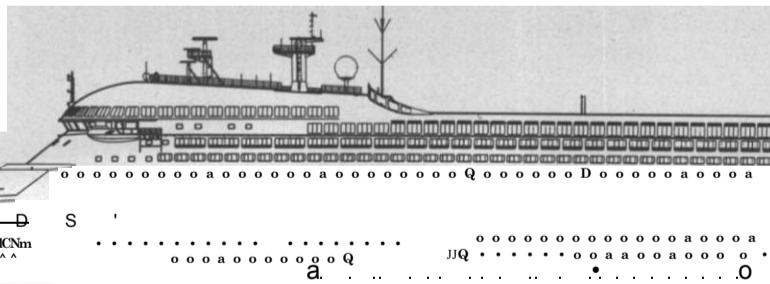
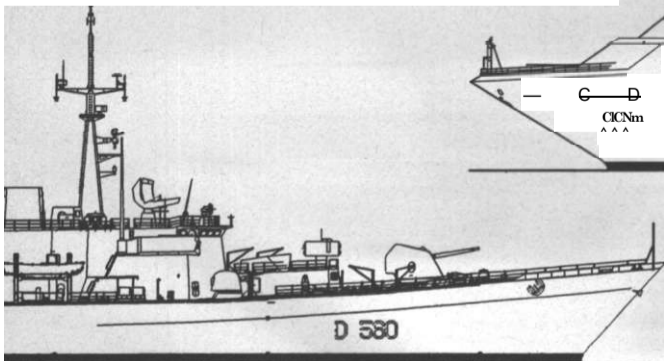
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Circle 236 on Reader Service Card

Maritime Reporter/Engineering News

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Marine Propulsion Technology — Supplier Directory



The *Emeraude*, delivered by Leroux & Lotz of Nantes, France to owner Emeraude Lines, is the first of the Corsaire 6000 series of fast ferries. Made of aluminum alloy, these ferries are adapted to operation in rough seas thanks to the deep-V monohull concept. Propulsion is provided by three waterjets, two of which are lateral, and the other one central and non-steerable, used as a booster. Backed by the fast ferry's Deutz MWM main engine, the package gives the vessel a speed of 34 knots at 100 percent engine power. The lateral waterjets are each driven by an MWM 604

BV 16 engine of 3,050 mhp maximum power and without the central jet can drive the vessel to a speed of 22 knots.

Vessel:.....*Emeraude*
 Type:.....Fast Ferry
 Builder:.....Leroux & Lotz
 Owner:.....Emeraude Lines
 Engines:.....Deutz MWM
 Waterjets:.....KaMeWa
 Bow thruster:.....Jimecal

Fax: (504) 393-5006
 Thrusters, propellers, waterjets

Innovation Marine Corp.
 2331 -13 Whitfield Industrial Way
 Sarasota, Fla. 34243 USA
 Contact: Robert Hillman, Rick Lamore Jr.
 Tel: (813) 756-4337
 Fax: (813)751-5398
 Seatek diesel engines, gas engines

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Karl Senner, Inc.
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 Kenner, La. 70062 USA
 Contact: Michael K. Senner
 Tel: (504) 469-4000
 Fax: (504) 464-7528
 Propellers, gears

Kawasaki Heavy Industries
 World Trade Center Building
 4-1, Hamamatsu-Cho, 2-Chome, Minato-Ku
 Tokyo 105 Japan
 Contact: Marine Machinery Sales Dept., Prime Mover Div.
 Tel: +81 3 3435 2374
 Fax: +81 3 3435 2022
 Diesel engines, gas turbines, thrusters, propellers, waterjets, gears, rudders, steering gear, marine boilers

KHD Canada Inc.
 4420 Garand Street
 St. Laurent, Quebec, Canada
 Tel: (514) 335-3150
 Fax: (514) 332-4173
 Diesel engines

Krupp MaK Maschinenbau GmbH
 Falckensteiner Str. 2
 24159 Kiel, Germany
 Contact: J. Homeyer, Dept. CM30
 Tel: +49 4313995 587
 Fax: +49 431 3995 588
 Diesel engines

Lips BV
 Lipstraat 52 PO Box 6
 5151 RP Deunen The Netherlands
 Contact: Anne Geerts
 Tel: +31 4163 88115
 Fax: +31 4163 73162
 Thrusters, propellers, waterjets, control systems

Lohmann & Stolterfoht
 Postfach 1860
 D-5810 Witten Germany
 Tel: +49 (02302) 8 77-0
 Fax: +49 (02302) 87 74 00

L'Orange GmbH
 PO Box 40 05 40
 Stuttgart 40
 D-7000 Germany
 Tel: +49 (0) 7 11 82609
 Fax: +49 (0) 7 11 82609 61
 Fuel injection systems

Lo-Rez Vibration Control Ltd.
 186 West 8th Avenue
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 CH-8023 Zurich
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 VP, Sales and Contracts
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 Fax:+41 01/278 78 80
 Gears

MAN B&W Diesel AS, Alpha Diesel
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Speed at full load: 34 knots

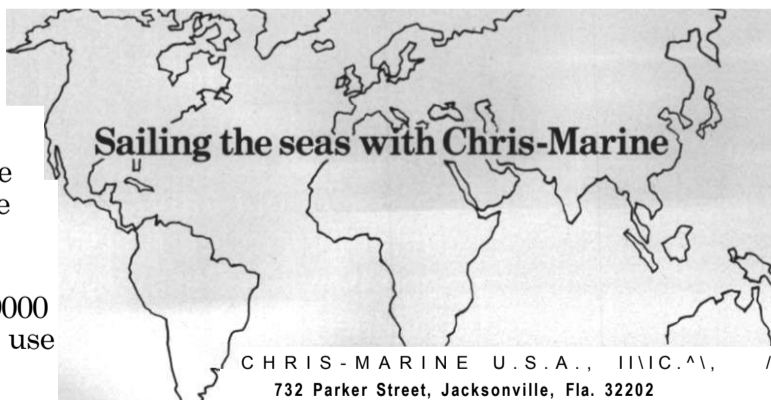
Constructed by Leroux et Lotz Naval, operated by Emeraude Lines.



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KAMEWA AB. P.O. BOX 1010, S-681 29 KRISTINEHAMN, SWEDEN
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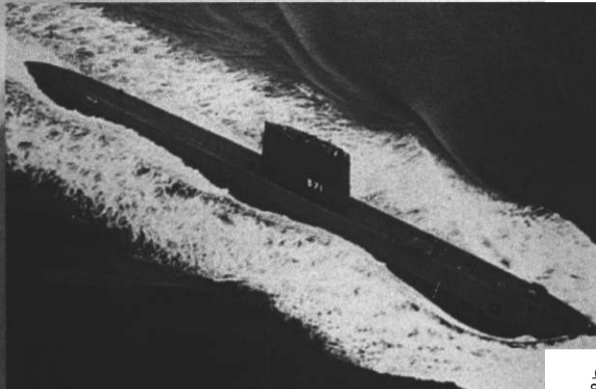


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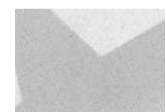
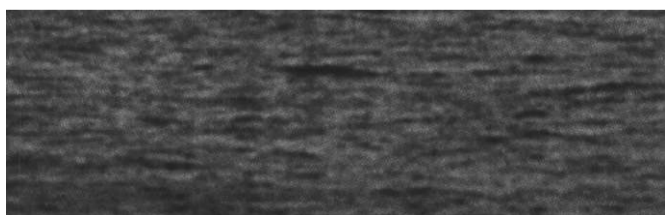
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Contact: Claus Windelev, president, Les Gingell, director

Tel: (212) 269-0980
Fax: (212) 363-2469
Diesel engines, propellers, gears, Holeby generator sets, Alpha propulsion systems

MAN B&W Diesel GmbH
Presse-und Informationsstelle
Postfach 10 00 80
8900 Augsburg 1
Tel: +49 (0821)322-1
Fax: +49 (0821)322-3382

Marine Propulsion Inc.
1505 Corbin Avenue
Hammond, La. 70403 USA
Contact: Ken Robbins or Rick Stinson
Tel: (504) 542-5344
Fax: (504) 542-5347

Propellers, waterjets, gears, torsional couplings and drivelines

Markisches Werke GmbH
PO Box 1442
Halver 1 D-5884 Germany
Tel: +49 2353 7227
Fax: +49 2353 72255

Meco-Marine Div., Woodex Bearing Co., Inc.
Bay Point Road, Box 37A
Georgetown, Me. 04548 USA
Contacts: David Bowers, "Starkey" Steuernagle
Tel: (207)371-2210
Fax: (207) 371-2169
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Chiyoda-ku, Tokyo, Japan
Contact: Tatsuo Tajima, acting gen. mgr., diesel planning
Tel: +81 3 3212 9080
Fax: +81 3 3212 9779
Diesel engines

Michigan Wheel Corporation

1501 Buchanan Ave SW
Grand Rapids, Mich. 49507 USA
Tel: (616)452-6941
Fax: (616) 247-0227
Propellers

MKW Power Systems
PO Box 1928 301 S. Church Street
Rocky Mount, N.C.27804 USA
Contact: Larry Crisafulli
Tel: (919) 977-2720
Fax: (919)446-3830
Diesel engines, generator sets

MTU North America
10450 Corporate Drive
Sugarland, Texas 77478 USA
Contact: John Shock, Gen. Sales Mgr.
Tel: (713) 240-4100
Fax: (713) 240 8032
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MWB Moterenwerk Bremerhaven GmbH
Kaiserhafen 1 D-2850
Bremerhaven Germany
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Fax: +49 (0471)488-394

Nelson Division
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Stoughton, Wis. 53589-0428 USA

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Fax: (608) 873-1532
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Jersey City, N.J. 07310
Tel: (201)217-9300
Fax: (201)217-1312
Diesel engines

North American Marine Jet
PO Box 1232 216 East Sevier Street
Benton, Ark. 72018 USA
Contact: Jason T. Hill
Tel: (501) 778-4151; Fax: (501)778-6381
Waterjets

Omnithruster Inc.
9515 Sorenson Ave.
Santa Fe Springs, Calif. USA
Contact: Monica Sandoval-Zazueta
Tel: (310) 802-1818
Fax: (310) 841-0309
Thrusters

Perkins Engines (Stafford) Ltd. (formerly Dorman Diesels Ltd.)
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ST1634B England
Tel: +44 0785 223141
Fax: +44 0785 215110
Diesel engines

Reintjes Schiffsgetriebe GmbH
Hunxer strasse 149, Postfach 10 04 20
W-4220 Dinslaken Germany
Tel: +49 (05151) 1 04-0
Fax: +49(05151) 1 04-3 00

Renk Tacke GmbH
Gogginger Str. 73, D-86159
Augsburg Germany
Contact: Mr. K. H. Merk
gen. mgr., marine gear div.
Tel: +49 (821) 57 00-0
Fax: +49 (821)57 00-460
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Renk Tacke GmbH
Rodder Damm 170 D-48432
Rheine Germany
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Fax: +49 (5971)790-208
Gears, clutches, couplings, bearings

Rolla SP Propellers USA, Inc.
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Melbourne, Fla. 32934 USA
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Fax: (407) 242-7771
Propellers

Schelde Gears
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The Netherlands
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Fax: +31 1184 82686

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Hammond, La. 70403 USA
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Thrusters, waterjets, Z-drives, torsional couplings and drivelines

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Mainzer Strasse 99
D-56322 Spay/Rhein, Germany
Contact: Dipl. Ing. Uwe Gragen, director of marketing & sales
Tel: +49 26 28 6 10
Fax: +49 26 28 6 13 00
Thusters, waterjets

SEMT Pielstick
2 Quai de Seine
93203 Saint-Denis, France
Contact: Y. LeDisez, sales promotion manager
Tel: + 33 48097600
Fax: + 33 48097759
Diesel engines

Skinner Power Div.
337 W. 12th Street
Erie, Pa. 16501 USA
Contact: John Feuell
Tel: (814) 459-0570
Fax: (814)452-6259
Steam turbines, steam turbine generator sets

SKL Motoren-und-Systemtechnik GmbH
- vorm. Buckau-Worlf -
Alt Salbke 6-10, 39122 Magdeburg Germany
Contact: SKL Engine Sales
Tel: +49 (03 91)432 2130
Fax: +49 (03 91)432 4015
Diesel engines

Skoda Concern Plzen CR
c/o Tripes Materials, U.S. agent
1173 B Persimmon Ave.
El Cajon, Calif. 92021 USA
Contact: George Tripes
Tel/fax: (619) 442-7005
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Fax: (302) 322-8548
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Tel: (504) 347-4326
Fax: (504) 348-8970
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Houston, Texas 77041 USA
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Marine Propulsion Technology

(Continued from page 63)

several important installations in the past, will provide the larger rotating machinery for the large Costa Cruises ship placed recently with the Vulkan Group. This will have six MAN B&W 58/64 engines, three with six and three with seven cylinders

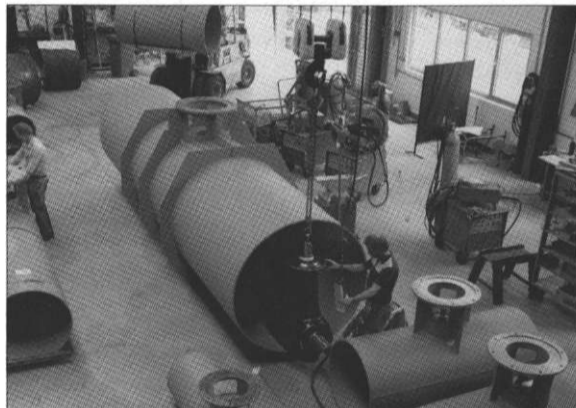
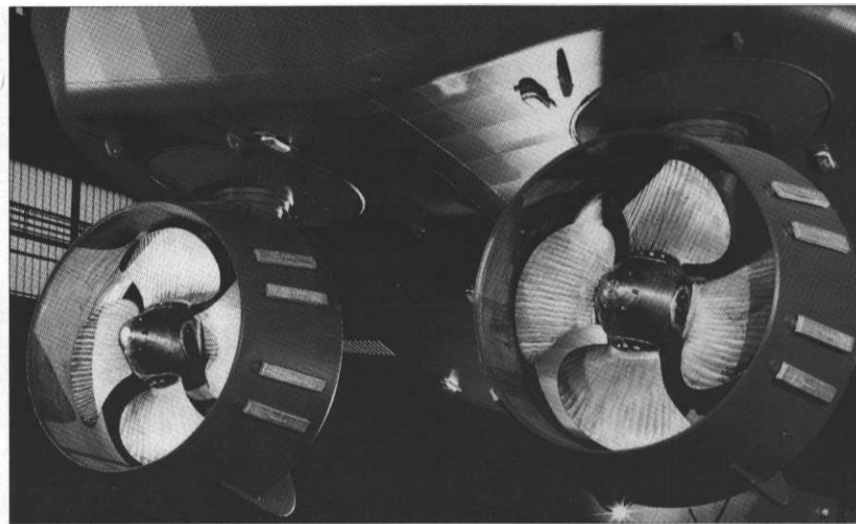
and two 15 MW AEG propulsion motors. Provision for abating exhaust emissions will be incorporated. Electric transmission has also been revived as a medium for powering tankers, specifically those which have a need for power in addition to propulsion. Auxiliary generators are unnecessary since energy can be obtained from the main machinery via an extension of the switchboard. It is well-suited to product carriers having a multiplicity of

cargo tanks, each with its own motor-driven deepwell pump and segregated discharge system. An order for seven 37,000-dwt Stolt-Nielsen product tankers for delivery from late 1995 to late 1997 was placed during the year with Danyards. They are to have generators, control gear and motors supplied by Cegelec (GEC Alsthom).

Shuttle tankers serving offshore oil production sources are ideal applications as, while approaching a

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Newport News Pursues The Electric Drive

Newport News Shipbuilding (NNS), with its partner Kaman Electromagnetics Corporation, has developed and patented an Integrated Power System (IPS), an electric drive system technology NNS says offers multiple benefits for both commercial and military ships.

Among those touted benefits are significantly less total system weight and volume; flexible arrangement options; module commonality among ship classes; reduced spare requirements; improved construction efficiencies; standard machinery controls; zonal electrical distribution for ship services; heater machinery component reliability; simplified logistics support; and increased compliance with the environmental requirements for reduced emissions. All of this, according to NNS, leads to reduced acquisition and life-cycle costs.

The Navy estimates a 40,000-hp electric drive propulsion package is less than one-third the volume of the diesel equivalent. That greater flexibility of arrangement options is enhanced by the fact that the prime mover need not be directly attached to the propulsion shaft. The Navy also says the 40,000-hp electric drive is less than one quarter the weight of a diesel with the same power.

According to NNS, engineering case studies comparing IPS to other propulsion systems estimate anywhere from \$2 million (for an LNG carrier) to \$29 million (for a military vessel) in acquisition cost savings from the new technology, and between \$1 million and \$4 million annually in life-cycle costs.

The System

NNS's Integrated Power System is configured as follows: compact permanent magnet generators produce high-frequency AC power that is converted to DC power by modular rectifiers located at the generator. That DC power is then distributed by bus duct to the propulsion motor inverters located on the motors. DC power is also distributed to the ships service system by two bus ducts that run the length of the ship. Vital ships service loads are powered from both buses through electronic transfer devices. Inverters located at the load convert the DC power to whatever type and quality AC power is required. The rectifier and inverters also provide circuit protection, eliminating the need for mechanical circuit breakers at their locations.

When used to supply dedicated loads, the inverters incorporate the functions of variable speed motor controllers and circuit breakers, thereby eliminating these components.

One prime mover develops power for both ships service and ship pro-

pulsion, using the same basic control and distribution system, reducing the number of prime power sources on a ship.

Making the pursuit of this technology feasible were certain recent advances in solid-state electronics and permanent magnet technology. NNS says that by developing high-performance electrical hardware — high-power density motors, generators, inverters, rectifiers, controls and distribution systems — they are making the theoretical technology real. NNS has renamed these sets of hardware, now calling them *power generation modules*, *propulsion motor modules* and *electric power transmission distribution conversion modules*. The modules are common across ship classes; specific ship service requirements are met by installing a varying number of given function modules — eliminating the need for separate ships service generators and auxiliary systems.

Permanent Magnet Generator

Under contract to the U.S. Navy, the NNS/KEC team is developing an IPS permanent magnet generator which will be directly shafted to the prime mover using high-strength permanent magnets and high rotation speed. The generator is configured as a radial cup with the rotor outside the stator, and with the permanent magnets attached to the inside of the cup. Propulsion-derived ships service power is obtained from the common high frequency generator that also supplies electric drive propulsion.

Direct Current Zonal Power Distribution

DC power distribution became feasible with the development of the Insulated Gate Bipolar Transistor (IGBT), which can switch high levels of power at high speed, permitting the use of pulse-width modulation to invert DC power to the type of high-quality AC power desired. The same inverter module can produce whatever type of power output is required, simply by changing the software.

Propulsion Motor

The electric propulsion motor is an axial gap, permanent magnet design that employs pulse-width modulated inverters to control the wave shape of the stator current. Both the generator and the propulsion motor use the same permanent magnet material — neodymium-iron-boron.

The Time Frame

Tests have been conducted on 20, 100-, and 700-hp prototypes. A3,000-

hp scaled prototype of a 25,000-hp motor is scheduled for testing this year. The final phase of the development project will be to build and test the full-scale motor.

NNS says that its current proto-

type development of the IPS system will allow full-scale installation in both military and commercial surface ships by 1998.

For more information on NNS
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PROPULSION UPDATE



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Maritime Reporter/Engineering News

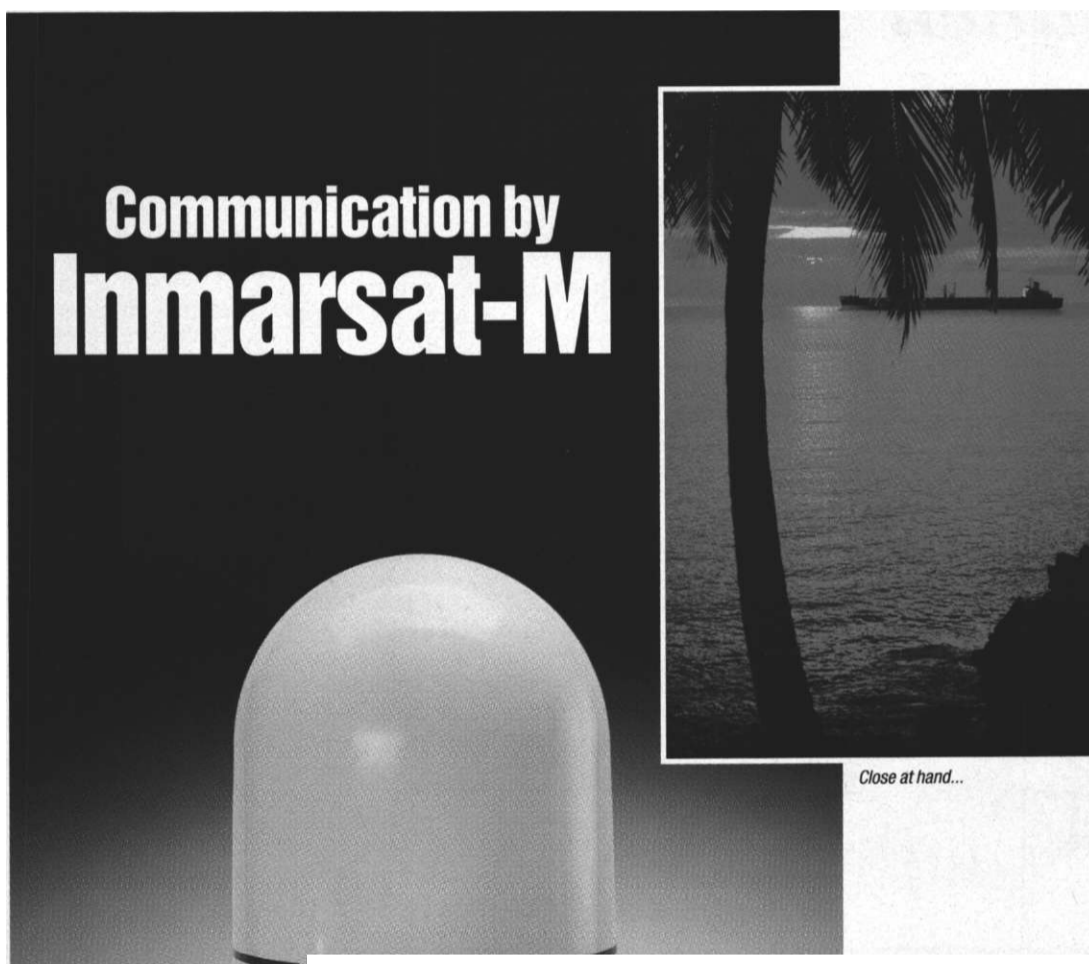
Marine Propulsion Technology

loading buoy and throughout the time they are connected by hose, they must have reserves of power immediately available for the screw(s) and thrusters in order to keep station. To date all those on order in Spain and the Far East are North Sea operations and will have electrical plant by ABB Marine Drives of Finland. A topical applica-

tion of electric drive is seen in the current uprating of three nine-year-old Sea-Land containerships by Blohm + Voss, in Hamburg. They are required to operate on a new trans-Atlantic service, but in their original state — as former USL econoships — they were too large and much too slow. They have been "cut and shut" by removing a section

of three x 40-ft. cells from the parallel body amidships, reducing the capacity from 3,900 to 3,000 TEU. A new and much finer forebody with a bowthruster was fitted, and the power on the shaft was increased by some 4,000 kW, the net effect being to raise the speed from 18 to 21 knots. The machinery uprating was a major physical problem as the engine room, containing a 20,500-kW 7RLB90 Sulzer engine, and set as far aft as possible, was very short

and offered no space for a source of additional power. The solution adopted was to install a 4,860-kW 6.6 kV generator, driven by a 12-cylinder Wartsila Vasa 32E engine, together with auxiliaries and switchboard at upper deck level within the port side casing which supports the superstructure. There was no possibility of using a shaft-riding motor, as was the case with MOL ships three years ago, but a Lohmann & Stolterfoht vertically-stepped "tunnel gear" was shoe-horned into the narrow space immediately aft of the engine, with the 4,000-kW, 1,200 rpm driving motor above. The fixed propeller was changed for a KaMeWa cp one, enabling the plant to be run at a constant 102 rpm, with ship speed adjusted by changing the propeller pitch. The switch and control gear was thus greatly simplified. The generator was able to supply the 1,800 kW KaMeWa bowthruster, as the motor would not be required when maneuvering. ABB Marine Drives were responsible for this booster drive.



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Stsuiit

Steam's last grasp of the marine propulsion market lies in the LNG tanker for which, except for one ship with a Sulzer crosshead engine and one with a General Electric (GE) heavy duty gas turbine, built some 20 years ago and no longer in service, it has been adopted exclusively. In spite of very heavy investment in full-scale R&D by the leading diesel engine manufacturers of both slow-running and medium-speed engines, no ships have been ordered with internal combustion machinery; the long-term economics of operating these very costly ships having shown no advantage.

They can burn the inevitable and continuous boil-off of the cargo under the boilers at sea and also in harbor when means might otherwise have made for disposal as burn-off ashore. Excess steam generated in harbor is passed to a dump condenser. What is perhaps surprising is that steam turbines of only 12,500 shp were specified for a small distributive LNG tanker, built by NKK for operation on the Malaysian coast; another has been ordered in recent months.

Although a dozen large LNG tankers are on order in European yards and there are several concerns in Europe which have an illustrious past reputation for building steam turbines, none until a few weeks ago has shown any interest in reviving this activity. This, in spite of a forecast demand for a considerable volume of LNG newbuildings. Hitherto, all the turbines have been placed with Japanese engine builders Kawasaki and Mitsubishi, a duopoly broken recently by a contract for an LNG carrier and steam turbine machinery placed in Italy by the state natural gas enterprise Snam. The turbines and gears will be built to a GE design by the CNR Riva Trigoso engine works of Fincantieri, hitherto engaged in the construction of machinery for CODOG frigates and destroyers.

PROPULSION UPDATE

GE LM2500+: Packing A More Powerful Punch

Market demand for more powerful machines led GE Marine & Industrial Engines' (M&IE) to expand its aeroderivative product line, resulting in the recent introduction of the LM2500+ gas turbine.

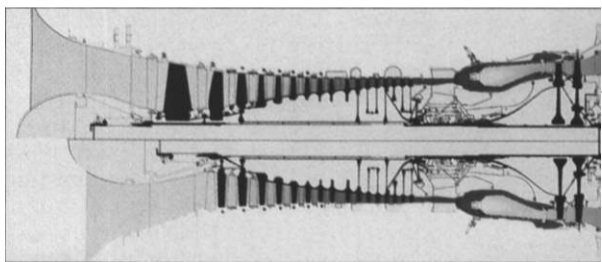
With a design based on the popular LM2500, the new LM2500+ is designed to provide lower installed and life-cycle costs than its predecessor, while providing up to a 25 percent increase in power output. Combined with minimal changes to the gas turbine package design, the LM2500+ will also provide a reduction in the dollars-per-kilowatt.

The LM2500+ will be initially offered at 37,000 shaft horse power (shp) and 27.6 MW, with a simple

cycle thermal efficiency of more than 37 percent. It is expected that the engine will achieve standards for reliability in excess of 99.6 percent, and availability above 96.5 percent. Once enough experience has been accumulated on the new gas turbine to ensure it maintains high reliability standards, it will be uprated to its design rating of 39,000 shp, 29 MW and a thermal efficiency of 38 percent. Shipment of the first production engine is scheduled for the first quarter of 1996.

Marketing The LM2500+

The two-shaft LM2500+ is aimed



at the industrial and commercial marine markets for various power generation applications in the 50- and 60-Hz markets, pipeline compression and mechanical drive, and fast ferry commercial marine use. Emissions controls available from introduction of the LM2500+ will include water or steam injection using a standard combustor or the LM2500 Dry Low Emissions (DLE) combustion system.

Performance By Design

The new LM2500+ incorporates several enhanced design elements, including:

- **Compressor Rotor:** The current LM2500 has a 16-stage compressor. The LM2500+ will have a 0-stage added to increase compressor airflow by approximately 20 percent. This wide chord bladed disk forward of stage 1 will be based on aircraft engine technology. M&IE's re-design of stage 1 blades CF6-80C2 to wide chord configuration will eliminate the mid-span dampers. A CF6-80C2/LM6000 rotor airfoil design will also be added to stages 2 and 3. CF6-80C2/LM6000 stages will be incorporated into the compressor to improve compressor efficiency. Additional changes to the compressor include a new inlet guide vane assembly.

- **High Pressure Turbine Rotor & Stator:** These components will be redesigned to reduce maintenance costs, and will include new materials for improved oxidation life. Stage

1 and 2 contours will be optimized for higher flows.

- **Power Turbine:** Aerodynamically coupled with and driven by the exhaust gas from the gas generator, the LM2500+ power turbine will be redesigned for the higher power output. The Stage 1 and 6 blades are optimized for aerodynamic efficiency. The power turbine rotor has been strengthened for the higher torque and potential energy of the LM2500+.

The changes make the LM2500+ 13.5 in. (34.3 cm) longer than the 21.4-ft. (6.52-m) LM2500. The weight, in any configuration, is not expected to increase more than 800 lbs.

Operating on natural gas at the design point rating, the LM2500+'s expected hot section repair and overhaul intervals are 25,000 and 50,000 hours, respectively.

M&IE has produced more than 1,300 LM2500 marine and industrial gas turbines to date.

For more information on GE
Circle 11 on Reader Service Card

Canadian Government Gives Go-Ahead To Raise Sunken Barge

The Canadian federal government has reportedly decided to proceed with a proposal to lift the sunken barge *Irving Whale*, transport it to Mulgrave, Nova Scotia, recover its cargo of Bunker C oil, clean the barge then sell it or dispose of it. The decision reportedly came after consultations with individuals and groups throughout the Gulf of St. Lawrence area.

Raising the sunken barge had evidently caused concern on the environmental safety front, and the government was weighing the technical merits of lifting and moving the barge and its oil versus pumping it out in place.

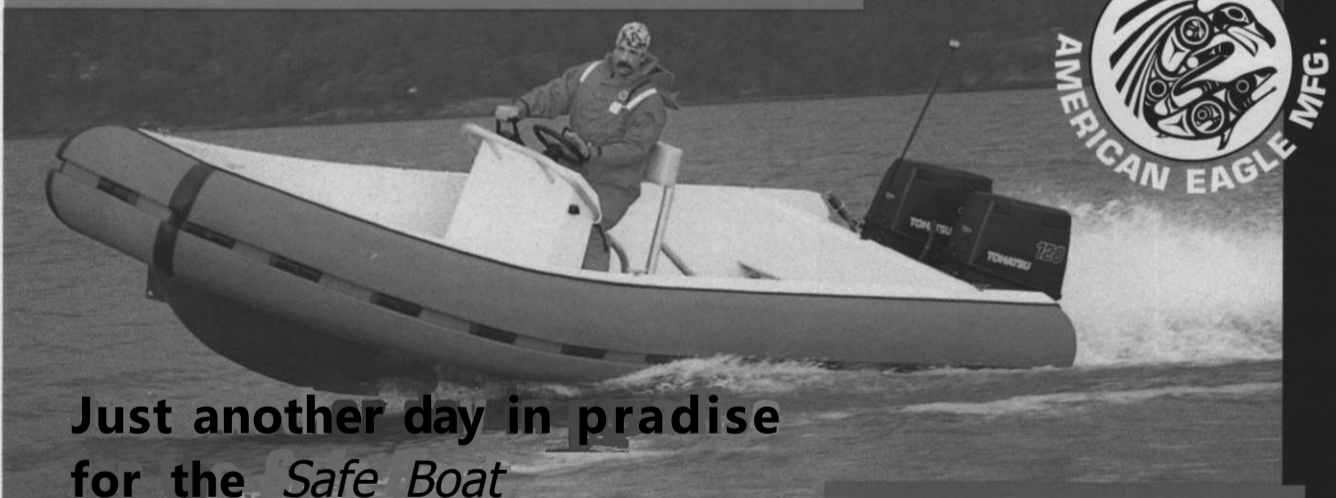
Other factors included the condition of the vessel and its ability to withstand a lifting operation; the costs of the various plans; and contingency planning.

The tendering process for a contractor to recover the *Irving Whale* is expected to begin shortly; the recovery operation is scheduled for the summer of 1995.

It was determined that the "lift and empty" method was favorable over pumping out in-place, as the latter would have left an estimated 230 to 300 tons of oil in the vessel, which most likely would eventually enter the surrounding marine environment.

Although the possibility of oil leakage is reportedly considered minimal, the contractor selected for the job will be required to develop and submit a detailed contingency plan to deal with all eventualities. The contingency plan will then be reviewed by the DOT and DOE.

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Apache Corp. High Bidder In 12 Offshore Gulf Leases

Apache Corp. was the apparent high bidder on nine of 12 offshore lease blocks which the company bid for during the OCS 150 Western Gulf of Mexico Lease Sale in New Orleans.

Apache and bidding partners offered total gross bids of \$2.4 million on the nine blocks, of which \$1.8 million is net to Apache. The company operates 102 of the 188 Gulf lease blocks in which the company has interests.

Following is a list of the blocks and respective working interests for Apache and its partners. All bids are subject to approval by the Minerals Management Service.

Galveston 300	Apache 100%
Galveston 316	Apache 100%
North Padre Island 913	Apache 100%
High Island 141	Apache 50%(operator), Hardy Oil & Gas 50%
High Island A-257	Apache 50%(operator), Tana Oil & Gas 50%
High Island A-258	Apache 50%(operator), Tana Oil & Gas 50%
High Island A-259	Apache 50%(operator), Tana Oil & Gas 50%
High Island A-260	Apache 50%(operator), Tana Oil & Gas 50%
High Island A-261	Apache 50%(operator), Tana Oil & Gas 50%

New DOT Award To Recognize Transportation-Improvement Tech

Innovative persons or companies who develop advanced technologies that make transportation safer or more efficient will be singled out for recognition by the U.S. Department of Transportation (DOT) with a new award.

The Award for Excellence in Transportation Technology Research and Development, to be presented annually, will recognize persons or organizations that have made outstanding advances in research and development resulting in significant improvements in safety, energy efficiency, environmental quality, or the nation's competitiveness in the world.

Secretary of Transportation **Federico Pefia** said, "We want to promote the development and application of new technologies that reduce accidents, save energy, create jobs and make this country a stronger competitor in the world." In a notice published in the *Federal Register*, the DOT asks for nominations by Oct. 30, 1994. The first award will be presented in early 1995.

Consolidated Natural Gas High Bidder In Two Gulf Leases

Consolidated Natural Gas Company's subsidiary, CNG Producing Company, was the high bidder on two tracts at the federal Gulf of Mexico lease sale held in New Orleans. The company's bids totaled \$334,080 for 100 percent working interest in High Island Block A-312 and 50 percent working interest in Brazos Block 490.

The bids will be reviewed by the Minerals Management Service of the U.S. Interior Department before leases are awarded. If approved, Consolidated will add approximately

8,600 net acres to the approximately 426,000 net acres it already holds in the Gulf.

Consolidated is one of the nation's largest producers, transporters and distributors of natural gas. The company has investments in six independent power plants; operates the nation's largest underground storage system for natural gas; and explores for and produces natural gas and oil throughout the U.S. and Canada.

OPRC Convention To Enter Into Force In 1995

A treaty designed to help governments combat major oil pollution will enter into force and will become international law on May 13, 1995, the IMO announced. The treaty is the International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC), adopted in November 1990 by a conference convened by the IMO. To enter into force, the convention had to be accepted by 15 states. This total was achieved on May 13, when Mexico's accession was deposited with the secretary-general of the IMO. The main features of the Convention include: International Cooperation and Mutual Assistance; Pollution Reporting; Oil Pollution Emergency Plans; National and Regional Preparedness and Response Capability; Technical Cooperation and Technology Transfer; Research and Development; and Institutional Arrangements and Support.

Offshore Pipelines Board Approves McDermott Merger

The board of directors of Offshore Pipelines, Inc. (OPI) has approved the previously-an-

nounced plan to combine its worldwide marine construction business with those of McDermott International, Inc. Completion of the transaction is subject to approval by the OPI stockholders and certain regulatory bodies. If all approvals are obtained on a timely basis, the transaction is expected to be completed by the end of 1994.

OPI is engaged in marine construction including fabricating and installing offshore platforms, laying marine pipelines, and salvaging, refurbishing and installing recycled offshore structures. McDermott International and its subsidiaries manufacture steam-generating equipment, environmental equipment, and products for the U.S. government and also provide engineering and construction services for the offshore oil and gas, utility and hydrocarbon processing industries.

American Oilfield Divers Unit Acquires IDS Assets For \$3 Million

American Oilfield Divers, Inc.'s subsidiary, American Pacific Marine, Inc., has acquired certain assets of IDS, and offshore/inland diving and engineering company in Oxnard, Calif. The purchase price was approximately \$3 million.

Assets acquired include a broad inventory of diving, fabrication and marine construction equipment, including three construction and diving support vessels: the M/V *George*, the M/V *Polar Constructor*, and the M/V *Coronado*.


IDS provides a wide range of services on the U.S. West Coast, including commercial diving, marine construction, fabrication, inspection and engineering services to companies operating in the marine construction and offshore oil and gas industries and select inland customers.

For more information on American Oilfield Divers
Circle 130 on Reader Service Card

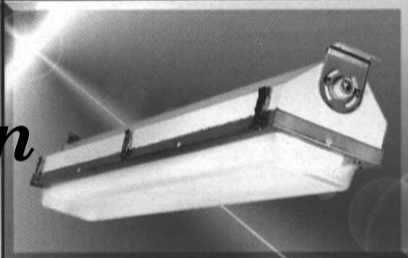
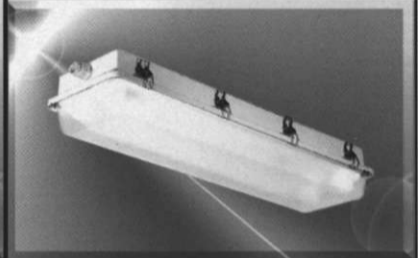
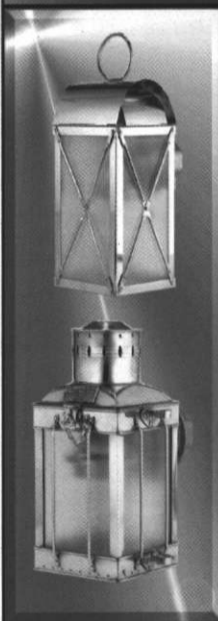




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Clipper III:

A Case Study In Monitoring Systems

The *Clipper III*, at 114 ft. (35 m) long and 88-gt, is the smallest of the three Clipper ships — high-speed passenger catamarans — owned by Clipper Navigation, Inc. of Seattle. The main route of the vessels is between Seattle and Victoria, British Columbia — a trip which, at a speed of 25 to 34 knots, they complete in about 2.5 hours.

Clipper III is powered by two 1,600-hp 16V 149 TI Detroit Diesels. The other two ships, the *Clipper* and *Clipper IV*, are considerably larger at 127 ft. and 427-gt and 132 ft. and 478-gt, respectively and each powered by dual MTU engines. Each of the three ships is propelled by a KaMeWa waterjet system. The *Clipper* and *Clipper IV* are supplied with monitoring systems which adequately assess the ship's condition, providing alarms. The *Clipper III* reportedly had a much simpler system that provided less information, so the company invested in a monitoring system built by Ernasko of

Lynnwood, Wash.

The System

The system operates through an IBM or compatible 486 computer. Ernasko supplied all of the sensors (pressure, temperature, flow, etc.), cabling, fittings, and junction boxes, as well as the sensor/computer interface and software. There are a total of 63 sensors on port and starboard main engines and generators: 42 temperature sensors (one on each of 16 exhaust ports on each main engine, one each monitoring fresh water intake, engine and generator oil, and reduction gear oil); and 14 pressure sensors (for each engine, generator oil, cooling water jackets, raw water, reduction gear oil, bearing, and reverse/steering); fuel flow sensors (to measure the consumption and temperature of the diesel fuel); and rpm sensors.

The full color display shows each of the functions in digital and graphic form, displaying engine lube oil pres-



The Victoria Clipper III, recently fitted with an Ernasko monitoring system.

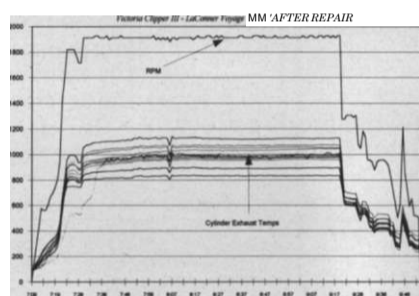
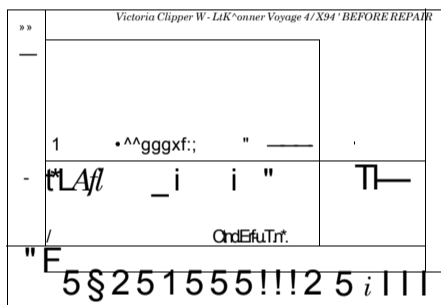
sure and temperature, and the temperature of each cylinder exhaust. The system can be operated using only a track ball, but also has an instruction line. Using the track ball, the user may change alarms, view a line graph (amplitude vs. time) of any function, save trip data to a disk, view any function since the beginning of the trip via line graph (amplitude vs. time), or quit.

The system's logging function allows the user to study vessel operation and find potential problems. The saved file can be imported into spreadsheet software and plotted to provide line graphs for all monitored functions. In the case of the *Clipper III*, the engineers knew that the ship's performance was not as good as it should have been, but hadn't yet concluded there was an engine problem. Viewing the graphs at the end of the trip showed one of the cylinders was operating erratically and at a much lower temperature than the others. Paul Brodeur, ship's superintendent, said that increased monitoring allows the establishment better preventive maintenance schedules and may prevent engine damage that could occur without this information. Some of the collected data has

shown that there may be large savings in fuel with small changes in engine rpm. According to Ernasko, a three percent decrease in rpm can amount to a 13 percent savings in fuel. Because of the success of the system on the port engine of the *Clipper III*, one was reportedly fitted to the starboard engine as well. In this case, the software would allow the user to alternate between engine displays, indicating "S" or "P." And screens can be designed to suit customer needs. Peter Thordarson of Ernasko says a new screen can be designed in less than a half-hour if the company knows what the customer wants.

Another feature, according to Ernasko, is that a sensor's electrical output is a pulsed frequency which is proportional to the measured level. Since the system's computer board is designed to recognize this type of signal, it ignores all other electrical interference on the ship. Existing ship sensors can be made to operate with the system through the use of a converter. This allows updating of manually operated systems to fully automatic at reportedly reduced costs.

For more information on Ernasko
Circle 106 on Reader Service Card



These graphs were generated before (left) and after (right) repairs were made to the Victoria *Clipper III*—repairs made possible because Ernasko's monitoring system alerted the crew to the problem. Note that in the graph on the left, exhaust gas temperature is more erratic.

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Circle 346 on Reader Service Card

ASRY Repair Revenue Up 10 Percent In First Half Of '94

Despite difficult trading conditions, Arab Shipbuilding and Repair Yard (ASRY) achieved an increase in shiprepair revenue of 10 percent in the first half of 1994. The increased revenue comes from the same number of vessels as were docked in 1993, suggesting that owners are slowly increasing the extent of repairs carried out in anticipation of rising freight rates in 1994.

ASRY added two graving docks in 1992 which are able to accommodate vessels of 120,000 and 80,000 dwt, complementing ASRY's 500,000 dwt graving dock — and is hoping to use that increased capacity when freight rates recover.

An increase in demand for steel renewals and internal tank coating has been noted and steel tonnage installed already exceeds that for the whole of 1993. A major internal tank coating job was completed earlier this year for a Papchristidis



ULCC, the 315,700-dwt *Hellespont Paradise*. This entailed treating two ballast tanks with fresh water wash, which was followed by grit blasting using 32 blasting nozzles in each 12 hour shift. Coatings used were a water-based inorganic zinc followed by Jotun's Penguin primer and then their coal tar epoxy 82. In August ASRY began work on a chemical carrier, and then on a 47,000-dwt LPG carrier which was fully blasted and coated.

For more information on ASRY
Circle 136 on Reader Service Card

ERL Wins Patents; Offers Catalog

Electromechanical Research Laboratories (ERL) has been granted two U.S. patents recently: one for the FULL-VIEW Marine Sight Glass, and the other for its Liquid Level Sensor for Tank Barges. The sight glass' design reportedly allows for large, clear sealed view. Two wiper alarms with easily-changed cartridges utilizing commonly available "O" rings make wiper changes for different cargoes easier. Reportedly unique to the design is a separate deck welding flange to ease installation and prevent glass damage.

The liquid level sensor's stainless steel construction and simple rotary action reportedly allow it to function reliably in "clean" products as light as .55 specific gravity as well as most "dirty" products. The design locates the floats outboard of a low-friction teflon and stainless steel hinge point for positive sensor switch activation.

ERL also offers a free catalog of regulatory tank barge signage, reportedly covering every sign tank barge owners are required to have plus important safety related signs.

For more information on ERL
Circle 144 on Reader Service Card

ADI Begins Work On \$736 Million Minehunter Program

Australian Defence Industries (ADI) began construction on its approximately \$736 million minehunter program for the Royal Australian Navy (RAN). The first minehunter is scheduled to be delivered in 1998. Guests at the contract signing included Minister of Defence, Senator **Robert Ray**.

ADI announced at the on-site signing ceremony that the Newcastle Office of Leighton Contractors would manage the construction work at the site. ADI Managing Director **Ken Harris** said it was expected that Leighton would subcontract much of the \$11.7 million building contract to Hunter region firms.

The signing followed the Commonwealth government's announcement June 2 that ADI was its preferred tenderer to build six new minehunters for the RAN. Mr. **Harris** said that in anticipation of the contract, ADI had already awarded more than \$147 million worth of contracts, essentially for the advanced, highly complex systems required for minehunters, including one for GEC Marconi Australia of New South Wales for sonar and combat systems. Detailed ship design will commence this month. Once this work is underway, ADI says it will be in a position to place orders for outfitting materials.

For more information on ADI
Circle 131 on Reader Service Card

Germanischer Lloyd Encourages Early ISM Start

International classification society Germanischer Lloyd (GL) has begun certification of several owners, operators and their ships under the new International Safety Management (ISM) Code, four years before the new International Maritime Organization (IMO) code becomes mandatory.

GL believes that due to the number of ships in service worldwide, owners may find it difficult to obtain ISM certification by the due date if they do not begin the process soon. The ISM Code requires owner/operators to set up a safety management system which will be regularly inspected and certified. GL's certification scheme defines the procedure for the assessment of the safety management system covering the operation of

ships.

The ISM Code becomes mandatory for passenger and high speed ships and oil, chemical and gas tankers and bulk carriers from July 1, 1998; and for other cargo ships and mobile offshore drilling units of more than 500 gt by July 1, 2002. A brochure from Germanischer Lloyd entitled "Your Next Step In Safety" describes the certification of ship management systems in detail.

For more information on GL's brochure
Circle 134 on Reader Service Card

Noriss Warming Delivers System To Hibernia Project

Norris Warming Canada Ltd. (NWCL), which

specializes in Heating, Ventilation and Air-Conditioning (HVAC) for marine applications, has completed delivery of highly specialized air handling equipment to the Hibernia offshore project which included 16 large stainless steel air handling units custom designed with high efficiency air filters, titanium cooling coils, duty and standby distribution fans and associated control equipment. The equipment handles 1.5 million cubic ft. per hour of conditioned air, providing 10 million BTU/hr of cooling and over 3 MW of heating load.

Also delivered were over 600 high integrity fire, gas, volume control and balancing dampers. NWCL is vigorously soliciting the U.S. shipbuilding market, promoting its Single System Vendor (SSV) capability.

For more information on NWCL
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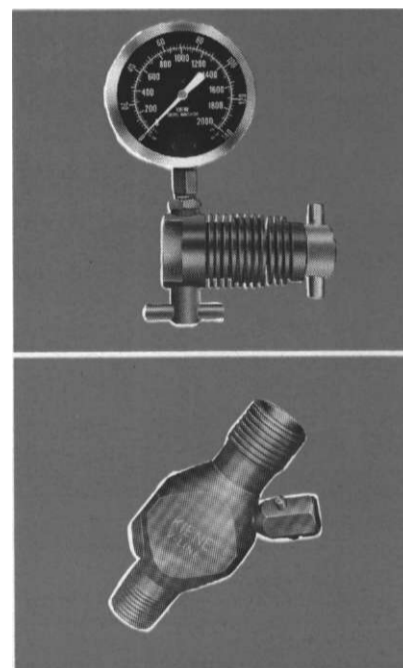
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Intermarine Delivers Second Osprey-Class Minehunter

Intermarine USA of Savannah, Ga. has delivered the second of eight ships of the Osprey class coastal minehunter, USS *Heron* (MHC 52), to the U.S. Navy. On Aug. 6, 1994 following a ceremony on the historic Savannah city river front, Lcdr. **Daniel I. Gallagher** placed the vessel in commission.

The ship will return to the Intermarine USA shipyard for post-delivery availability, then sail to the U.S. Naval base at Charleston, S.C. Following Navy trials, the ship will be homeported in Ingleside, Texas. The *Heron* and her sisterships are 188 ft. (57.3 m) long, 890 metric tons in weight, and are reportedly the world's largest ships to be constructed entirely of glass reinforced plastic (GRP).

Intermarine also christened and launched into the Savannah River the fourth Osprey-class minehunter, the *Black Hawk* (MHC 58), on August 27.

For more information on Intermarine
Circle 145 on Reader Service Card

New Management For RIB Maker

HBI Hard Bottom International Inc., a producer of rigid inflatable boats (RIBs) has come under new ownership. **Paul Wagner** has purchased the company and the company now has plans to market eight new high-performance RIBs from

11 to 40 ft. (3.3 to 12.1m).

Featuring a rugged, deep-V fiberglass hull, these new boats incorporate a proprietary luff groove extrusion for attaching and removing air tubes. Inside the hull, a unique grid system functions as an internal backbone and increases the strength factor of the boats. The strength of deep-V hulls combined with heavy duty Hypalon® tubes reportedly provides a powerful, soft-reporting RIB.

For more information on HBI
Circle 137 on Reader Service Card

Chiasson Named VP Of Repair At Service Marine

Ronnie Chiasson has been appointed vice president of repair at Service Marine Industries, Inc. Mr. **Chiasson** has over 19 years of experience in the marine industry in similar positions and most recently has served as general manager of Conrad Industries in Morgan City, La. for the past seven years.

Mr. **Chiasson's** duties include coordination and management of Service Marine's repair capabilities, which include three drydocks, up to 3,600 tons capacity, and a gas flaring plant for use on various types of inland and offshore barges.

Service Marine, with two facilities in Morgan City, is a full-service shipyard offering in-house design capabilities, new construction in offshore workboats, dinner cruise vessels and casino vessels, and a full range of shiprepair, overhaul and conversion capabilities.

For more information on
Service Marine
Circle 138 on Reader Service Card

Hike Metal Delivers Transport Barge To U.S. Parks Service

A new transport barge, designed and built by Hike Metal Products for the Bighorn Canyon National Recreation Area in Montana (U.S. National Parks Service), was constructed with a unique aluminum welding process to meet the demands of constant use along rocky canyonways.

Hike Metal's 32-ft. (9.7-m) aluminum barge provides multi-purpose transportation for passengers, equipment and vehicles along the nearly 40-mile-long canyon. The craft features a forward cargo deck and full-width, double hinged bow loading ramps to accommodate vehicles and equipment at various terrain levels. A side hinged dive platform provides easy access to the water.

Twin Mercruiser D-219 diesels with Bravo II outdrives push the boat at 30 mph with a 6,200-lb. payload. Total cargo capacity is 10,000 lbs.

Hike Metal Products has been producing a wide range of aluminum and steel boats up to 150 ft. (45.7 m) since 1963.

For more information on Hike Metal
Circle 139 on Reader Service Card

Bender Launches Missouri Riverboat Casino

Bender Shipbuilding & Repair Co., Inc. launched the *Lucky 7*, a 232-ft. (70.7-m) riverboat casino set for operation on the Missouri River at Randolph, Mo. near Kansas City

in June. Built for the Randolph Riverboat Company, Inc., *Lucky 7* was scheduled for delivery in August. The *Lucky 7* is a replica of a traditional river sidewheeler and measures 232 ft. long, 78 ft. wide and 14 ft. deep. The riverboat will have more than 50,000-sq.-ft. of passenger space and 25,000-sq.-ft. of gaming space. The vessel, which will have 1,200 gaming stations, can carry 1,500 passengers and 300 crew.

Bender specifically designed the vessel for operation on the tumultuous waters of the Missouri River. The *Lucky 7* is powered by 2,400-hp Caterpillar engines driving three rotatable thrusters and is maneuvered by a 350-hp bowthruster.

For more information on Bender
Circle 141 on Reader Service Card

Nichols Widens Tridents Dominator

Trident Seafoods Corporation's F/V *Dominator* headed north to the Bering Sea with a load of crab pots on July 27. The trawler/crabber was sponsored in the Nichols Brothers Boat Builders, Inc. yards in Freeland. Four fish holds were widened. Port and starboard sponsons added 10 ft. (3.04 m) in width to the boat, increasing the size of the vessel from 124 ft. by 32 ft. (37.8 by 9.7 m) to 125 by 42 ft. (38.1 by 12.8 m).

For more information on
Nichols Brothers
Circle 140 on Reader Service Card

Surface Navy Association To Hold Seminar

The Surface Navy Association will hold its Seventh National Symposium, October 24 - 28, 1994 at the Sheraton National Hotel in Arlington, Va. The Surface Navy Association, a worldwide not-for-profit organization committed to improving professionalism in the U.S. Navy, most particularly its surface elements, has selected "Surface Navy - America's Forward Presence" as the theme for this meeting. For more information on the seminar, contact **Ruth Kane** at (703) 765-7447.

RTK Delivers Sea Truck To Greece

RTK Marine recently shipped one of its Series 5 Sea Truck Workboats to Greece. The 39.4-ft. (12-m) Sea Truck has been purchased by a private hotelier in Thessaloniki to transport tourists from the mainland to offshore islands in the Aegean Sea.

The GVF 512 has a completely open foredeck, giving maximum carrying space. One of the customer's main requirements for this craft was to transport tourists and vehicles on deck. The bow ramp, which is a standard feature together with its beaching capability, make this craft suitable for this particular operation. The craft is powered by twin Volvo Penta diesel engines.

For more information on RTK Marine
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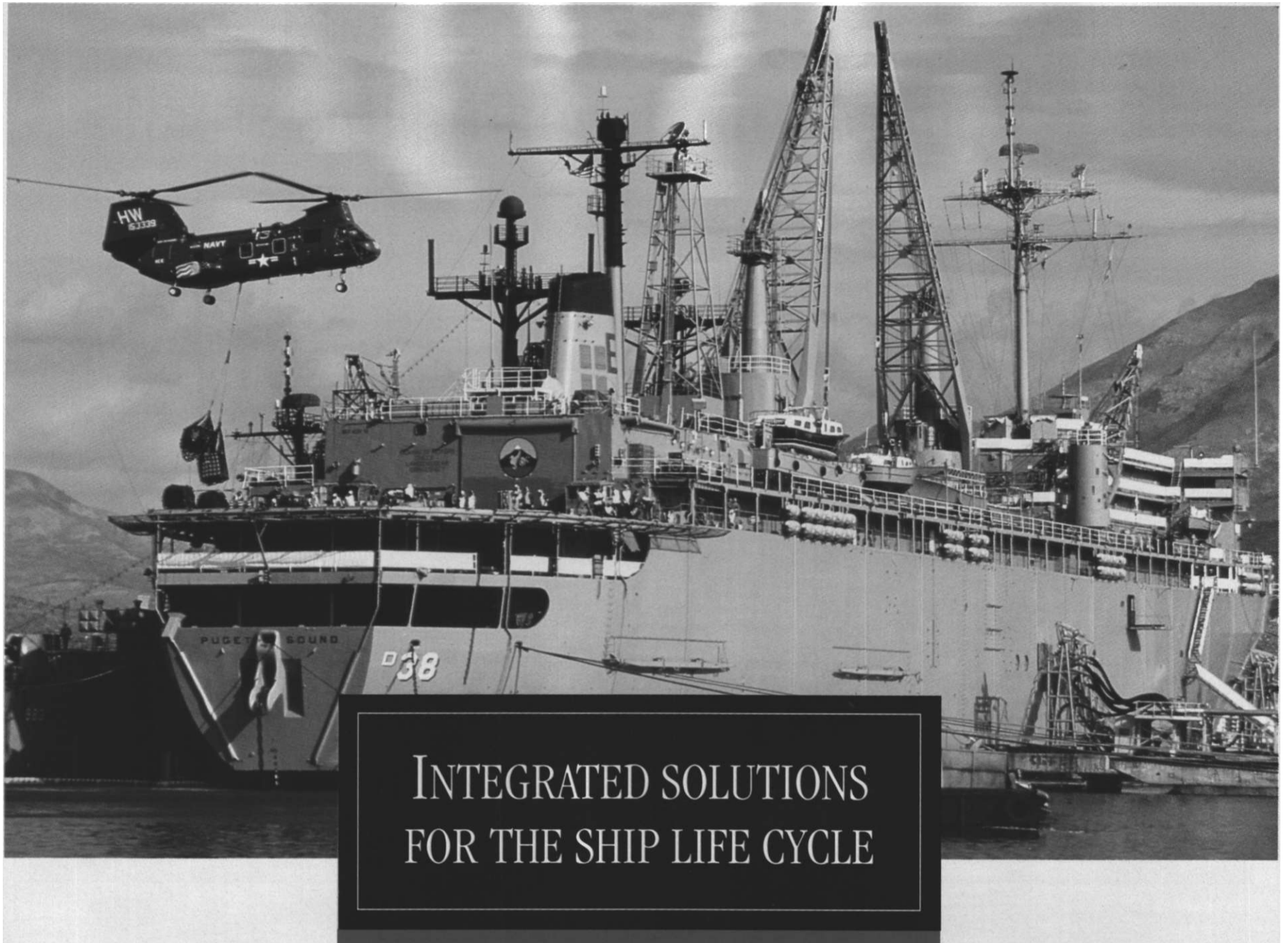
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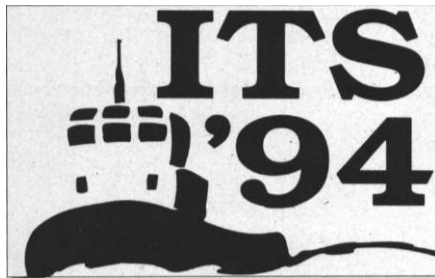
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SHOW PREVIEWS

ITS '94 To Feature Tugs, Safety, Live Inmarsat Demonstrations



Southampton, U.K. — October 17-21

The International Towing and Salvage Convention & Exhibition (ITS '94) will be held at the Grand Harbour Hotel, Southampton, U.K.

In addition to a program of speakers representing eight countries, there will also be a display of new tugs, a demonstration of a new Emergency Towing System, and a live link-up via Inmarsat with a salvage tug, as well as an exhibition of the latest products and services available to the industry. Chairing the convention will be **Mike Allen**, partner of Herbert Smith, London.

For more information on ITS '94, contact The ABR Co. Ltd., Dunelm, Church Rd., Claygate, Esher, Surrey KT10 OJP, U.K., tel: +44 372 468387; fax: +44 372 468388.

Pacific Fishing Exchange October 20-22

The Pacific Fishing Exchange will be held October 20-22 at Port of Seattle's Pier 48 on the downtown waterfront near Pioneer Square. The 100,000-sq.-ft. building will house all exhibits and show events, including the seminars, demonstrations, the Fishermen's Rodeo, and SeaBOP, a benefit dance for salmon habitat restoration. Boat trials and on-the-water demonstrations will be staged from barges tied to the pier.

Show Manager **Gerry Davis** was pleased with the interest the show generated. "We knew there was interest in a locally produced show with the kinds of features we're offering, but we (were) surprised by how quickly the industry ... responded." By the end of June, 150 of the booth spaces had been sold.

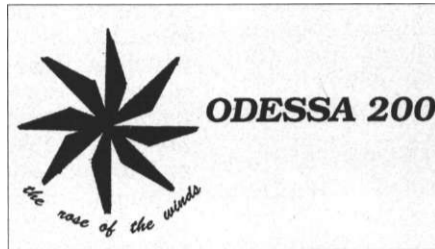
For more information, contact **Bruce Buls**, Pacific Fishing Exchange, 1515 Northwest 51st St., Seattle, Wash. 98107, tel: (206) 789-5333; fax: (206) 784-5545.

Stolt Selects MMS' FleetWORKS For Tankers, Houston Office

Stolt Parcel Tankers, Inc. selected Marine Management Systems' (MMS's) FleetWORKS, an inventory and maintenance software system, for six chemical tankers and shoreside at its Houston, Texas office. Subsequent installations are planned over the next 12 months for the remainder of Stolt's 60-ship fleet. Stolt is utilizing FleetWORKS for equipment management, spare parts inventory, consumable inventory, requisitioning and planned maintenance.

"FleetWORKS offers Stolt the ability to effec-

New Show Attracts Exhibitors From 16 Countries



Port of Odessa, Ukraine — October 18-20

The 200th anniversary of the City Port of Odessa marks the launch of the new International Sea and River Shipping Exhibition and Conference (Odessa 200), to be held at the Passenger Terminal Building, Port of Odessa, Ukraine.

Supported by the Domestic Shipping Community of Ukraine, this new event has attracted foreign exhibitors from more than 16 countries.

The International Maritime Organization (IMO), the International Ship Managers Association, and the American Bureau of Shipping (ABS) are among the contributors to the exhibition and conference.

Ukraine, the 149th member^tate of the IMO, has turned its attention to the Worldwide debate on maritime safety, pollution and the environment and wishes to focus on the leading maritime issues facing the Black Sea region and the Sea of Azov.

For more information on Odessa 200, contact **Roderick Keay**, Dolphin Exhibitions Ltd., 112 High St., Bildeston, Suffolk IP7 7EB, England, tel: +44 449 741087; fax: +44 449 741628.

Odessa 200 Exhibitor List (partial)

ABB	International Marine Paint
American Bureau of Shipping	Kockums Computer Systems
Aquamaster-Rauma	Krupp Fordertechnik
Atlas Elektronik	Lloyd's Register
Autronica Marine	Lloyd's Ship Manager
Bremer Vulkan Verbund	Marioff Hi-Fog
Cyprus Ports Authority	Megaship
Det Norske Veritas	Norsafe
Dieselmotorenwerke Rostock	Racal
Geislinger	Shipbuilders Association
Germanischer Lloyd	Transas Marine
Helkama Cable	Wartsila Diesel
	Zodiac

tively consolidate maintenance and inventory information for remote ship and shore locations," said **Robin de Goutiere**, preventative maintenance manager at Stolt. "Shore personnel can immediately perform fleet-wide analysis and generate reports with FleetWORKS for cost-efficient ordering and overall streamlined fleet management."

MMS incorporated a variety of enhancements which Stolt required into the latest FleetWORKS release. One such customization is an interface between FleetWORKS and Stolt's existing AS400-based Purchasing System. This seamless interface allows requisitions to be created onboard the vessels and sent electronically to the buyer's

Gastech To Focus On New Technologies In LNG/LPG Segment

GASTECH 94

Kuala Lumpur, Malaysia — October 25-28

Gastech '94 is the 16th international LNG/LPG conference and exhibition, to be held at the Putra World Trade Center in Kuala Lumpur, Malaysia.

The Gastech '94 Conference, held every two years, will again provide the natural gas, LNG and LPG business communities with an opportunity to interact and to discover new developments in their industry within the business atmosphere of this event.

The Gastech Exhibition is reportedly the world's largest for the liquefied gas industry, and all the current technical innovations will be on display, as well as services and a wide range of related products.

The choice to hold Gastech '94 in Kuala Lumpur, Malaysia (one of the world's most active LNG exporting nations), was made so that those attending could take advantage of the scale of activity and the business opportunities in the Pacific Rim.

For more information on Gastech '94 Conference and Exhibition, contact: Gastech '94 Secretariat, Glen House, 200/208 Tottenham Court Road, London W1P 9LA, England, tel: +44 71 436 9774; fax: +44 71 436 5694.

Gastech 94 Exhibitor List (partial)

American Bureau of Shipping	Kvaerner Moss Technology
Arab Oil & Gas	Lloyd's Register of Shipping
BoelwerfVlaanderen	Mannesmann Demag Verdichter
Chantiers de l'Atlantique	Maritime Reporter & Engineering News
Daewoo	MIB International
Det Norske Veritas	Mitsubishi Heavy Industries
Diesel & Gas Turbine	Mitsui Engineering
GEC Alsthom Velan	Newport News Shipbuilding
Howaldswerke Deutsch Werft	Nippon Kaiji Kyokai
Hitachi Zosen	NKK
Hyundai Heavy Industries	Petronas
IbEDA	Sabroe Marine
Ishikawajima-Harima Industries	Samsung Heavy Industries
Kawasaki Heavy Industries	Sumitomo Heavy Industries

desk. "In all," says **Ken Bloom**, Stolt's business systems manager, "the introduction of FleetWORKS represents a significant re-engineering of the entire purchase practice. We expect to realize significant benefits from a variety of fronts."

MMS also consulted Stolt in the design of its spare parts inventory and planned maintenance databases. By utilizing a combination of equipment identifiers across the fleet and specific manufacturer's codes, Stolt effectively manages its FleetWORKS systems on both a class-by-class basis as well as a fleet-wide basis.

For more information on MMS
Circle 16 on Reader Service Card

COMSAT President To Deliver Keynote Address At Satellite Communications Users Conference

Bruce L. Crockett, president and CEO and a director of COMSAT Corp., will discuss the issues surrounding privatization at the 16th annual Satellite Communications Users Conference (SCUC), to be held September 19-21 at the Sheraton Washington Hotel in Washington, D.C.

SCUC attracts professionals from all facets of the industry, including satellite operators and common carriers, telecommunications equipment manufacturers, data communications managers and corporate and ranking government officials.

This year's opening session features a roundtable discussion entitled, "The Information Super Highway: Open Road or Dead End Street?"

Leaders from all areas of the satellite communications industry, including decision-makers from the White House, Capitol Hill, the State Department and the Federal Communications Commission, will lead discussions in different sessions. Sessions fall into one of the follow-

ing four categories: User Track, Issues Track, International Track and Engineering Track.

A day before SCUC '94's official kickoff, participants have the option to attend special educational workshops called "Fast Tracks." During these workshops, participants learn how to implement digital compression, a new technology, and what they should consider when buying or leasing a very small aperture terminal system (VSAT).

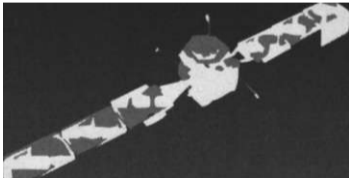
Attendees of SCUC '94 will meet communications professionals from countries in Asia, Latin America, Europe and the U.S., debating issues concerning direct broadcast satellites, mobile satellite services, launch systems and VSATs. Panelists will explain, from an end-user perspective, how satellite systems are helping define the European community.

For more information on SCUC '94, contact Argus Trade Shows, 6151 Powers Ferry Road, N.W., Suite 300, Atlanta, Ga. 30339, tel: (401) 618-0423; fax: (401) 618-0441.

SCUC '94 Exhibitor List (partial)

Baird Satellite Supporting Systems Ltd.
Comtech Antenna Systems, Inc.
ETM - Electromatic, Inc.
Fairchild Data Corp.
Fujitsu
IDB Communications Group, Inc.
Mackay Communications, Inc.
Magnavox
Micom Communications Corp.
Mitec Electronics Ltd.
MTI
NASA's ACTS Program

NEC America, Inc.
Radyne Corp.
Satellite Engineering Group, Inc.
Satellite Export & Engineering
Satellite Technology Management, Inc.
SSE Technologies, Inc.
SSPA Microwave Corp.
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Bernard J. Ebberts, president and CEO of LDDS, said, "LDDS is rapidly achieving one of its four stated goals that includes being a significant and major player in the international arena. The acquisition of IDB by LDDS is a tremendous opportunity to complement and expand the domestic and international growth potential of each company. This is an important acceleration of our strategy to penetrate the lucrative segments of the international market, but it is only a first step."

For more information on IDB
Circle 66 on Reader Service Card

Sonsub Awarded Contracts From McDermott, Texaco

- Sonsub was awarded a contract by McDermott Incorporated to assist in the installation of a platform for Oryx Energy in High Island 385A in the Gulf of Mexico. Sonsub will mobilize a 75-hp Triton Advanced Remotely Operated Work System (AROWS) and a Viper Remotely Operated Vehicle (ROV) to perform the work, scheduled to take place in October.

- Sonsub North Sea has been awarded a contract by Northern Ocean Services, a McDermott company, to provide trenching, ROV and survey services to support the Conoco Heidrun project. Under this contract, Sonsub will provide a vessel, the *Veslik Viking*, a Flexjet II Cable and Pipeline Burial System, a ROV and positioning services.

The work includes the trenching of three 15.5-in. nominal outside diameter flexible flowlines and three four-in. diameter umbilicals.

A total distance of approximately 12.5 miles will be trenched. Work began in June. Sonsub was awarded this contract following the successful completion of trenching operations on the Saga Tordis infield line which Sonsub North Sea performed under contract to Rockwater.

- Sonsub has been awarded an annual platform inspection contract by Texaco to inspect four platforms in the Gulf of Mexico. Sonsub will mobilize a 20-hp Viper ROV to perform general visual fly-by inspections and Cathodic Protection (CP) surveys. Video survey data will be recorded and analyzed using Sonsub's new video frame-grabbing software. The work began in July.

Sonsub recently completed similar platform inspection contracts for Marathon and Shell Offshore.

For more information on Sonsub
Circle 17 on Reader Service Card

Thor Dahl Shipping Expands To South Pacific

A/S Thor Dahl Shipping of Sanderjord, Norway has purchased South Pacific InterLine (SPI) from Reederi AB Gotland of Visby, Sweden.

Thor Dahl Shipping assigned its San Francisco-based shipping company, South Seas Steamship (SSS), full responsibility for managing SPI's vessels, including scheduling and port calls into Tahiti, American Samoa, Western Samoa, Tonga, Fiji, New Caledonia, Australia, Papua New Guinea and Hawaii.

Under the cooperative agreement, both SSS and SPI will maintain separate identities.

SSI has already taken steps to rationalize the service. The 450-TEU *Kochnev* will be replaced with a larger and faster vessel that will join the 700-TEU *Moana Pacific* in a rotation that cuts round-trip transit time by nearly a week between North America, the Pacific Islands and Australia.

SSS added the 256-TEU *ApoZZo* to make dedicated calls directly between Southern California and Pago Pago, where it primarily serves the tuna cannery there.

Cresmont Awarded Lease To Oregon Marine Industrial Site

The State of Oregon Land Board approved a lease of the Columbia River marine-industrial site at North Tongue Point in Astoria. Cresmont, a Seattle-based company specializing in marine technical and management services, will develop and manage the property for the next 30 years.

The North Tongue Point is a prime marine-industrial site. Its 140 acres offer direct access to the Columbia River channel (second largest river system in the U.S. and gateway to the Pacific Rim) and direct highway and rail access to Portland and the nation's inland transportation system. There are 40 acres of upland area served by a 34-ft. (10-m) deep channel directly off the end of five concrete and steel finger piers totaling 7,500 ft. (2,286 m) long.

The U.S. Army Corps of Engineers is currently working with the Oregon Dept. of Environmental Quality (DEQ) on a base-line survey as part of an overall Environmental Remediation Study, which will provide information on the site's current environmental conditions.

Princess Cruises Uses Precision Instruments From FCS, Inc.

Princess Cruises equipped both the *Pacific Princess* and *Island Princess* with new precision instruments. The instruments are the MALIN 3000 Diesel Engine Analyzer and MALIN CDM Crankshaft Deflec-

tion Meter.

The MALIN 3000 is a portable diesel engine analyzer which reportedly increases the speed, accuracy and reliability of determining the health of the main and generator diesel engines.

The MALIN CDM is a portable crankshaft deflection meter which reportedly permits quick, accurate and reliable determination of the crankshaft deflection of diesel engines.

For more information on FCS, Inc.
Circle 101 on Reader Service Card

Crowley Signs Three-Year Time Charter With Tosco

Crowley Marine Services, Inc. signed a three-year Time Charter agreement with Tosco Refining Company under which Crowley Marine equipment will be used to transport clean petroleum products in support of Tosco's West Coast distribution system.

The Crowley vessels placed under time charter are the oil barge *450-6* and the tugboat *Guardsman*. The *450-6* is a 400-ft. (122-m) by 100-ft. (30-m) by 25-ft. (7.6-m) vessel is capable of carrying a total of 16,200 long tons of cargo in 20 cargo tanks. The barge is outfitted with a vapor collection system, which prevents the escape of gasoline vapors into the atmosphere.

SCN Container Line Linking South Florida, 12 Latin American Countries

SCN Container Line Inc. initiated independent service linking the three major ports of South Florida with 18 ports in a dozen countries in Central America and South America.

Led by South Florida shipping industry veterans **Fernando Bowen** and **Raymond M. Hernandez**, SCN Container Line began service this spring, offering intermodal rates and bills of lading on less-than-truckload (LTL) shipments as well as full containers.

SCN Container Line operates receiving terminals in Miami, Los Angeles and Chicago, and plans to open a New Jersey terminal later this year.

Utilizing the Port of Miami, Port Everglades and the Port of Palm Beach, SCN Container Line offers weekly service to and from the Central American countries of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama.

South American countries on SCN Container Line's schedule of service every 12 days include Venezuela, Colombia, Ecuador, Peru, Chile and Argentina.

SCN Container Line's Miami receiving terminal and fully computerized headquarters is located at 1820 N.W. 94th Ave., Miami, Fla. 33172-2329, tel: (305) 592-6266; fax: (305) 477-0666.



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 - Seattle _____ Thurs. November 3 •
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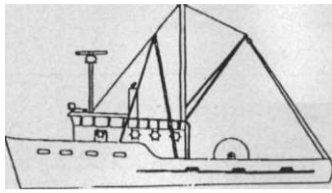
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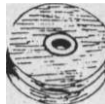
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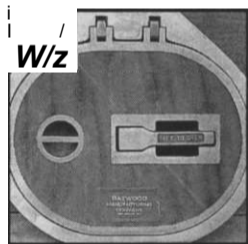


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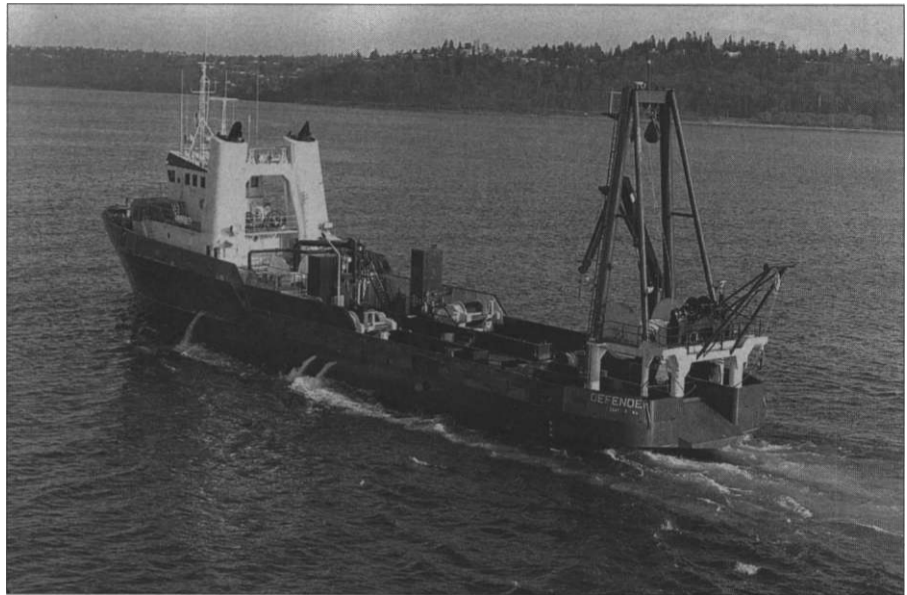
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Circle 346 on Reader Service Card

Fish Expo '94 - Boston

October 13-15, Boston, Mass.



More than 11,000 commercial fishermen, vessel owners and builders, suppliers and manufacturers, and workboat owners and operators will gather at the Fish Expo '94 Boston commercial fishing show in Boston. The show is held every two years and is billed as the Atlantic Rim's most important commercial fishing event. The new site for the show is the World Trade Center, chosen for its location next to the City Fish pier and cutting houses, its easy access via the Harbor water-taxi system, and its proximity to the in-water displays and demonstrations,

as well as to the area's restaurants and hotels. Fish Expo Boston is considered a must-attend function for marketing products and services to the entire eastern seaboard, from Florida to the Canadian Maritimes, as 93 percent of the buyers attending Fish Expo Boston are reportedly from the North Atlantic Rim.

For more information on Fish Expo '94 Boston, contact Diversified Expositions, 5 Milk Street, P.O. Box 7437, Portland, Me. 04112-7437, tel: (207) 772-3005; fax: (207) 772-5059.

Fish Expo '94 Boston Exhibitor List (partial)

ACR Electronics Inc.
Alaska Diesel Electric
Alden Electronics Inc.
Alfa-Laval Marine & Power
American Marine Products Inc.
American Mobile Satellite Corp.
Ameron Marine Coatings Div.
AT&T Maritime Services
AutoSHIP Systems Corp.
Baywood Inc.
Bird Johnson Co.
Blohm + Voss AG
BOATRACS Inc.
Carderock Div.
Caterpillar Inc.
Coastal Hydraulics, Inc.
ComNav Marine
COMSAT Maritime Services
Corrosion Technologies Corp.
Crewsaver Life Rafts/
SMR Technologies
Cummins Engine Co.
Datrex Inc.
Deere & Company
Detroit Diesel Corp.
Devoe Coatings
Dole Refrigerating Co.
Electronic Marine Systems Inc.
Frotronc Inc.
Furuno USA Inc.
Glamox Canada
Grinnell Corp.
Hammonds Fuel Additives Inc.

Hull Electronics Co.
ICOM America Inc.
Ingersoll-Rand
International Paint/
Courtalds Coatings
Johnson Pump of America Inc.
Kenwood USA Corp.
Kobelt Manufacturing Co. Ltd.
Koden International Inc.
KYB Corp. of America
Laser Plot Inc.
Lister-Petter Inc.
Litton Special Devices
Lokata Ltd.
Lowrance Electronics Inc.
Mackay Communications Inc.
Magellan Systems Corp.
Magnavox Electronic Systems Co.
MAN Marine Engines
MARCO Seattle
Marine Hydraulics
Marine Travelift Inc.
Maritime Reporter & Engineering
News
Massachusetts Maritime Academy
Matrix Technologies Inc.
Michigan Wheel Corp.
Mobile Telesystems, Inc.
Morad Electronics
Motorola Inc. Radius Marine Division
MP Pumps Inc.
National Oceanic & Atmospheric
Admn.

NOAA/National Marine
Fisheries Service
Orkot Engineering Plastics Inc.
Raychem Corp.
Raytheon Marine Company
Rice Propellers
Ritchie Navigation
Robertson Marine Electronics
Sabroe Canada
Sea-Fab Inc.
SEA Inc.
Simrad Inc.
SI-TEX Marine Electronics Inc.
SMI Refrigeration
SMR Technologies Inc.
Spurs Marine Manufacturing
Inc.
Standard Communications
Corp.
Texaco Lubricants Co.
Trimble Navigation Ltd.
Turbo Marine Co.
Twin Disc Inc.
U.S. Coast Guard
Viking Life-Saving Equipment
Volvo Penta North America
Inc.
Washburn and Doughty
Assoc., Inc.
Wesmar
Willard Marine Inc.
ZF Industries
Zodiac of North America

Raytheon Subsidiary Teams With Scottish Firm On Undersea Project

Applied Remote Technology, Inc. (ART), a California-based Raytheon Company subsidiary, teamed with a Scottish firm to conduct a laser imaging pipeline survey in the North Sea.

ART and Aberdeen-based SubSea Survey (a division of SubSea Offshore), used ART's LS-4096 underwater laser line scan system to conduct tests. The team deployed the system on the *SubSea Focus* Remotely Operated Tow Vehicle (ROTV). These trials were carried out on the *M/V British Viking*. The vessel was contracted to EMC, which is the pipeline contractor to Statoil for the Europipe and Zeepipe II projects.

The LS-4096 provided high resolution real-time video imagery of the pipeline debris such as entangled fishing nets, discarded hardware, and the seabed around the pipeline. The real-time pan and zoom capabilities of the LS-4096 made it possible to determine the condition critical elements of the pipeline such as field joints and anodes.

For more information on ART
Circle 71 on Reader Service Card

Freeman Marine Equipment Offers Complete Catalog

Freeman Marine Equipment, Inc. is offering a catalog on its wide range of marine products. From hatches, scuttles, manholes and doors to portlights, windows and accessories including gaskets, line handling and bulwark hardware and tiedowns, this complete, 100-page-plus catalog includes complete product specifications and descriptions of almost every kind of equipment needed to outfit a vessel. The catalog is intended to be easy to understand by engineer and layman alike, with a glossary of industry terminology included.

Freeman says its products have been proven in every marine environment, having been built to withstand harsh and abusive conditions with corrosion-resistant marine alloys and other quality materials.

For more information on
Freeman Marine Equipment
Circle 81 on Reader Service Card

Schichau Seebeckwerft Delivers *Contship Singapore*

Schichau Seebeckwerft AG recently named and delivered the 529-ft. (161.3-m) *Contship Singapore* to owner Conti Reederei, Putzbrunn near Munich. *Contship Singapore* will be managed by Niederelbe Schiffahrtsgesellschaft GmbH & Co. KG, Buxtehude (NSB) and enter a long-term charter with Contship Container Lines, Ipswich, U.K. The ship is of a modified type BV 1600. The modifications to the basic design include: a 1,687-TEU capacity over the original 1,599; 152 refrigerated container plugs as opposed to 70; an additional generator to

handle the drain from the additional reefer plugs; and a seven-cylinder engine instead of a six-cylinder. The engine is a Bremer Vulkan/MAN B&W type 7 L 60 MC developing 13,125 kW, allowing for an increase in speed from 18.3 to 19.1 knots. The newbuilding was built to the rules of Germanischer Lloyd to its class GL 100 A4 E, "Containerschiff" + MC, E, AUT.

For more information on
Schichau Seebeckwerft
Circle 2 on Reader Service Card

Racal-Decca To Supply Five Bridge Systems To Korea

Racal-Decca Marine won a contract to supply its Modular Integrated Radar and Navigation System (MIRANS) integrated bridge systems for five VLCCs being built for Shell International Shipping by the Daewoo Corp. in Korea.

Each MIRANS features two of Racal-Decca's BridgeMaster 340

ARPA radars, the latest addition to the BridgeMaster radar series.

Racal-Decca's Korean licensee, the Daeyang Electric Co., will be responsible for installing and commissioning the five MIRANS systems aboard each of the new double-hulled 280,000-dwt tankers.

The first VLCC is set for delivery to Shell in 1995.

For more information on Racal-Decca
Circle 94 on Reader Service Card

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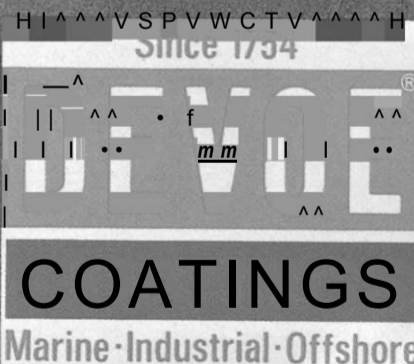
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of existing antifoulings, and provides excellent protection in both static and dynamic conditions.

For more information about ABC #3 and our complete line of high-performance coatings, contact the Devoe Coatings representative near you.



Great news!



Picture from the book "Shipyards through times", published by Astilleros Espanoles.

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Navatek II Features Unique Fixed Stabilizer With Split Rudder System

Navatek II is the second twin strut SWATH vessel for which **Raymond H. Richards, P.E.** has served as the principal naval architect and marine engineer. Joining her larger predecessor, *Navatek I*, both were designed and built under the banner of Navatek Ships, Ltd., one of the subsidiaries of Pacific Marine, Honolulu.

The 149-passenger, 86-ft. (26.2-m) *Navatek II* operates out of Lahaina and Maalaea, ports on the island of Maui.

The propulsion package includes twin MTU 12V183 TE02 engines with ZF 255, 3.5:1 reverse/reduction gears. The shafts are Aquamet 17, the wheels are by Bird-Johnson.

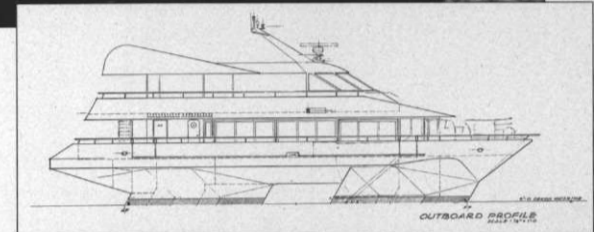
Working with hull forms designed and tank-tested by Pacific Marine Engineering Science Co. and Navatek Ships, Mr. **Richards** developed the hull structure as well as the propulsion and steering system designs for both. He also did the submarine-style (vent and blow), active ballast system in *Navatek II*. Both vessels are reportedly approved for full ocean service.

Navatek I is made of a 140-by 54-ft. (43-x 16.5-m) steel carrier vessel with a resiliently mounted, aluminum passenger module, whereas *Navatek II* is all aluminum. The carrier vessel and superstructure were computer lofted by Specialty Marine of Scappoose, Oregon. Vessel internals and shell plating were plasma cut and formed by Sovereign Yachts of Seattle. One of *Navatek II's* unique features is the fixed stabilizer with split rudder system created by Mr. **Richards** and fabricated and assembled at Tarheel Aluminum in Coos Bay, Ore. The superstructure was fabricated by Sovereign and transported by barge to Honolulu. For both weight and cosmetic purposes, the thinner panels used in the superstructure were bonded to their stiffeners with adhesives.

The seakeeping characteristics of the twin-strut SWATH are augmented by a ballast system which is computer controlled to automatically compensate for the movement of passengers, as well as such influences to heel and trim as wind.



The sensory and computer system was developed by Lockheed's Marine Group in Sunnyvale, Calif. Control of active canard fins, by Koopnautic, is also integrated through the onboard computer.



Keels & Appendixes

by
Nils Lucander, designer

Nils Lucander, based in Tacoma, Wash., has designed boats for more than 40 years. The views and claims presented in the following article are those of Mr. Lucander, and do not necessarily reflect the views of the Maritime Reporter & Engineering News staff, but are merely a vehicle to present a viewpoint and foster discussion.

During the latter part of World War II, **John L. Hacker**, the famous powerboat designer in Detroit, invented what he called the Fairline Strut (see Fig. 2) which looked like a fish's anal fin. Its function was to eliminate detrimental rotational turbulence caused by the propeller shaft, (see Fig. 3)

This turbulence is approximately four times larger than the shaft diameter, and runs from

where the shaft emerges to the propeller and beyond. Mr. **Hacker's** invention reduced this to just .5-in., and in the process, according to Navy tests, improved propeller efficiencies from 16 to 22 percent.

After the war, Mr. **Hacker** designed the Fairline Strut into his unlimited racing boats *My Sweetie* and *Miss Pepsi*, increasing the vessel's speeds while preventing skidding. Several of his powerboat designs were also fitted with these, most notably the 72-ft. (21.9-m) *Mercury V*, adding to its performance.

I worked with Mr. **Hacker** from 1952 to 1960, when he died at age 84. During the following years I designed derivations, Fairline Fins used to retrofit open shaft installations, followed by Log Knocker Fins extending below propeller depths, (see Fig. 1)

In 1975 I received a request for the design of a 78-ft. (23.8-m) fishing trawler, a boat which was to have twin aft engines, short level shafts

and full protection for propellers and rudders.

After considering several options, the center keel was eliminated and two husky ones were added, one on each side halfway out to the waterline from the centerline of the boat. In length, they ran from near midships to stern posts and were so large the engines fit partly into them. The bottom of the keels and forward center hull were in line so the boat could be beached, hauled, stored and transported without need for cradles or supports, like an aircraft landing gear. It became known as the "3-Point" concept.

The first pleasure boat was a 52-ft. (15.8-m) trawler yacht in 1979. In 1994 the owner, a charter boat captain in Panama City, Fla., praised the smooth reduced roll even in heavy weather.

In 1981 I designed an 80.5-ft. (24.5-m) commercial tug for the Cheramie Brothers in Louisiana, built by St. Charles Steel Works Inc. and featured in several national publications after launching in 1982. A year later, St. Charles launched an 85.5-ft. tug, operated by **N.J. Bourgeois, Jr.** as part owner, part skipper. In 1985, it was caught by the 120-mph Hurricane Elena, and when asked afterwards what happened during the storm, he said: "I don't know, I was off over

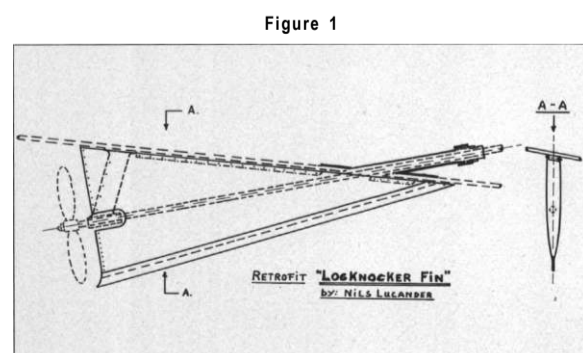
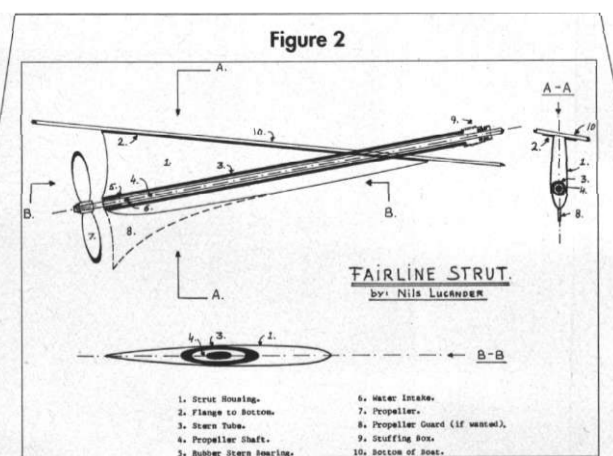


Figure 1



Nils Lucander has been designing boats for more than 40 years, and by his own admission, has taken pleasure in challenging traditional thought in regards to keel and appendix design and function. Pictured are: the LogKnocker Fin (Fig. 1); the Fairline Strut (Fig. 2); and a diagram of propeller shaft turbulence (Fig. 3).

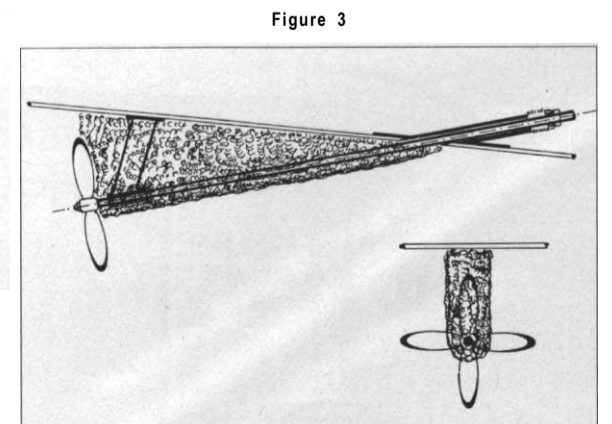


Figure 3

watch and slept through it all."

Both the Cheramies and Bourgeois stated these "3-Point" tugs simply would not roll. In addition, due to the undisturbed flow of water to propellers, they were able to handle tow jobs equal to other tugs with up to 50 percent more power. At last report, the first tug was being operated by American Marine in Houston; the second by Foss Maritime in Port Angeles, Wash.

In the 1980s I designed several aluminum fishing boats fitted with skinny aft keels housing only the shaft logs and shafts.

To attain shallow draft, the keels were in part

tucked in under the bottom and the new concept called "3-Point Gullwing" designs. Four of these are presently fishing in the Bering Sea and are noted for stability and performance.

Most open shaft installations have propeller slips ranging from 30 to 35 percent; up to 75 percent for poor installations. My fin and aft keel designs have ranged from 18 to 25 percent. The Cummins service manager in Anchorage said: "So far, we are seeing on that Gullwing hull design that the engines are consuming 30 to 40 percent less fuel than what the engines are rated at. This is 10 engines in five boats. There is

something about the hull design that allows those engines to get better fuel economy than what they're dyno tested at."

In one of its newsletters, Cummins Engine Co. claimed a 30 to 40 percent fuel savings by the 80.5-ft. tug fitted with a pair of its 980-hp engines. Both the Cheramies and Bourgeois support this claim coming from users, not this writer.

Being conservative when it comes to performance claims, I question the high fuel savings, but even if just half, they are substantial, proven

(Continued on page 110)

OPA 90 UPDATE

Tanker Escorts, COFRs Fill OPA 90 Agenda

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Oil Mop, Inc. has long been recognized around the world as the proven leader in oil spill response, hazardous materials training, and spill response equipment. Now, our experience works for you to provide a total management solution to OPA 90 requirements.

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Port State Control Initiative

In April 1994, the U.S. Coast Guard (USCG) instituted what is deemed by many to be the most rigorous program in the world for eliminating substandard vessels from U.S. waters. The program, called the Port State Control Initiative, will have a sweeping effect on many types of vessels, but perhaps none moreso than tankers—whose perceived greater power to harm the environment often makes them subject to proportionally greater scrutiny by regulators.

Under the new system, a vessel will be targeted based on past violations of the its owner, flag state or classification society. Also, the names of those organizations the USCG deems to be endangering U.S. waters through the lack of safety controls on their vessels will be posted and made common knowledge. This practice has already led to protests by certain "posted" bodies. For a complete review of the Port State Control Initiative, see *Maritime Reporter's* June 1994 edition.

Trust Fund Replenishment & Access

The five-cent-per-barrel oil spill excise tax, which is used to replenish the Oil Spill Liability Trust Fund, was reapplied on July 1, 1994. The tax was discontinued when the fund had reached its \$1 billion limit, but recent major spills have depleted the fund significantly. Some have estimated the cost of the San Juan oil spill alone at \$100 million or more, and the insurance coverage for the barge *Morris J. Berman* which leaked the oil was inadequate to pay for damages. The USCG also currently has underway a study to examine costs incurred by federal agencies in cleanup and damage assessment and what access those agencies will have to the Oil Spill Liability Trust Fund. The study was due for comple-

tion in August 1994.

The COFR Conundrum

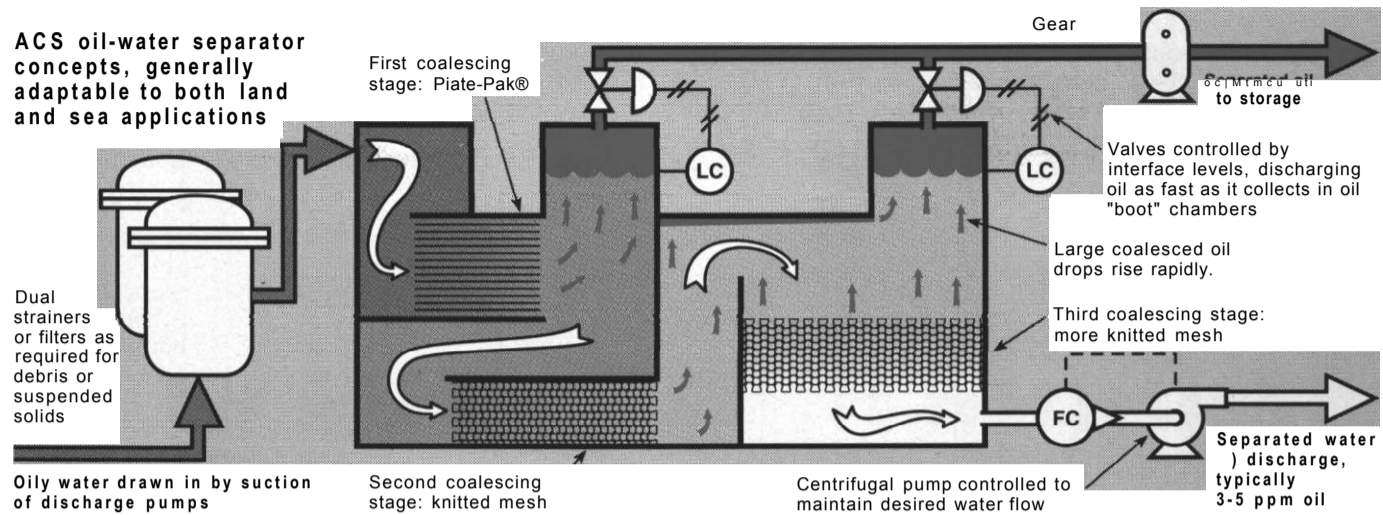
Just as one major spill provided the impetus for the passage of OPA 90, more recent major spills such as the one off San Juan earlier this year seem to have given extra urgency to the issue of Certificates of Financial Responsibility (COFRs). The San Juan spill underlined the importance of financial responsibility when it was discovered the owner of the barge reportedly had resources wholly insufficient to pay spill-related costs and damages.

On July 1, 1994, the USCG published an interim rule on financial responsibility for water pollution from vessels (59 FR 34210), which specifies what type of evidence vessel owners and operators must submit to the USCG to demonstrate ability to pay damages and removal costs in the event of oil or hazardous substance spills. The new rule implements portions of the Oil Pollution Act of 1990 (OPA 90) and the Comprehensive Environmental Response, Compensation and Liability Act (Superfund), both of which require vessel owners and operators to present "evidence of financial responsibility" of their ability to pay up to the limits specified in each law. The rule is designed to implement Congress' intent that a responsible party (rather than U.S. consumers and taxpayers) pays promptly and with assurance for removal costs and damages from an oil or hazardous substance spill. Superfund deals with releases of hazardous substances other than oil.

The new financial responsibility requirements draw heavily from the original September 1991 rulemaking proposal, but the USCG has made technical and implementation schedule changes in response to industry com-



Maritime Reporter/Engineering News



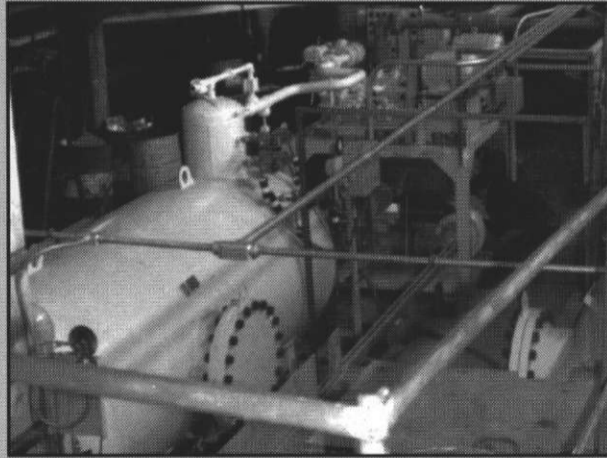
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ments. Some of the more significant changes are: the guaranty forms have been amended to state clearly the defenses that will be allowed guarantors; a defense that the guaranty provided to the USCG does not serve as a guaranty under state law, without the guarantor's permission, has been created; and a co-subscribing guarantor may choose to subscribe to a limited participation in a guaranty, altering the guarantors' joint and several liability in pre-

existing financial responsibility undertakings.

Several shipowners proposed the creation of a Mandatory Excess Insurance Facility (MEIF), a government-funded plan which would provide high levels of liability coverage as well as serve as a guarantor for the purpose of providing COFR coverage. The MEIF cannot be considered as a prompt solution in the COFR rulemaking, according to the USCG, because legislative action

would be required to effect it.

The MEIF is principally designed to alleviate shipowners' concerns about unlimited liability, not COFRs. The USCG concluded that the MEIF could not be adopted in the context of the COFR rule, but that it should be considered to address unlimited liability concerns.

Insurers and other providers of financial responsibility will be subject to direct action from claimants, as provided in OPA 90. However,

OPA 90 strictly limits a guarantor's liability to the amount of the guaranty provided. The COFR rule restates and reinforces the OPA 90 provision that a guarantor is not subject to unlimited liability.

The USCG also prepared a final Regulatory Impact Analysis (RIA). The RIA concludes that the rule will not cause a severe economic disruption. (This conclusion has been contested hotly in the industry.) Even if shipowners continue to prohibit their associations, the P&I clubs, from providing the financial responsibility guaranties, commercial sources say they will make guaranties available. The two cover facilities the USCG has cited so far are Shoreline and First Line, but at press time neither of these had USCG-approved means of covering vessels so as to allow them to obtain a COFR. Both the American Waterways Operators, a U.S. trade association for the U.S. inland and coastal barge and towing industry, and INTERTANKO, the international association of tanker owners, have testified before the House Subcommittee on Coast Guard and Navigation as to the problems they believe the COFR rule will cause.

An implementation schedule that allows a non-disruptive transition to compliance with the new rule is available from the USCG. Self-propelled tank vessels will generally be the first category of vessel required to comply with the new rule, by December 28, 1994. Non-tank vessels must comply when their existing COFRs expire, beginning December 28, 1994.

The effective date of the COFR rule is July 1, 1994. The USCG allowed 90 days for technical comments, which must be received before September 29, 1994 and mailed to the Executive Secretary, Marine

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VTS Participation Becomes Mandatory

The USCG has issued a final rule for establishing requirements and procedures for simplifying Vessel Traffic Services (VTS) regulations and making participation in all VTSs mandatory.

This rule will establish two levels of participation: "full" and "passive" participation. The first requires that the vessel comply with all communication, Vessel Movement Reporting System (VMRS) and general VTS operating rules. This class of vessels is defined as "VMRS Users" and includes power-driven vessels 131.2 ft. (40 m) or more in length, towing vessels 26.2 ft. (8 m) or more in length, and vessels certified to carry 50 or more passengers when engaged in trade.

Passive participation will require vessels to monitor designated VTS frequencies and comply with general VTS operating rules.

This class of vessels is defined as "VTS Users" and includes vessels that are either subject to the Vessel Bridge-to-Bridge Radiotelephone Act, or required to participate in a VMRS within the VTS area (VMRS User).

Safety Council (G-LRA/3406) (CGD 91-005), U.S. Coast Guard Headquarters, 2100 Second Street SW, Washington, D.C. 20593-0001.

Tanker Navigation & Escorts

A study on Tanker Navigation Safety Standards is being conducted in 12 parts and is expected to be complete by September 1995. Congress is reviewing each sub-study as it is completed and becomes available. The final rule was expected to be complete in August, regarding tankers operating in certain U.S. waters (PWS, Rosario Strait and Puget Sound, Wash.) where at least two towing vessels are required to escort all single-hull tankers greater than 5,000 gt. Another rule being developed will determine other areas in the U.S. where tankers over 5,000 gt will also require two escort tugs. The USCG is currently reviewing comments received on the Advanced Notice of Proposed Rulemaking; once all comments are reviewed, a Notice of Proposed Rulemaking (NPRM) will be issued. The NPRM is expected in October 1994.

USCG Final Rule On Single-Hull Tank Vessel Lightering Equipment

The USCG has established regulations requiring owner/operators of tank vessels without double hulls of 5,000 gt and above to carry certain emergency lightering equipment on board and provide the vessels' IMO international numbers in the Advance Notice of Arrival at Port to facilitate vessel identification. The rule is effective as of November 3, 1994, by which date

DGPS Given Go-Ahead In Northwest

The USCG prepared a programmatic Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for implementing a Differential Global Positioning System (DGPS) in the Northwest region of the U.S. The USCG published a notice to announce the availability of the EA and FONSI, and to solicit comments on them (59 FR 32745; June 24, 1994). The EA concluded that there would be no significant impact on the environment and that preparation of an Environmental Impact Statement will not be necessary.

The DGPS is a new radionavigation system that improves the accuracy of the existing Global Positioning System (GPS). The improved accuracy is critical for electronic navigation in harbors and harbor approaches. The DGPS, according to the USCG, will reduce the number of groundings, collisions, personal injuries, fatalities, and potential hazardous cargo spills resulting from such incidents.

The sites chosen for installation of DGPS equipment are near Fort Stevens, Ore.; Robinson Point, Wash.; and Whidbey Island, Wash.

all comments must be received, and represents the first step in designating structural and operational measures for tank vessels as required by OPA 90.

The documents mentioned are available for inspection at the Office of the Executive Secretary, Marine Safety Council, U.S. Coast Guard Headquarters, 2100 Second Street SW, Room 3406, Washington, D.C. 20593-0001; tel: (202) 267-6220.

Oil Mop Helps Companies Stay OPA-Compliant

Oil Mop, Inc. (OMI) is a developer and manufacturer of oil spill recovery equipment and other pollution control products, and has delivered more than 10,000 systems since 1970.

Last year, OMI was acquired by AMBAR Inc., a publicly held company which provides a range of ser-

vices to the oil and gas industry in Louisiana and Texas. AMBAR owns and operates a complex distribution network that includes dock facilities and stock points at 12 coastal locations on the Gulf Coast. Combining the strongest assets of both companies and building the organization around the requirements of OPA 90, OMI provides: oil spill response; spill response advanced planning; site analysis, risk assessment, contingency plans; personnel

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 For more information on Oil Mop Inc.
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Unitor Wins Largest Single Order For Oil Spill Kits

Norway's Unitor AS won its largest single order for its Oil Spill Kit. The order, valued at approximately \$500,000, comprises 76 kits for ves-

sels managed by the Acomarit Group, a major Unitor customer which manages a fleet of more than 180 vessels. The kits have been tailored to each vessel's requirements. The kits are made up of four different components — sorbents, emulsifiers, protection equipment and waste storage containers. The sorbents are available in a variety of forms, such as pads, rolls and booms. The kits also include environmentally safe emulsifiers plus a range of

personal safety and protection equipment such as gloves, boots, overall suits, disposal bags and hand cleaner.

For more information on Unitor
 Circle 3 on Reader Service Card

ECM Offers Variety Of Services

Environmental Crisis Manage-

ment (ECM) Inc. represents tanker owners accounting for hundreds of tank vessels trading to the U.S. regularly. Its reputation as a qualified spill response manager and Qualified Individual under OPA 90 has been earned on more than 160 spills since May, 1990 and, prior to its formation, ECM staff members were involved in numerous "significant spills" in the northeast during the last 20 years. ECM's services include: Vessel Response Plans (VRPs); "Qualified Individual" services; spill response management services; training; drills; and OSRO selection. To assist its clients, ECM also conducts oil spill seminars throughout the year.

For more information on ECM
 Circle 95 on Reader Service Card

RGF Marine's Bilge Pro™ : Two Models For Clean Bilge

RGF Marine Environmental Technologies, Inc., West Palm Beach, Fla., a member of RGF Environmental Group, has introduced the new Bilge Pro™ Models BP 20 and 50, advanced water processing systems for barge or land-based operations. The systems are designed to eliminate problems associated with strict discharge regulations and avoid U.S. Coast Guard fines.

The two models are capable of processing 20 and 50 gallons of water per minute, respectively. The systems utilize a proprietary matrix filtration and coalescing system to remove oil, fuel and other petroleum hydrocarbons from bilge water, reportedly producing discharge water considerably below the standard requirement of 15 parts-per-million of oil. The units are constructed of non-ferrous materials, reportedly require low maintenance and are fully automatic.

For more information on RGF Marine
 Circle 104 on Reader Service Card

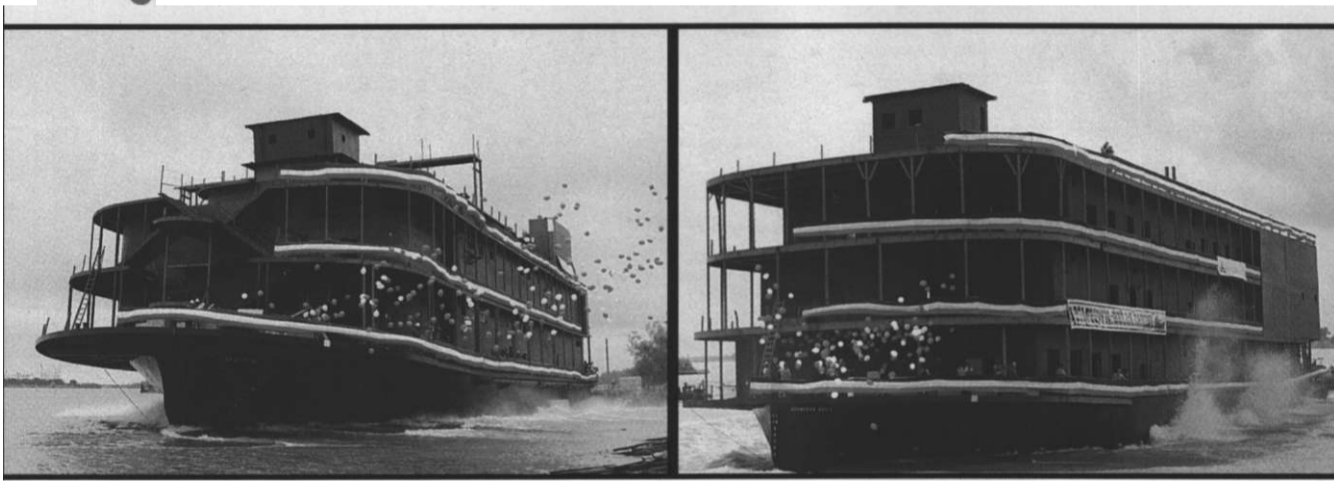
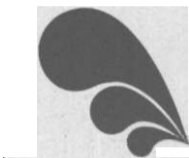
Riverside Marine's Bilge Bugs™ Speeds Oil Breakup

Riverside Marine Products of Hillside, N.Y. has developed Bilge Bugs™, a two-part cleanup and deodorizing agent engineered for a wide range of fuels and lubricants typically found in bilge — without the use of solvents or other compounds injurious to the environment.

The product works in two phases: Bilge Bugs Part A emulsifies the spill, breaking it down into microscopic particles and encapsulating each particle with a nutrient-bearing surface. This provides help eliminate odors and creates greater surface area, which accelerates natural biodegradation. Also, since natural evaporation is greatly reduced, so is the risk of vapor ignition. Bilge Bugs Part B contains bacterial cultures that consume both Part A and the fuels and oils it has encapsulated. Bilge Bugs contains none of the hazardous chemicals listed in OSHA Hazard Communication Regulation 29cfr 1900 1200(c). The products are available in just about any size necessary in various dilu-

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tions and containers for industrial use.

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Bilge Boy™ Chosen For N.Y. Fire Boats

Nelson Division recently was chosen to supply a Bilge Boy™ oil/water separator for installation in the City of New York's fire boat fleet. The city reportedly stated that the Bilge Boy was chosen because of its compact size, ease of installation, manual or automatic operating capability and reasonable cost.

The municipality also stated that the products will only be installed on the active boats in the city's fleet.

The Bilge Boy is approved by the U.S. Coast Guard and the IMO, is available in two capacity ranges (2.5 and 7.5 gpm), and has also recently been approved by the Russian Register of Shipping.

Nelson Division is a designer and manufacturer of exhaust and filtration systems and a subsidiary of Nelson Industries, Inc.

For more information on Nelson Division
Circle 105 on Reader Service Card

Edge: First Aid For Oil Spills

Edge Marine Marketing Limited has some 10 years of experience in marine services and maintenance products for the marine industry. Its products have reportedly been tried and tested within the marine community and are produced under strict quality control.

Edge offers a product range geared toward complying with OPA 90 and Marpol regulations. Included in that line is Envirosphere Oil Spill Dispersant, a new third-generation type 2/3 MAFF approved oil spill dispersant; and the Emergency Oil Spill First Aid Kit, which comes with full instruction and training manual in each kit. Kits are available for tankers, general cargo vessels, coastal vessels, ports and terminals, all at standards requested by IMO and the U.S. Coast Guard.

The Coastal Collector: MET's Inland Oil Spill Solution

Marine Environmental Technology (MET) incorporates an automated recovery and separation system on its self-propelled oil skimmer for inland waters, the Coastal Collector series. The Coastal Collector-27 has 200-sq.-ft. of deck space for boom handling and transport.

The spill recovery and separation functions are controlled by a microprocessor located inside the enclosed cabin. A color monitor is located at the operator's eye-level to provide user-friendly prompts and a visual representation of the recovery process. The automated spill recovery systems on the Coastal Collector series allow constant adjustments to the various spill and weather conditions.

For more information on MET
Circle 98 on Reader Service Card

Coastal Collector Specifications

Length.....	27 ft. (8.2 m)
Beam.....	10 ft. (3 m)
Height.....	11 ft. (3.3 m)
Draft.....	1 ft. (.3 m)
Draft (recovery).....	2.6 ft. (.8 m)
Displacement.....	11,000 lbs.
Storage capacity.....	1,100 gal.
Fuel capacity.....	300 gal.
Propulsion.....	450 hp
Speed.....	27 knots
Pump capacity.....	240 gpm

Edge also offers contingency planning and marine pollution training.

For information on the Edge Group
Circle 103 on Reader Service Card

MBI Seminar To Deal With San Juan Spill

The Maritime Bureau Inc. (MBI) of Savannah, Ga. will hold a seminar on Oil Spill Management from 9 a.m. to 1 p.m. at the Tower Hotel, St. Katherine's Way, London, England on September 30, 1994.

Capt. **Brian Dufour**, who was the spill manager of the 750,000-gallon oil spill caused by the grounding of the oil barge *Morris J. Berman* on January 7, 1994 in San Juan, Puerto Rico, will speak on spill management under OPA 90. Other speakers include Lloyds of London surveyor Capt. **Michael Hall**, who was resource manager during the same spill; **John Peck**, MBI president; and **Justin P. Healy**, public relations officer for MBI. Topics to be discussed include contingency planning, resource tracking, logistics and controlling costs. For further information contact **John Peck**, MBI, tel: (912) 236-6366; fax: (912) 236-1704.

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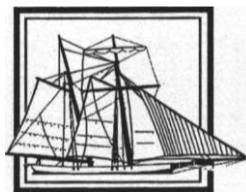
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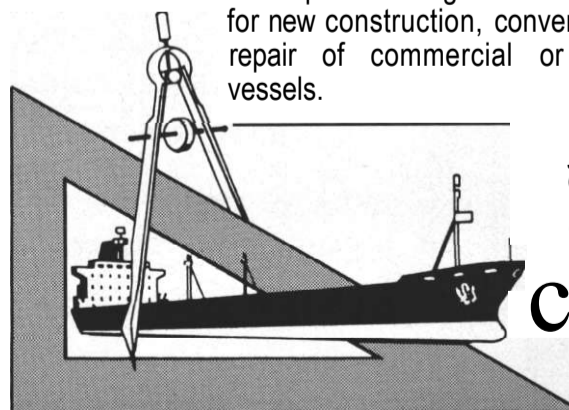
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Gallagher: Response Planning And Management

Gallagher Marine Systems, Inc. provides maritime casualty response planning and management, and provides expert technical support to shipowners, operators and underwriters.

Its personnel and associates were actively engaged in responses for the *Argo Merchant*, the *Valdez*, the *World Prodigy*, the *B.T. Nautilus*, Operation Desert Storm, and the recent Tampa Bay and San Juan spills. Gallagher says its staff ensures that its clients meet all OPA 90, U.S., and IMO oil spill prevention and response plan requirements — offering spill management team services, training courses and drills, vessel spill regulation and compliance assistance, chemical information systems and qualified individual services.

For more information on Gallagher
Circle 129 on Reader Service Card

CSI: Offering Systems For Compliance With U.S. Coast Guard Requirements

Compliance Systems Inc. (CSI) says it has been helping the marine industry comply with U.S. Coast Guard (USCG) requirements since 1988.

Its approach to regulatory compliance is designed to reduce delays, increase safety and document good faith efforts in regards to ship safety and environmental precaution.

CSI offers compliance through spill contingency planning, pollu-

tion response training, third party safety audits, and drug & alcohol screening.

CSI says its "Total Compliance Program" has been successful at satisfying USCG regulations. Each member vessel is provided with a Compliance Kit containing a multi-lingual manual together with stamps, adhesive posters, diagrams and procedures designed to meet the specifications of the U.S. Code of Federal Regulations.

Upon enrollment, CSI conducts a preliminary inspection of the vessel and identifies problem areas which need immediate action to avoid possible USCG violations.

By attending USCG inspections, CSI says it can overcome potential problems as well as language constraints.

CSI has also developed an OPA 90 ShipBoard Pollution Response Training Program designed to provide "painless" OPA compliance.

For more information on CSI
Circle 99 on Reader Service Card

Hyde Products Offers Full Spill Response Line

Hyde Products, which has been a supplier of ships machinery for over 125 years, now offers a full line of spill response equipment and custom-engineered systems. Hyde is prepared to offer its customers complete systems and turnkey engineering services for any product from a single skimmer or length of boom to a completely outfitted spill recovery vessel. Deliveries in 1993 of LORI brush systems include Clean Casco Bay, Alyeska, Clean Seas, Clean Bay and Clean Coastal Waters.

Hyde has supplied DESMI weir skimmers and pumps to U.S. Coast Guard strike teams, NRC, MSRC and other cooperatives. Hyde is also the exclusive distributor for Vikoma, a leading manufacturer of disc skimmers and inflatable oil containment booms.

Hyde's product line includes DESMI weir skimmers and heavy oil pumps; Vikoma "Komara" and "T-Disc" disc skimmers; LORI brush collecting systems; LPI inclined plane skimmer for VOSS and fast water applications; Hyde vacuum transfer pumps; containment booms; Kvaerner Eureka high capacity offloading pumps; Hyde diesel-hydraulic power packs; and hoses, reels, winches and other accessories.

For more information on Hyde Products
Circle 4 on Reader Service Card

Marshall Branson Marine Delivers Vessels To Korea



The first Marshall Branson Marine (MBM) oil skimming and boom deployment vessels, specifically designed and constructed to meet the requirements for rapid response to oil spillage incidents requiring immediate containment and removal, have been delivered for operation

in South Korea. The 42.6-ft. (13-m) boom deployment vessel and the 52.5-ft. (16-m) oil skimming vessel are based on the proven Traktakat hull design. Both vessels are equipped with dispersant spraying systems, and both are powered by twin Cummins 6BTA5.9M1 marine diesel engines developing 250 bhp at 2,600 rpm. The transmission units are Twin Disc MG5050A gearboxes driving Teignbridge four-bladed AquaQuad 87 propellers.

The craft have been constructed to American Bureau of Shipping classification and are produced along with equipment as a "total package" jointly developed by MBM and Ro-Clean International AS.

For more information on MBM
Circle 102 on Reader Service Card

First Northern Offers High-Efficiency Absorbent

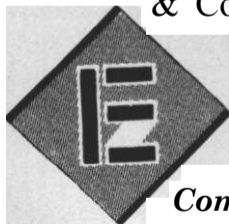
First Northern Environmental Inc. (FNE) provides Safe Harbor™ to the maritime industry, a new capillary absorbent designed to absorb all hydrocarbons, petroleum-based liquids and most water-soluble fluids. Its capillary/cell structure is designed to enable it to mechanically absorb and retain target liquids in microscopic cells. The product reportedly absorbs up to 60 times its own weight, ultimately helping to lower cleanup costs. Safe Harbor is also available in various configurations and spill kits for on-deck, bunkering, below-deck maintenance and terminal operations.

For more information on First Northern
Circle 128 on Reader Service Card

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Annual Certification Of Alaska Advisory Group

On June 24, 1994 the USCG published a notice to inform the public that the alternative voluntary advisory group for Cook Inlet, Alaska has been recertified (59 FR 32745). This certification was effective June 1, 1994 and terminates May 31, 1995.

Certification allows the advisory group to monitor activities of oil tankers and facilities. The voluntary advisory group represents the communities and interests near the oil terminal facilities in the Cook Inlet.

On April 19, 1994, the USCG announced the availability of its application for recertification that it received from the Cook Inlet Regional Citizen's Advisory Council (CIRCAC) and requested comments (59 FR 18592). No dissenting comments were received. The application from CIRCAC was evaluated in accordance with the policy statement published on July 7, 1993 (59 FR 36505).

By letter dated June 1, 1994, the Chief, Office of Marine Safety, Security and Environmental Protection certified that CIRCAC qualifies as an alternative voluntary advisory group.

Maritime Reporter/Engineering News

MarAd NEWS

MarAd Gives Go-Ahead To Extend *Cherry Valley's* Subsidizable Life

The MarAd and Maritime Subsidy Board have agreed to a request from Margate Shipping Co. to extend the subsidizable life of the 38,000-dwt tanker *Cherry Valley* until February 28, 1997. Without action, the subsidizable life would have expired July 9. The vessel was built by National Steel and Shipbuilding Co. (NASSCO) of San Diego, and delivered to Margate on July 10, 1974.

In its application, Margate said it requested the extension, under section 605 of the Merchant Marine Act, when the operating differential subsidy (ODS) expires on Chestnut Shipping Co.'s contract, which would then make the *Cherry Valley* eligible to receive subsidy sharing up to that time. Under the subsidy sharing arrangement, the vessel shares subsidy with vessels under Chestnut's contract and Margate's other contracts.

In addition, Margate indicated that the subsidy sharing received by the *Cherry Valley* would not increase the dollar amount of the present subsidy contracts, as no additional subsidy money would be required.

Section 605(b) states that ODS shall not be payable for tankers over 20 years old "...unless the Secretary of Transportation finds that it is in the public interest to grant such financial aid for the operation of such vessels and enters a formal order thereon."

MarAd OKs Vulcan Stock Sale

MarAd and Maritime Subsidy Board have approved an application filed by Vulcan Carriers, Ltd., for the sale of some of its stock to Captain Enrico Fenzi under its operating-differential subsidy agreement. A notice of the application, assigned Docket S-909, was published in the *Federal Register* on July 18. No comments on the application were received.

MarAd Seeks Scrapping Bids

MarAd issued Invitation for Bids EXC-8632 offering three obsolete vessels for scrapping within the U.S. or approved foreign countries. The ships are located in Singapore.

The vessels are:

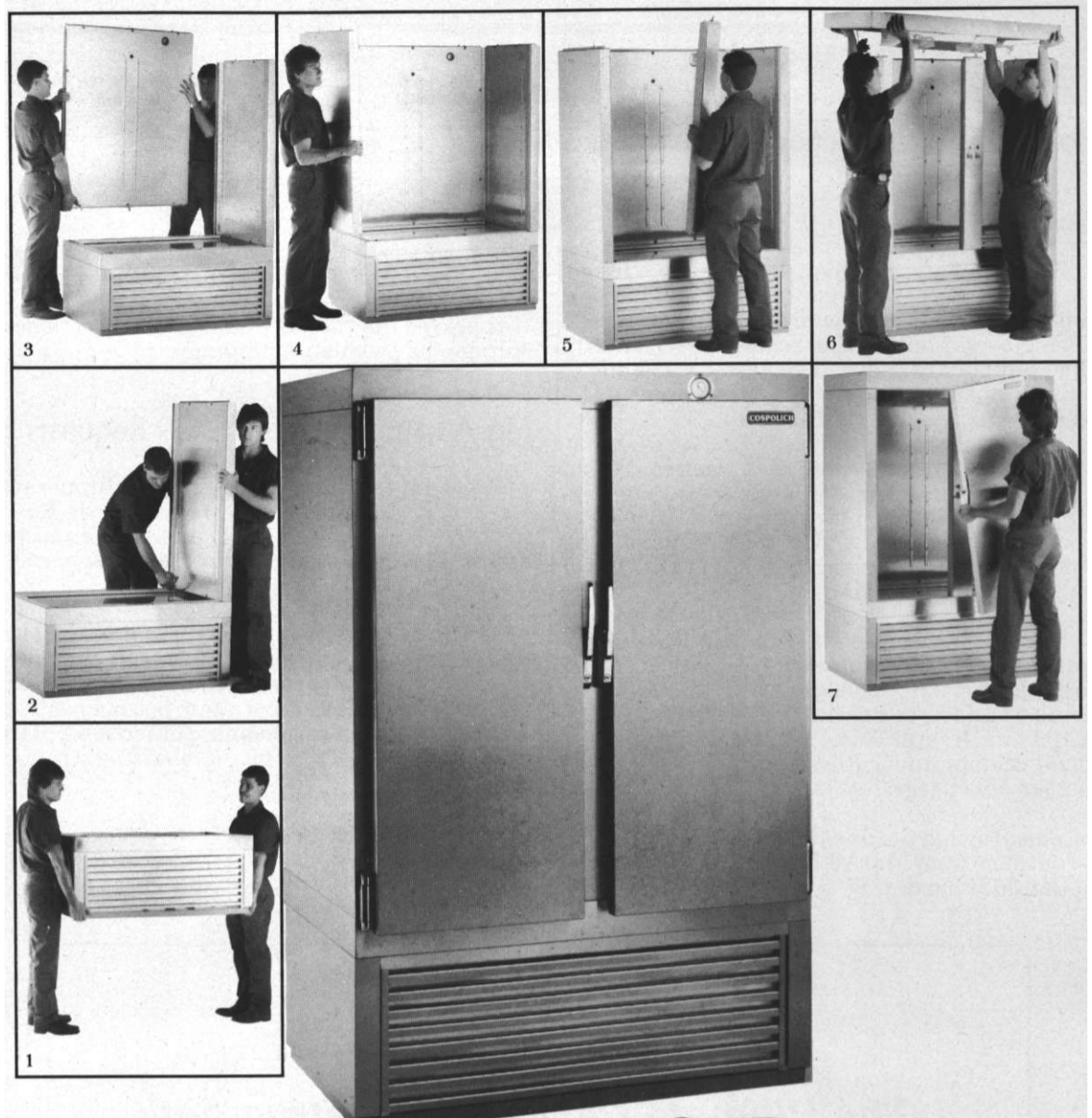
Vessel	Type
<i>Koalsch</i> (FF-1048)	Frigate
<i>Brumby</i> (FFG-1044)	Frigate
<i>Hector</i> (AR-7)	Tender

The ships are being sold on an "as is, where is" basis.

Public opening will be at that time at the offices of the MarAd, 400 - 7th St., SW, Washington, DC, in Conference Room 4342.

The obsolete vessels may be inspected Monday through Friday between 8:00 a.m. and 3:30 p.m. local time. Arrangements may be made by contacting:

CDR Steve Jurey (USN), or Larry Agee
Commander Logistics Group Western Pacific
PSA Sembawang Terminal,
Deptford Rd., Building 7-4
Singapore 2775
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Circle 227 on Reader Service Card

MarAd NEWS

MarAd Receives Section 9 Applications

MarAd has received several section 9 applications. They include:

- Neptune International, Inc., Grove Village, 111, has asked permission to sell the 39,700-gt tanker *Montrachet*. The proposed purchaser is Neter Navigation, S.A., for resale to M/S Kwalita Steel Supplier of India. The vessel was built in 1959 in Sparrows Point, Md. If approved, the vessel would be scrapped in India.

- All Alaskan Seafoods, Inc., Seattle, Wash., requested permission to transfer to Russian registry the 3,145-gt fish processor *Northern Alaskan*. The vessel, built in 1944 in Tampa, Fla., would be used for fish processing in the Sea of Okhotsk and the Bering Sea.

- Amrus International Co., Battle Ground, Wash., requested permission to sell the 1,427-gt cargo *Barge 23*. The proposed purchaser is Greus Co., Ltd., of Russia. The vessel was built in 1949 in Decatur, Ala. If approved, the barge would remain under Russian-registry and used as a surplus barge.

- Cenac Towing Co., Inc., Houma, La., has asked permission from MarAd to sell the tank barges *CTCO 3022*, and *CTCO 3023*. The proposed

purchaser is Cavalier Shipping, Inc., Panama City, Panama. The 1,503-gt barges were built in 1970 in Paducah, Ky. If approved, the barges would be used in transporting gas and oil between Argentina and Paraguay.

- OPI International, Inc., Newport News, Va., requested permission to transfer to Vanuatu registry the 39,028-dwt tank vessel *M/V Jamestown*, and the 45,652-dwt tank barge *Sa/ita Ynez*.

If approved the vessels would be used in offshore storage for petroleum products.

MarAd Approves Section 9 Requests

- Penrod International Drilling Co., Broussard, La., received approval to sell the drill rig *Ensco 67* to P & P Drilling Limited, a Bahamian corporation, and to transfer the vessel to Bahamian registry.

- Corostel Trading Ltd., a Canadian corporation, was given permission to resell the cargo vessel *Robert C. Norton* to Chenco International, Inc., a Washington corporation, but not a citizen of the U.S. within the meaning of section 2 of the Shipping Act of 1916. The vessel will be scrapped in China.

- Neptune International, Elk Grove, 111, received approval to sell the *Texas Trader* to Neter Navigation S.A., a Singaporean corporation, for

resale to M/S Lalchand Jain & Sons, an Indian corporation, for scrapping in India.

- Santa Fe (U.S. Holdings) Inc., Dallas, Texas, received permission to sell and transfer to Panamanian registry the jack-up rigs *Galveston Key* and *Key Manhattan*. The new owner is to be Santa Fe Drilling Operations, a Cayman Islands corporation.

- Western Atlas International, Inc., Houston, Texas, was given approval to transfer to Russian registry the supply vessel *Northern Lighter*, without change in the U.S. ownership of the vessel.

- Marine Resources Company International, Seattle, Wash., has received permission to sell and transfer to Russian registry the fishing vessel *Raven*. The purchaser is Joint Venture "Holkam," a Russian corporation.

- Sea Producer, Inc., Kodiak, Alaska, has received permission to transfer to Russian registry the fishing vessel *Sea Producer*, without change in the vessel's U.S. ownership.

- Shelikof Maritime, Inc., Kodiak, Alaska, received approval to transfer to Russian registry the fishing vessel *Shelikof*, without change in the U.S. ownership of the vessel.

Great Lakes Ports May Handle Preference Cargoes Under Program

Great Lakes ports now have a better opportunity to compete for government-generated agricultural commodity cargoes, MarAd's **Albert J. Herberger** announced today. "Our new trial program will help Great Lakes ports compete for additional cargoes they would not otherwise be eligible to receive," Adm. **Herberger** said. "This is good for the region, and good for the country." For both economic and defense reasons, cargo preference laws help maintain U.S.-flag merchant shipping by requiring the use of U.S.-flag vessels for a portion of the cargoes generated by the government.

Great Lakes ports have not been able to handle preference cargoes because there currently are no U.S.-flag shipping services out of the Lakes to overseas destinations, Adm. **Herberger** said.

During the ongoing shipping season, MarAd will allow agricultural commodity preference cargoes to be loaded initially on foreign-flag vessels at U.S. Great Lakes ports for the trip along the St. Lawrence Seaway. The cargoes will then be transferred to U.S.-flag ships for the ocean portion of the trip to foreign destinations.

MarAd is implementing the trial period by publishing amendments in the *Federal Register* to its cargo preference regulations. The trial period will remain in effect this year for as long as the St. Lawrence Seaway System is open.

MarAd Expands Electronic Bulletin Board

MarAd has expanded its computerized bulletin board to include "MarAd Advisories" and "Special Warnings to Mariners."

This new section includes "MarAd Advisories In Effect" and "Special Warnings In Effect" issued to mariners from the MarAd's Office of Ship Operations and the U.S. State Department's Office of Maritime and Land Transport.

MarAd Advisories rapidly disseminate information on maritime danger, safety and government policy and other timely matters pertaining to U.S.-flag vessel operations. They are issued by the Office of Ship Operations to vessel masters, operators and other U.S. maritime interests via telex message. Special Warnings to mariners are issued by the U.S. State

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Department's Office of Maritime and Land Transport. These warnings are the U.S. government's principal means of informing U.S. seafarers of official U.S. and foreign government proclamations affecting shipping, as well as political information relevant to ship operations.

They are transmitted to mariners through the DMA's world-wide Navigational Information Network. MarAd Advisories and Special Warnings to Mariners are published in the Defense Mapping Agency's Notice to Mariners.

MarAd's electronic bulletin board, called MARlinespike, is accessible by telephone from computers with modems. Information can be read online or downloaded for future reference.

The telephone number is (202) 366-8505. (Modem setting: 8 bits, no parity, 1 stop bit [8n1].) It also can be accessed via the Fed World Gateway (#72).

Additional information on how to access or use the service is available by calling (800) 9US-FLAG.

MarAd, NOAA, IRS Determine Interest Rate

MarAd, National Oceanic and Atmospheric Administration (NOAA) and the Internal Revenue Service (IRS) have determined that 5.62 percent is the applicable rate of interest on the amount of additional tax attributable to any nonqualified withdrawals from a Capital Construction Fund established under section 607(h) of the Merchant Marine Act of 1936, as amended, in the taxable year beginning 1994.

Research Report — Shipboard Piloting Expert System — Now Available

MarAd completed a research project with Rensselaer Polytechnic Institute of Troy, N.Y., to develop, design and evaluate an expert system for use as a decision support tool for shipboard pilots and navigation officers. The effort was jointly funded with the U.S. Coast Guard, while cost sharing was contributed by Exxon Shipping Co., Sperry Marine and the National Oceanic and Atmospheric Administration.

The project consists of three phases.

In Phase I, the initial Shipboard Piloting Expert System (SPES) was designed, developed and documented. This version of SPES was a "stand-alone" system which operated on a Sun workstation computer.

In Phase II, the SPES prototype software was validated and verified, and efforts were conducted to integrate the stand-alone software into the software which runs the SperryExxon-developed integrated bridge system, which was later installed aboard the *Exxon*

Benecia.

In Phase III, the software installed aboard the *Exxon Benecia* underwent debugging and was modified to satisfy comments received from the master of the vessel and pilots aboard the vessel.

It then was evaluated aboard ship during a 12-month period and a final report was prepared.

Further testing aboard the *Benecia* is currently underway in order to obtain additional insight

into the incremental benefits which can be expected from the use of an expert decision support system.

The report may be obtained from the National Technical Information Service, 285 Port Royal Rd., Springfield, Va. 22161; (703) 487-4650.

The order numbers and prices are as follow: Vol. I—Shipboard Piloting Expert System Final Report—PB94-183837, \$19.50; Vol. II—PB94-183274, \$27; Vol. III—PB94-187010, \$27.

SS Jeremiah O'Brien Stops In Baltimore

The *SS Jeremiah O'Brien*, a World War II Liberty Ship which took part in the June 6, 1944, invasion of Normandy, France was anchored at the Inner Harbor in Baltimore, Md. from August 18 to August 22. The vessel is on its return voyage from Europe where it participated in the 50th anniversary

(Continued on page 96)

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Circle 249 on Reader Service Card

NRC's Vikoma-Built Skimmer Proves Valuable In Oil Spill Cleanup

The *Cascade* oil skimmer, built for the National Response Corp. (NRC) by U.K. manufacturer Vikoma, reportedly proved its capabilities in the clean-up operations following the tank barge *Morris J. Berman's* spill off the Northern Puerto Rican coast in January. The vessel broke its towline and ran aground, gushing approximately 750,000 gallons of oil and fouling several miles of San Juan's prime tourist beaches.

Winds forced the oil into lagoons and shallow protected waters where it concentrated at thicknesses of up to six in. "This was the ideal proving ground for skimmer performance and reliability," according to **Bob Governale**, NRC's national equipment manager. "In the weir skimmer category, the *Cascade's* performance exceeded our expectations. It rated high marks for reliability and long term performance in the sorbent-choked, high viscous oil."

The *Cascade* was co-developed by NRC and Vikoma early in 1994. NRC wanted a weir skimmer that could perform with a high oil/low water recovery. During the period that the *Cascade* was deployed, it worked for six days around the clock. Twenty-three 5,000-gallon tank trucks were continuously rotated to collect the material recovered. Sorbents and debris reportedly passed through the skimmer's positive displacement pump without a problem.

NRC's Director of Logistics **John Ives** said, "With its unique folding arms, it's a very efficient load — whether by road or air lift."

For more information on Vikoma
Circle 9 on Reader Service Card



The Cascade oil skimmer proved its worth at a spill in Puerto Rico.

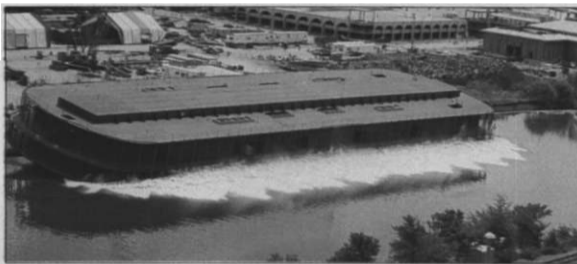
Norwegian Rescue Boats: From The Sky To Alaska's Tidewater Pacific



Five rescue craft were shipped by air from Europe to the U.S. to satisfy the delivery terms of Alaska's Tidewater Pacific, Inc. The craft will be used for transport of personnel to and from offshore oil barges. The boat will also be available for all types of rescue and oil spill operations.

Tidewater Pacific and S.E.R.V.S. of Alaska conducted thorough evaluations before selecting the Magnum 750 model from the Norwegian company. Crew and personnel safety were major factors in selecting the craft.

Bender Subsidiary Launches M/V *Grand Victoria*



Watch City Shipyard, Inc., Elgin, Ill., a subsidiary of Bender Shipbuilding & Repair Co., launched the 400-ft. (122-m) by 114-ft. (35-m) riverboat casino MV *Grand Victoria*, reportedly the nation's largest riverboat casino. The vessel was designed by Guido Perla & Assoc. Inc. of Seattle to replicate a 19th Century Victorian-style Illinois sidewheel riverboat. The *Grand Victoria* was launched into the Fox River, which was dredged to 9 ft. (3 m) to accommodate the boat.

The vessel is owned by Elgin Riverboat Resort, a joint venture between Hyatt Development Corp. and Nevada Landing Hotel & Casino.

Faced with the challenge of building a massive riverboat for a landlocked area, Bender Shipbuilding opened Watch City Shipyard for the express purpose of building the *Grand Victoria* on site.

Once completed, the Victorian-style *Grand Victoria* will have approximately 50,000-sq.-ft. of casino area and 1,200 gaming positions including blackjack tables, slots, crap tables and roulette wheels.

Bender Completes Riverboat To Operate In Bossier City, La.



Bender Shipbuilding & Repair Co., Inc. has completed the *Queen of the Red*, a 295-ft. (90-m) casino riverboat built for Horseshoe Entertainment.

The riverboat is now operating on the Red River in Bossier City, La., near Shreveport.

The *Queen of the Red* is the seventh casino vessel completed by Bender. The shipyard currently has seven other casino vessels under construction.

Built in the style of a 19th Century paddlewheeler, the *Queen of the Red* can accommodate 2,200 passengers.

With 30,000-sq.-ft. of gaming space, the boat is reportedly the largest casino operating in the Shreveport area.

Built using modular construction methods at Bender's Mobile facilities, the *Queen of the Red* was towed to Bossier City for final outfitting. To allow for clearance under bridges along the route, the top deck was towed separately to Bossier City and installed and finished out on site.

The riverboat has a 78-ft. (24-m) wide beam and is propelled by a paddlewheel and two stern thrusters.

For more information on Bender
Circle 12 on Reader Service Card

Union Naval de Levante Launches Advanced-Technology Asphalt Carrier



The shipyard Union Naval de Levante launched the *Mar Almudena* at its factory in Valencia, Spain. This ship is an advanced-technology asphalt carrier, built on order by WW Marpetrol to

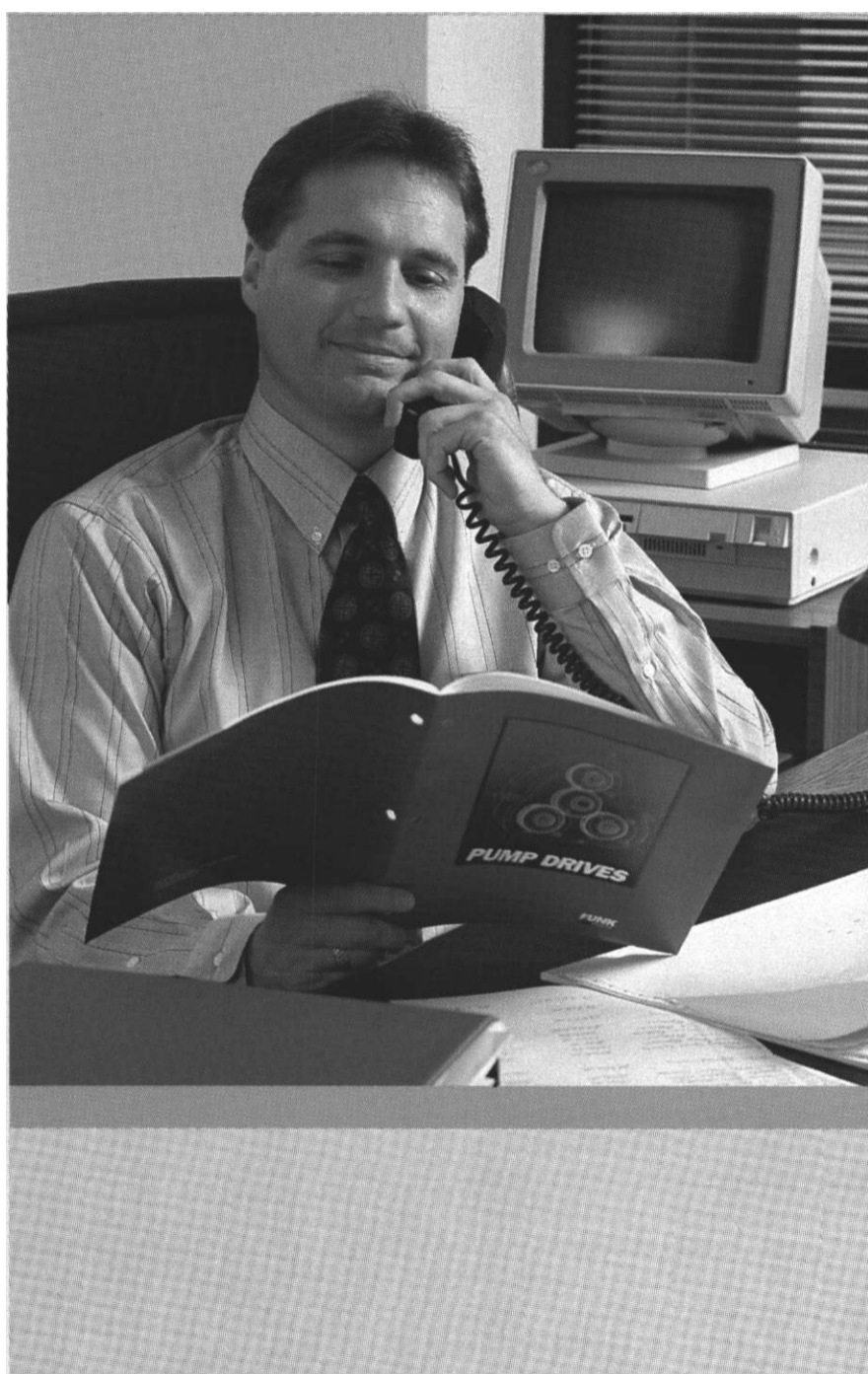
be operated by CEPSA, one of Spain's privately-owned oil companies. The *Mar Almudena* utilizes a highly refined structural design, solving the problem of transporting liquid asphalt heated to 170 degrees F (a process which produces extreme thermal stresses in the tank structure). By means of three-dimensional analysis by finite elements (3D FEA), thermal fatigue has been reduced to the minimum, which eliminates the danger of plate cracking, a frequent occurrence in this type of vessel after a relatively short period of service.

The *Mar Almudena* is built with a double hull, in compliance with Marpol and U.S. Coast Guard standards, with six central cargo tanks and ballast tanks at sides and in double bottom. The ship is equipped to handle two cargo segregations. *Mar Almudena* is 397 ft. (121 m) long, with a beam of 61 ft. (18.5 m) and draft of 23 ft. (7 m).

For more information on Union Naval de Levante
Circle 54 on Reader Service Card

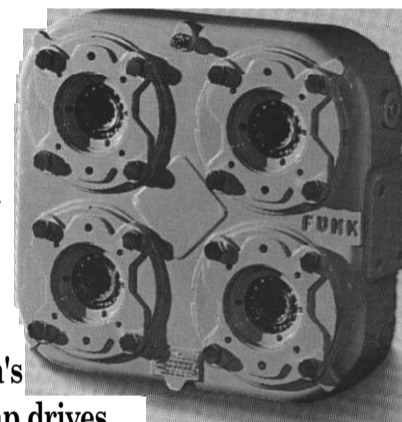
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MarAd NEWS

(Continued from page 93)

celebration of D-Day. President Clinton's June visit to the vessel at Normandy was the first time a U.S. president boarded a U.S. merchant vessel.

The *O'Brien* is crewed by World War II merchant marine veterans. Its return to Normandy was a gesture of remembrance to their fellow mariners lost in that war. A total of 733 American cargo ships and more than 6,000 civilian American seafarers' lives were lost to enemy action during World War II.

Thousands were injured during attacks, and many were forced to wait aboard lifeboats and rafts, hoping for rescue after their vessels were lost.

Nearly 600 merchant mariners were held as prisoners of war.

The *Jeremiah O'Brien* made 11 round trips from Britain to the

Normandy beachheads in 1944. She was one of 2,751 Liberty Ships built by 18 American shipyards between 1941 and 1945, crewed by American civilian seafarers and defended by the Navy Armed Guard. Speaking in London in 1944, Gen. Dwight D. Eisenhower said:

"Every man in this Allied command is quick to express his admiration for the loyalty, courage, and fortitude of the officers and men of the Merchant Marine. We count upon their efficiency and their utter devotion to duty as we do our own; they have never failed us yet and in all the struggles yet to come we know that they will never be deterred by any danger, hardship, or privation.

"When final victory is ours there is no organization that will share its credit more deservedly than the Merchant Marine."

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Andy Richardson -	Mobil Shipping
Sergio Mello -	Bureau Veritas
Roger Burnison -	Santander
A M van Wijngaarden -	Allseas Engineering
Kjell Olaisen -	Det norske Veritas
Trevor Owen-Thomas -	Seahorse Ship Mgmt
Tan Mong Seng -	Sembawang Shipyard
James Bell -	IACS
Magnus Ringner -	Gotaverken Cityvarvet
Spiro Aquilina -	Malta Drydocks
Tony Reading -	TRS
Wolf Leifeld -	Hammelmann
Hans-Michael Meissner -	Blohm+Voss
TBA -	Intertanko
Brian Smith -	P&O Bulk Shipping
George Cornmell -	Mell Maritime Mgmt

Conference Key Issues

- Future Markets - which shipping markets are likely to provide increased work for shiprepairers?
- Conversions - specialist tanker to FPSU projects
- The "Solitaire" conversion
- Developments - Maintenance-free VLCCs
- Repairing in mainland China
- Question Time - on the subject of Surveys and Sub-standard ships
- Extras Debate - Additional costs but how much is reasonable?
- Disaster Management - How should a yard deal with it?
- Hydroblasting - a viable alternative?
- Spare Parts & Maintenance
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MarAd OKs APL Section 804(a) Waiver Request

MarAd has agreed to a request filed by American President Lines (APL) for a section 804(a) waiver of the Merchant Marine Act, 1936, as amended, to permit APL to use space on vessels operated by Transportation Maritima Mexicana, S.A. de C.V. (TMM) for transpacific carriage of cargoes in U.S. foreign trade.

The application was assigned Docket S-907, and published in the *Federal Register* on June 23, 1994.

MarAd determined that there would be no adverse competitive impact on U.S.-flag operators as a result of the waiver.

The agency also noted that APL has entered into a slot charter agreement with TMM in foreign-to-foreign trade between Asia and Mexico, and APL would use space on the TMM vessels to accommodate overflow cargoes, to carry these cargoes between foreign and U.S. ports.

Section 804 precludes subsidized U.S.-flag operators or related companies or persons from operating foreign-flag vessels which compete with essential U.S.-flag shipping services unless the Secretary of Transportation waives the provisions of this section for a specific period of time. The agency found that allowing APL to utilize a portion of its space on the TMM vessels for the carriage of U.S. foreign trade cargoes, in addition to foreign-to-foreign cargoes, would benefit APL's shipping customers. In addition, MarAd noted that comments and/or objections to the grant of APL's application were filed by the Seafarers' International Union of North America, Pacific District on behalf of the members of the Marine Firemen's Union, Sailors' Union of the Pacific, and Seafarers' International Union AGLIWD.

After review of the comments, MarAd found that the unions raised no persuasive reason within the scope of section 804 to deny APL's application.

MarAd Issues Order Regarding Seabulk America

On August 15, 1994, the Maritime Administrator and Maritime Subsidy Board issued an opinion and order in Docket No. A-184, addressing the remand of the U. S. District Court in *Keystone Shipping Co. v. United States*, 801 F. Supp. 771 (D.D.C. 1992). The court had remanded for a fuller explanation, both MarAd and U.S. Coast Guard (USCG) determinations which allowed the chemical carrier, *Seabulk America*, to operate in domestic trade. The vessel was constructed by joining the stern of the *FUJI*, a wrecked foreign-built vessel, with the forebody of *Barge 4102*, a U.S.-built vessel constructed and acquired, respectively, with the aid of construction-differential subsidy (CDS) and the capital construction fund (CCF).

On June 14, 1994, the USCG reaffirmed its previous determination that the *Seabulk America* is

eligible, under the Wrecked Vessel Act operation in domestic trade, so far as the Jones Act (section 27 of the Shipping Act of 1920) is concerned. By the opinion and order issued in Docket No. A-184, MarAd reaffirmed its previous determination and concluded that once the *Barge 4102* was cut up, it no longer was a vessel subject to CDS and CCF trading restrictions; such determination is in accord with relevant MarAd precedent; introduction of the *Seabulk America* into the domestic trade did not have an undue adverse competitive impact on domestic operators, and introduction of the *Seabulk America*, into the domestic trade furthers the purposes and policy of the Merchant Marine Act, 1936, as amended. MarAd announces the establishment of the Voluntary Intermodal Sealift Agreement (VISA), pursuant to section 708 of the Defense Production Act of 1950,

as amended (50 U.S.C. App. 2158). The purpose of the agreement is to promote and facilitate the use of intermodal transportation systems, including ships, ships' space, intermodal equipment and related management services, and to maximize the Department of Defense's use of commercial transportation resources to support the emergency deployment and sustainment of U.S. military forces through cooperation among the maritime industry, the Department of Transportation and the Department of Defense. Copies of the VISA are available to the public upon request from MarAd's Office of National Security Plans. For further information contact: **Thomas M.P. Christensen**, Director, Office of National Security Plans, MarAd, 400 - Seventh St., SW, Washington, DC 20590, tel: (202) 366-5900 or fax: (202) 488-0941.

USCG, National Cargo Bureau Sign Safety Agreement

The U.S. Coast Guard (USCG) signed a memorandum of understanding (MOU) with the National Cargo Bureau (NCB) promoting maritime safety. The agreement formalizes mutual responsibilities between the two organizations that govern the safe carriage and stowage of hazardous materials on board commercial vessels. The MOU reflects the Department of Transportation's goal to establish working partnerships for ensuring the safe and secure intermodal transportation of hazardous materials within U.S. waters. Both the NCB and the USCG noted at the signing, which took place at USCG Headquarters in Washington, D.C., that the agreement complements their continued efforts to improve overall maritime safety within the U.S. by ensuring the efficient use of inspectors and facilities.

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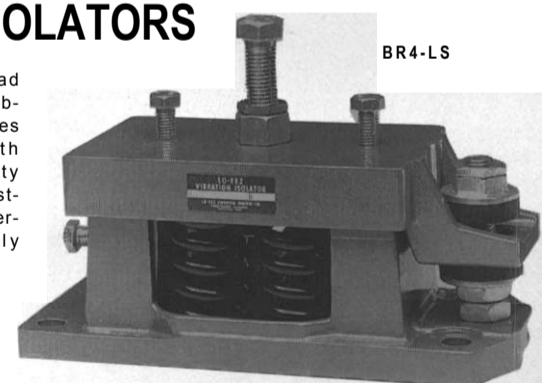
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THE WORLD ORDERBOOK

For the quarter ended June 30, 1994, there were 1,098 steamships and motorships with a gross tonnage (gt) of 15,844,647 under construction in the world. This figure is 149,823 gt more than last quarter. There are 1,050 ships on order which have not been commenced for a combined total of 24,997,199, a figure which is 1,621,252 gt more than last quarter. The tonnage volume in the world orderbook increased to 40,841,846 gt (an increase of 1,771,075). More than 79 percent of the ships on the world orderbook are scheduled for delivery by the end of 1995. New orders

during the quarter came to 6.7 million gt, more than 2.1 million gt more than the total output during the quarter.

During this quarter, 205 ships (total of 3,981,237 gt) were commenced; 264 ships (total of 4,082,029 gt) were launched; and 313 ships (total of 4,610,632 gt) were completed. Decreases were recorded for all three stages of progress, when compared with the previous quarter. The shipbuilding countries making the largest contribution to the tonnage in the world orderbook (see chart) are Japan, with 11,238,765 gt (of which 85

percent was exported); Korea (South), with 9,412,968 (of which 93 percent was exported); the People's Republic of China—including Republic of China (Taiwan)—with 1,468,142 (of which 51.5 percent was exported); Poland, with 1,239,545 (of which 99 percent was exported); Germany, with 1,096,662 (of which 67 percent was exported); and Romania, with 1,050,867 (of which 76 percent was exported). Countries making the largest additions to their existing fleets are Panama, Liberia, Japan, Norway, Greece, and the People's Republic of China.

Tankers represent 32 percent of the total world orderbook, while bulk carriers represent 34 percent and general cargo 18 percent (container tonnage constitutes 71 percent of the general cargo total orderbook). Liquefied gas carriers account for 2.8 million gt of the total orderbook. Japan is the country making the largest contribution in this area, with 47.5 percent of the tonnage and 48 percent of total capacity. Of miscellaneous ships ordered, passenger vessels account for 42 percent of the total and ferries represent 17.5 percent.

All Ships in the World Orderbook at the End of the Second Quarter, 1994

WHERE BUILDING	UNDER CONSTRUCTION		NOT COMMENCED		TOTAL		Percentage of World Tonnage	DWT
	No.	Gross Tonnage	No.	Gross Tonnage	No.	Gross Tonnage		
Argentina	12	44,577	3	330	15	44,907	0.11	58,530
Australia	23	21,625	8	2,220	31	23,845	0.06	3,042
Belgium	10	30,190	6	113,415	16	143,605	0.35	238,340
Brazil	29	558,598	15	387,940	44	946,538	2.32	1,356,647
Bulgaria	16	133,589	2	18,241	18	151,830	0.37	220,813
Canada	1	250	2	4,000	3	4,250	0.01	2,225
Chile	2	1,131	5	2,700	7	3,831	0.01	3,608
'China, People's Republic Of	42	576,616	69	1,379,825	111	1,956,441	4.79	3,329,222
China, Republic of (Taiwan)	12	464,806	18	428,750	30	893,556	2.19	1,450,129
Croatia	16	475,833	8	330,200	24	806,033	1.97	1,196,904
Denmark	13	355,356	32	1,107,401	45	1,462,757	3.58	2,556,115
Egypt	12	28,835	9	12,280	21	41,115	0.10	52,210
Fiji	1	3,125	—	—	1	3,125	0.01	450
Finland	9	464,934	8	367,240	17	832,174	2.04	341,980
France	10	388,265	8	323,700	18	711,965	1.74	333,105
"Georgia	—	—	1	344	1	344	0.00	35
Germany	59	673,111	52	969,250	111	1,642,361	4.02	1,643,029
Greece	7	16,770	1	5,000	8	21,770	0.05	15,150
Hong Kong	1	202	—	—	1	202	0.00	100
India	48	95,378	7	35,960	55	131,338	0.32	153,109
Indonesia	9	27,750	4	33,906	13	61,656	0.15	76,100
Iran	10	8,579	4	3,867	14	12,446	0.03	11,437
Italy	42	739,892	18	480,000	60	1,219,892	2.99	1,036,584
Japan	203	4,810,456	242	8,472,168	445	13,282,624	32.52	19,813,940
Korea (North)	—	—	1	9,626	1	9,626	0.02	8,000
Korea (South)	63	3,220,022	138	6,940,023	201	10,160,045	24.88	16,574,073
Malaysia	10	27,790	1	5,000	11	32,790	0.08	53,480
Malta	6	14,995	—	—	6	14,995	0.04	18,140
Mexico	3	8,189	—	—	3	8,189	0.02	10,680
The Netherlands	67	152,843	28	71,629	95	224,472	0.55	241,935
Norway	22	87,639	26	224,025	48	311,664	0.76	335,298
Pakistan	1	8,200	3	9,900	4	18,100	0.04	21,100
Peru	25	13,332	4	1,420	29	14,752	0.04	7,430
Philippines	1	546	—	—	1	546	0.00	720
Poland	41	539,353	43	716,547	84	1,255,900	3.08	1,621,818
Portugal	23	12,381	6	10,574	29	22,955	0.06	28,031
Romania	73	955,976	18	424,654	91	1,380,630	3.38	2,277,651
'Russia	20	134,722	115	532,872	135	667,594	1.63	861,460
Singapore	28	88,091	12	43,919	40	132,010	0.32	198,997
Slovakia	5	10,206	1	2,370	6	12,576	0.03	18,945
Spain	41	281,954	29	328,779	70	610,733	1.50	845,296
Sweden	1	128	2	47,400	3	47,528	0.12	30,650
Turkey	22	159,189	7	15,732	29	174,921	0.43	269,150
'Ukraine	2	25,549	28	609,096	30	634,645	1.55	884,165
United Kingdom	15	123,591	11	428,021	26	551,612	1.35	1,011,541
U.S.	33	22,083	42	48,275	75	70,358	0.17	83,093
Yugoslavia	9	38,000	13	48,600	22	86,600	0.21	117,450
WORLD TOTAL	1,098	15,844,647	1,050	24,997,199	2,148	40,841,846	100.00	59,411,907

* Information Incomplete

Source: Lloyd's Register

ISM, ISO Brochures Available From BV

Following the adoption of the International Safety Management (ISM) Code by the International Maritime Organization (IMO) and in response to its requirements, Bureau Veritas (BV) has developed a modular system for the upgrading and certification of shipping company and ship Safety Management Systems (SMS).

Although it is intended that the ISM Code will be made mandatory by IMO member governments from June 1, 1998, BV's current strategy is to promote the implementation of the ISM Code on a voluntary basis in order to accelerate improvement in the safety of maritime transport.

BV has available three new brochures: ISM Code Certification Scheme, Ten Steps for Implementing the ISM Code, and Ten Steps for Implementing ISO 9002.

To obtain copies of the brochures, contact Bureau Veritas, Ships in Service Management, Quality & Safety Division, 17 bis Place des Reflets, La Defense 2, 92400 Courbevoie, France, tel: +33 1 4291 5291; fax: +33 1 4291 5293.

Marco Designs New Class Of Combination Vessels

The first of a new class of combination vessels, the Marco 108-ft. (33-m) Special Oil Recovery Tug (SORT 33) was launched at Lien Ho Shipyards in Taiwan.

Designed by Marco for China Petroleum Corp., the vessel reportedly combines the characteristics of a tractor tug with an open ocean oil recovery vessel. The SORT's primary mission is to provide shiphandling assistance at oil terminals, onshore and off.

The SORT also has fire fighting capability with two four-in. monitors delivering up to 3,000 gallons of water per minute to a fully self-sufficient oil recovery system with a sweep width in excess of 60 ft. (18 m) and a recovery rate of up to 2,600 barrels per hour when using the two three-ft.-wide Filterbelts. The tug has recovered oil storage capacity of more than 600 barrels onboard.

As well as the design for the vessel, Marco provided the oil recovery equipment packages for this project and many of the vessel's auxiliary equipment packages (including generators, fire fighting systems, navigation electronics, keel coolers and liquid transfer systems).

For more information on Marco
Circle 65 on Reader Service Card

Hyundai Group To Buy Used Cruise Ships For Pleasure Boat Business

Two companies in the Hyundai Group, Hyundai Heavy Industries (HHI) and Hyundai Merchant Ma-

rine Co. (HMM), plan to start cruise ship tour businesses covering South East Asia, China and Russia.

Current Korean law prohibits import of used pleasure boats, including cruise ships, but that law might change by the end of this year.

If the law is amended, Hyundai will import used cruise ships from foreign countries or will supply cruise ships manufactured by HHI.

Port Of Los Angeles Sets New Container Record

Capping a 198 percent increase in container volume in the last 10 years, the Port of Los Angeles, in FY '94, handled 2,378,870 TEUs, surpassing its previous fiscal record of 2,311,463 TEUs established a year ago.

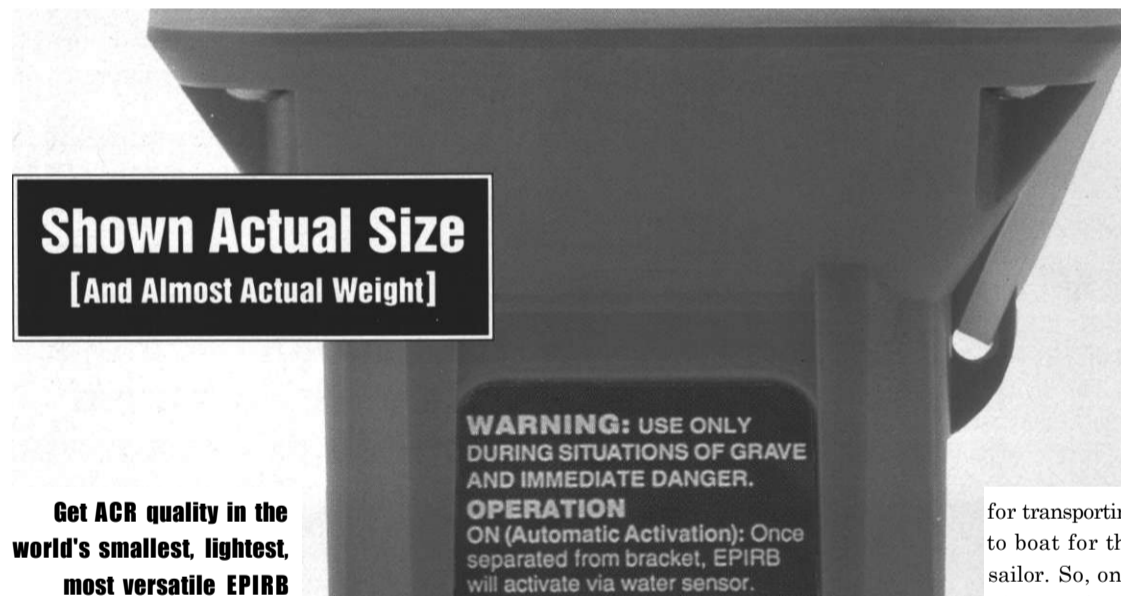
Al Fierstine, the port's director

of marketing, noted, "Fiscal 1994 is the fifth consecutive year that the Port of Los Angeles has passed the annual threshold of two million TEUs. The new container record dwarfs the fiscal 1984 count of 799,160 TEUs by 1,579,710 TEUs."

The port has opened four new marketing offices since July 1993. Two new offices in China and two in Vietnam give the port a total of 18 marketing offices outside the U.S.



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Circle 203 on Reader Service Card

Variable Draft SWATH DSV To Be Constructed

BSM Joint Venture of Houston, Texas announced the contract signing between its client, Global Industries, Ltd. of Lafayette, La. and Aker Gulf Marine of Ingleside, Texas, for construction of a variable draft SWATH Diving Support Vessel (DSV) designed by BSM Joint Venture. The vessel is 200 ft. (61m)

long and 87 ft. (26.5 m) wide.

Global plans to accept delivery of the SWATH DSV in 1995. The Global SWATH DSV is expected to operate in the Gulf of Mexico in support of offshore oil exploration and production projects. Special project opportunities for the Global SWATH DSV are also anticipated in the in-

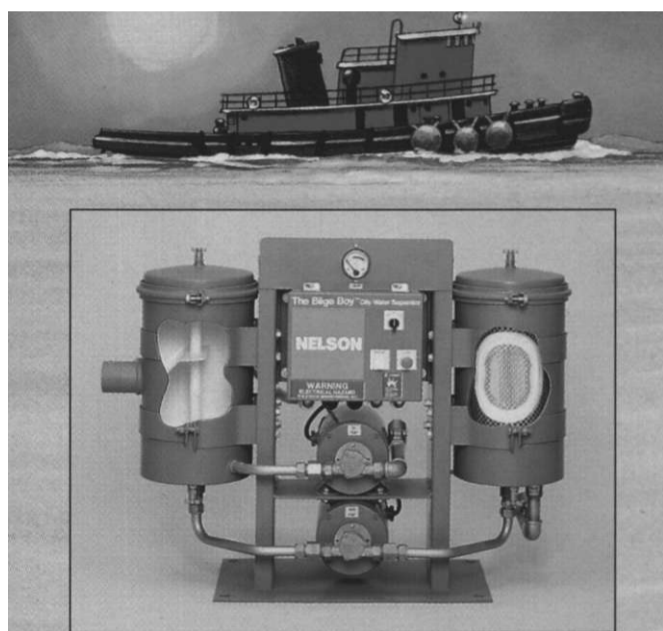
ternational arena.

Small Waterplane Area Twin Hull (SWATH) vessels consist of two submerged hulls, each surmounted by a pair of slender surface piercing vertical struts which are connected to the superstructure. The primary effect of the SWATH hull form is drastically-reduced motion response

in rough sea conditions. The BSM SWATH is designed to perform useful offshore operations in wave conditions as high as Sea State 6. It reportedly will safely and comfortably ride out storms of greater severity. These capabilities exceed virtually all conditions that can occur in the Gulf of Mexico and will enable unrestricted operations throughout the winter.

The variable draft feature of the BSM SWATH design provides a high degree of operating flexibility. The shallowest draft is well within usual harbor limits and gives the lower hulls a slight freeboard, allowing for maximum transit speeds in low to moderate sea conditions. At deeper drafts, the vessel provides for transit in heavy weather and for minimum vessel motion when holding station or underway. The vessel will have a diesel electric CP system with three 930-kW diesel engine generators in the upper hull and four 800-hp azimuthing thrusters in the pontoons. The vessel has two heavy lift cranes, a large stern A-frame and will accommodate 53 persons.

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Hollywood Opens Dockside Casino In Tunica, Miss.

Hollywood Casino Corp. successfully opened its new dockside casino in northern Tunica County, Miss. The facility, Hollywood Casino-Tunica, is located at Commerce Landing in the city of Robinsonville.

Hollywood Casino-Tunica offers a 54,000-sq.-ft. gaming area with more than 1,300 slot machines and 64 table games. This facility is reportedly the only single-level casino in the Commerce Landing cluster, as well as the largest single-level casino in the Tunica County market. **Jack E. Pratt**, chairman and CEO of Hollywood Casino Corp., said, "We are excited about our entry into the sizeable Tunica market. We look forward to bringing the Hollywood-style of gaming to the area, which has more than 4.1 million people within a 150-mile radius of Memphis."

Crowley Tug Rescues 132

The Crowley Marine Services tugboat *Pi. Milne*, the first vessel to the scene of a fire near Unimak Island aboard the fish processing factory ship *All Alaskan*, rescued 132 of the 133 crew members. One crew member is believed to have perished in the fire.

The *Pi. Milne*, skippered by Capt. **A1 Krininger**, was en route from Dutch Harbor to Briston Bay, towing a 240-ft. (73-m) Crowley Marine Services barge, when the mayday was broadcast. The *Pi. Milne* delivered the survivors to a second fish processing ship, *Independence*, which had arrived along with U.S. Coast Guard vessels to the scene.

YARD PROFILE

Norshipco:

Striving To Strike A Military & Commercial Balance

Norfolk Shipbuilding & Drydock Corporation (Norshipco) in Norfolk, Va., is a privately held corporation that has served the Port of Hampton Roads in the marine industry since 1915. Norshipco is a full-service shipyard, and has enjoyed a reputation as one of the largest repair facilities on the East Coast of the U.S.

At present, the workforce numbers approximately 2,000 people working in 23 diversified trade shops and departments.

The Main Yard At Berkley

Norshipco's Berkley Plant features the Titan — one of the world's largest and most modern floating steel drydocks. The Titan is 950 ft. (290 m) long, 192 ft. (59 m) wide and 160 ft. (49 m) between wingwalls, with a 54,250-ton lifting capacity. The Titan is moored to a 1,030-ft. (314-m) long concrete pier used to service and repair ships as long as 1,200 ft. (366 m). Two cranes service the Titan and the pier, one of which is a giant Kroll K-1800 Hammerhead jib trolley, with a stance of 250 ft. (76 m) in the air and a reach of 214 ft. (65 m). The Berkley Plant has eight full service piers and extensive crane service.

Complementing the Titan is the Virginian, a 20,000-ton lifting capacity drydock with wingwall cranes. The Virginian is an all-steel floating drydock that measures 670 ft. (134 m) long by 126 ft. (38.5 m) wide.

Brambledon

Norshipco's Brambledon Plant services medium-sized oceangoing vessels. The plant is complete with seven full-service piers, four 30-ton diesel cranes, a 2,500-ton floating steel drydock, Challenger, and two marine railways. The Challenger is 200 ft. (61 m) long and 70 ft. (21 m) wide, and was built at the Berkley Plant.

The Brambledon Plant performs

"downriver" work. Vessels in need of production work and not requiring entry into a repair facility, or vessels having limited time, can stay at their present location ("downriver") and shiprepair teams from the Brambledon Plant facility will travel to the vessel to perform the required work or services. In a sense, these shiprepair teams bring the shipyard to the ship.

Today: A Commercial & Military Mix

Norshipco drydocks an average of 80-plus vessels a year. This includes tandem drydockings of Navy combatants, and triple dockings of commercial vessels in the same drydock. Extensive hull painting and blasting, piping and machinery system repairs and modifications, as well as steel and structural repairs are performed on a routine basis. In 1993 Norshipco received 107 marine-related contracts: 72 commercial contracts and 35 for the U.S. government. Government awards included one contract for the Army, three for the National Oceanic and Atmospheric Administration (NOAA), six for the Maritime Administration (MarAd), 10 for the Navy, and 15 for the Military Sealift Command (MSC).

The U.S. government has been one of Norshipco's major customers for most of the life of the corporation, which was rated one of the Top 100 defense contractors for 1991 in terms of dollar value of Defense Department contracts awarded.

Norshipco's two steel floating drydocks at the Berkley Plant performed a total of 58 drydockings in 1993, 14 for U.S. government ships and 44 commercial ships.

Norshipco performed work on eight cruise ships during 1993, including the *Sovereign of the Seas*, *Festiva*, *Royal Princess*, *Regal Princess*, *Meridian*, *Nordic Empress*, *Regent Sun* and the *Rotterdam*. Notably, Norshipco



Norshipco's Berkley Plant is the hub of its operation, and home of the Titan, a 950-ft.-long floating steel drydock.

worked with Sea-Land Service, Inc. on an aggressive drydocking, repair and maintenance contract for six Atlantic class containerships. Each ship underwent a seven-day schedule of required drydocking, blasting and painting, sea-valve work, readings on tailshaft and rudder, tug reinforcement (involving internal structural back-up support) and regulatory body ballast tank inspections by ABS and the U.S. Coast Guard. Norshipco also worked on three smaller Lancer class vessels and the *Sea-Land Expedition* for Sea-Land, under separate contracts.

Contracts awarded to Norshipco performed to date for 1994 include both commercial and government contracts. By the end of the first quarter of 1994, the Berkley Plant had performed or was performing two Navy contracts, seven MSC and MarAd contracts, three cruise ship

contracts and 11 other commercial contracts. The second quarter produced one additional Navy contract, two MarAd contracts, one cruise ship and eight other commercial contracts. Third quarter awards have produced two Navy contracts, four MSC/MarAd contracts, two cruise ship contracts and seven more commercial contracts.

Major awards to Norshipco from the Navy slated for the fourth quarter include:

- USS *Simpson* FFG 56, for a Selected Restricted Availability (SRA), to be performed from June 27, 1994 through October 21, 1995.
- USS *Normandy* (CG 60), for a Drydocking Selected Restricted Availability (DSRA), from August 1, 1994 through November 3, 1995.
- Floating drydock *Resolute* (AFDM 10), for a Regular Overhaul (ROH),

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For certain jobs that do not require drydocking or for which there is limited time, the Brambleton Plant can dispatch repair teams to vessel locations.

from October 1, 1994 through March 10 1995

• USNS *Niagara Falls* (T-AFS 3), an MSC nationwide "Best Value Procurement" solicitation. Awarded to Norshipco with a 274-day availability to include voyage repairs, overhaul, habitability arrangement, addition of elevators, drydocking and repair and maintenance, to be performed from November 4, 1994

through August 4, 1995.

• The Phased Maintenance Program (PMP) for the LSD/LPD class vessels homeported in Norfolk. This PMP includes the vessels USS *Pensacola* (LSD 38), USS *Portland* (LSD 37) and the USS *Austin* (LPD 4). The award for the LSD/LPD includes nine availabilities for three ships. The PMP has a performance period from the first ship's availability of October 12, 1994 to the last ship's availability of November 6, 1998. The Phased Maintenance Program was also for AO-177 class vessels homeported in Norfolk. This includes USS *Monongahella* (AO 178), USS *Merrimack* (AO 179), and the USS *Platte* (AO 186). The three AO 177 class vessels are slated to undergo eleven availabilities during the life of the program. The PMP has a performance period between October 4, 1994 and December 3, 1999. The downsizing of the U.S. military has produced a shift towards an increase in commercial shiprepair and conversion markets. Norshipco also provides a number of specialized services through the fol-

lowing subsidiaries:

Diesel Marine Norshipco. A subsidiary developed to meet increasing demands for diesel service. Norshipco joined with Europe-based Diesel Marine International, which supplies, reconditions and exchanges diesel engine components. Diesel Marine Norshipco offers special parts exchange services that eliminate the lengthy, expensive wait for parts. Norshipco's multi-million-dollar investment in an autonomous machine shop, chrome-plating and reconditioning facility, combined with a full staff of European-trained diesel mechanics, offers customers state-of-the-art services at competitive U.S. prices.

Industrial Conversion & Repair Services. Norshipco is able to use its shipbuilding and repair capacities in diverse industrial repair and construction projects. The division specializes in industrial plant construction, repair and conversion. Services are available 24 hours a day, seven days a week, throughout the U.S.

With the drive to increase its

participation in the national and international markets, Norshipco is committed to meeting the challenges of the shiprepair market by providing high quality work, special component reconditioning and engineering services to a wide range of markets including international shipping, defense, power generation and the industrial market. To meet the needs of the domestic and international marketplace, Norshipco has increased its efforts toward the commercial shiprepair and conversion market. Norshipco prides itself on operating in a safe and environmentally responsible manner and in providing products and services that fully meet the customers' requirements economically and in a timely manner. Norshipco strives for total customer satisfaction and the elimination of quality deficiencies through the application of an effective Quality Management System based upon the requirements of the International Standards Organization (ISO 9002).

For more information on Norshipco
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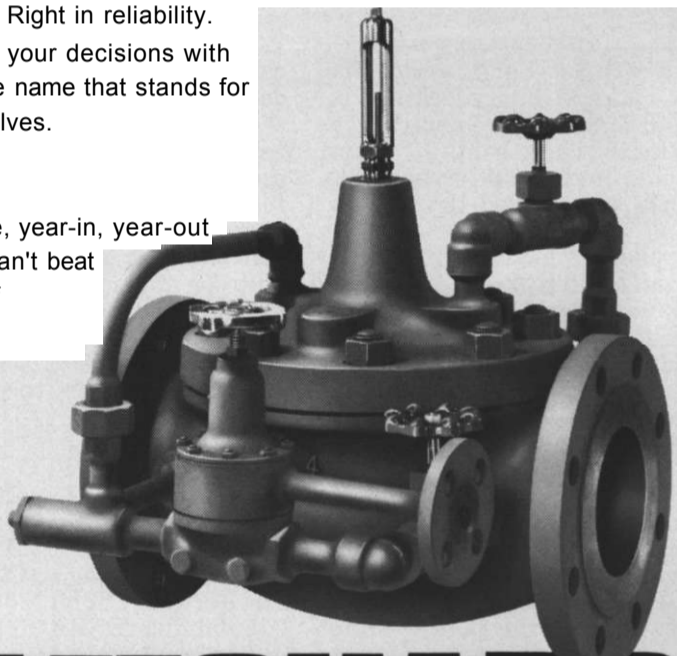
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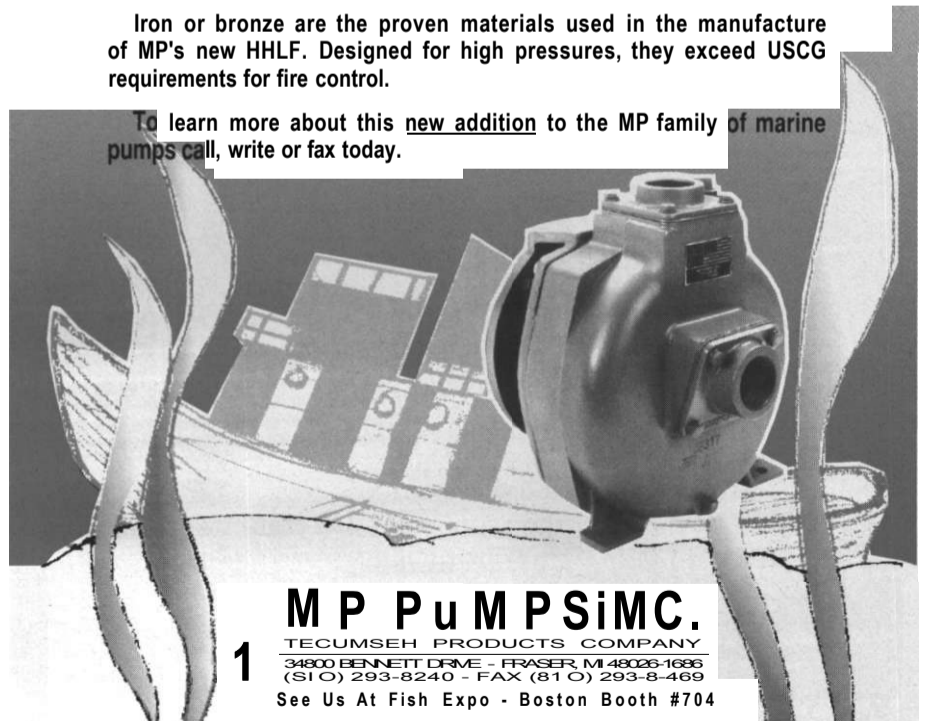
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CALENDAR

SEPTEMBER

Society of Petroleum Engineers (SPE) Forum Series in Europe: September 4-23, Seefeld, Austria

Gas Condensate Reservoirs - September 4-9
Management of the Drilling Process — What Next? - September 11-16
High-Temperature Completions - September 18-23

Contact: SPE, Office, 4 Mandeville PL, W1M 5LA, London, England, tel: +44 71 487 4250; fax: +44 71 487 4229.

Baltexpo '94: September 6-9, Gdansk, Poland
Contact: Agpol Promotion Ltd., ul. Sniadeckich 17, 00-654 Warszawa, Poland, tel: +628 72 95.

4th International Conference on High Speed Marine Craft: September 7-9, Hotel Caledonien, Kristiansand, Norway

Contact: **Lise Olaussen**, Norwegian Society of Chartered Engineers, P.O. Box 2512 Solli, N-0201 Oslo, Norway, tel: +47 22 94 75 00, fax: +47 22 94 75 02.

Marine Technology Society (MTS) '94 - Challenges and Opportunities in the Marine Environment: September 7-9, Convention Center, Washington, D.C.

Contact: MTS 94, c/o J. Spargo & Associates, Inc., 4400 Fair Lakes Court, Fairfax, Va. 22033, tel: (703) 631-6200; fax: (703) 818-9177.

AWO Fall Convention: September 8-9, Fairmont Hotel, San Francisco, Calif.

Contact: The American Waterways Operators, 1600 Wilson Boulevard, Arlington, Va. 22209, tel: (703) 841-9300; fax: (703) 841-0389.

International Survival and Safety At Sea Exposition & Symposium: September 8-10, Renaissance Center's Westin Hotel, 403 Midland St., Detroit, Mich. 48243.

Contact: **Irwin I. Chaitin**, managing director, International Survival and Safety at Sea Exposition and Symposium, tel: (313) 865-1000; fax: (313) 865-7030.

Breakbulk Transpo '94: September 11-13, New Orleans, La.

Contact: Tel: (904) 736-1585.

SAE International Off-Highway and Powerplant Congress and Exposition: September 12-14, MECCA, Milwaukee, Wis.

Contact: SAE Communications and Meeting Promotion Division, tel: (412) 772-7131; fax: (412) 776-1830.

International Ship and Offshore Structures Congress (ISSC), 1994: September 12-16, St. John's, Newfoundland, Canada

Contact: Institute of Marine Dynamics, P.O. Box 12093, Station A, St. Johns, Newfoundland A1B 3T5, Canada; tel: (709) 772-2469; fax: (709) 772-2462.

Conference on Computer Aided Design, Manufacture and Operation (CADMO) in the Marine and Offshore Industries: September 13-15, Novotel, Southampton, England.

Contact: **Sue Owen**, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton SO4 2AA, U.K., tel: +44 703 293 223; fax: +44 703 292 853.

Oceans '94 - OSATES '94 (Ocean Space Advanced Technology European Show) - "Oceans' Engineering for Today's Technology and Tomorrow's Preservation": Septem-

ber 13-16, Parc de Penfeld, Brent, France
Contact: Oceans '94, Computer Science Dept., Texas A&M University, College Station, Texas 77843, fax: (409) 847-9284.

Greater New Orleans Barge Fleeting Association Seminar: September 14-16, New Orleans, La.

Contact: Tel: (504) 348-7700.

6th Annual National Maritime Heritage Conference: September 14-17, Charlestown Navy Yard, Boston, Mass.

Contact: **Patricia I. Conn**, National Maritime Alliance (NMA), tel: (207) 443-4550

Electronic Data Interchange Conference & User Group Meeting: September 19-21, Westin Galleria/Oaks, Houston, Texas.

Contact: API, 1220 L. Street, N.W., Washington,

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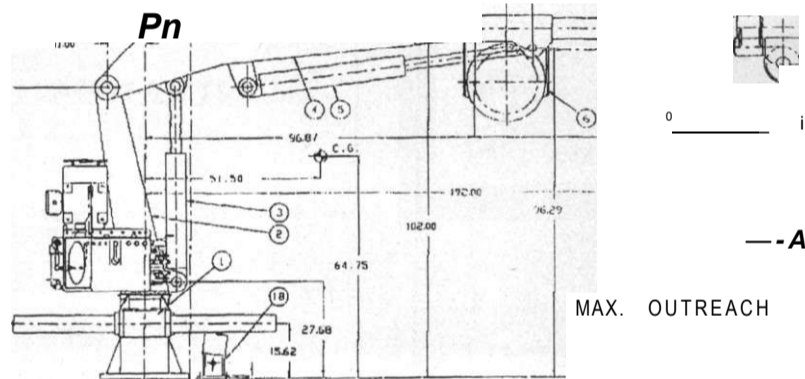
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CALENDAR

D.C. 20005, tel: (202) 662-8000; fax: (202) 682-8223.

Satellite Communications Users Conference (SCUC): September 19-21, Sheraton Washington, Washington, D.C.

Contact: **Jon Lehl**, Account Executive, Argus Trade Shows, 6151 Powers Ferry Road, N.W., Suite 300,

Atlanta, Ga. 30339, tel: (404) 618-0423; fax: (404) 618-0441.

Propellers/Shafting '94 Symposium: September 20-21, Cavalier Hotel, Virginia Beach, Va.
Contact: **J.E. Ancarrow, Jr.**, tel: (804) 688-1070.

International Marine Purchas-

ing Association (IMPSPA) Marine Exhibition and Conference - "Suppliers Meet with the Buyers" and "Cost Versus Quality Versus Reliability": September 21-22, Novotel Hotel, Hammer-smith, London.

Contact: **Paul D. Smith**, CEO, IMPA, tel: +44 206 322822; fax: +44 206 322890.

National Waterways Conference: September 21-23, New Orleans, La. Contact: tel: (202) 296-4415.

Combat Systems Symposium - Littoral Warfare Impacts on Naval Engineering: September 22-23, Mandalay Beach Resort, Oxnard, Calif. Contact: American Society of Naval Engineers (ASNE), 1452 Duke St., Alexandria, Va. 22314-3458.

Society of Petroleum Engineers (SPE) Annual Technical Conference & Exhibition - The Energy of Change: September 25-28, Ernest N. Morial Convention Center, New Orleans, La.
Contact: **Fred Herbst**, Public Relations Manager, SPE, P.O. Box 833836, Richardson, Texas, tel: (214) 952-9393; fax: (214) 952-9435.

American Petroleum Institute (API) Information Systems Committee Meeting: September 26-28, La Quinta Hotel, La Quinta, Calif.
Contact: API, 1220 L. Street, N.W., Washington, D.C. 20005, tel: (202) 662-8000; fax: (202) 682-8223.

World Gaming Congress & Expo: September 26-28, Las Vegas Convention Center, Las Vegas, Nev.
Contact: World Gaming Congress & Expo, Gaming & Wagering Business, Seven Penn Plaza, New York, N.Y. 10001-3900, tel: (212) 594-4120 or (800) 223-9638; fax: (212) 714-0514.

Shipbuilding Machinery & Marine (SMM) Technology Exhibition & Conference: Sept. 27-Oct. 1, Hamburg, Germany
Contact: **Martin Greve**, tel: +49 40 3569 2146; fax: +49 40 35 69 2149.



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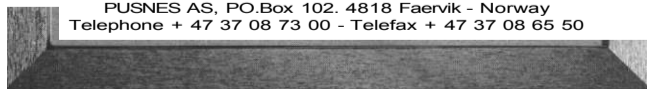
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OCTOBER

Northeast Waterborne Gaming Conference & Exhibition: October 3-4, Whitehall Club, 17 Battery Place, 30th Floor, New York, N.Y.
Contact: The Maritime Association of the Port of NY/NJ, tel: (212) 425-5704.

American Association of Port Authorities (AAPA) 83rd Annual Convention: October 3-7, Wyndham Franklin Plaza Hotel, Philadelphia, Pa.
Contact: AAPA, 1010 Duke St., Alexandria, Va. 22314, tel: (703) 684-5700; fax: (703) 684-6321.

3rd International Conference on Safety in the Port Environment: "The Impact of Port Services on Safety and the Environment": October 10-12, Bremen, Germany.
Contact: **Nargis Rashid**, Ports of Bremen/Bremerhaven, U.S./Canada Representation, Carl F. Ewig, Inc., 910 Oak Tree Road, S. Plainfield, NJ 07080, tel: (908) 756-3944; fax: (908) 756-2575.

Society of Petroleum Engineers (SPE) Petroleum Conference and Exhibition of Mexico: Octo-

Maritime Reporter/Engineering News

CALENDAR (Continued)

ber 10-13, Expover Convention Center, Boca del Rio, Veracruz. Contact: SPE Registrar c/o IEL, 1635 W. Alabama St., Houston, Texas 77006-4196, tel: (713) 529-1616; fax: (713) 529-0936.

Propeller Club of the U.S. 68th Annual Convention and 1994 Conference: October 10-14, Royal Sonesta Hotel, New Orleans, La. Contact: The Propeller Club of the U.S., 3927 Old Lee Highway, #101A, Fairfax, Va. 22030

NACE Conference and Exhibition - Partnering for Corrosion Control: October 12-14, Orlando, Fla.

Contact: **Louis MacDowell**, Conference Chairman, NASA, Mail Code DM-MSL-22, Kennedy Space Center, Fla. 32899, tel: (407) 867-3400. For exhibitor information, contact: **Kyle Greenfield**, P.O. Box 126, Cocoa, Fla. 32923, tel: (407) 631-2659.

Fish Expo '94 Boston: October 13-15, World Trade Center, Boston, Mass. Contact: Diversified Expositions, 5 Milk Street, Portland, Me. 04112, tel: (207) 772-3005; fax: (207) 772-5059.

American Petroleum Institute (API) Fall Committee on Petroleum Measurement: October 14-23, Loews L'Enfant Plaza, Washington, D.C.

Contact: API, 1220 L. Street, N.W., Washington, D.C. 20005, tel: (202) 662-8000; fax: (202) 682-8223.

WEFTEC '94 - Water Environmental Federation's 67th Annual Conference & Exhibition: October 15-19, McCormick Place North, Chicago, Ill.

Contact: **Nancy Blatt**, Director-Public Information, WEF, 601 Wythe St., Alexandria, Va. 22314-1994, tel: (703) 684-2400; fax: (703) 684-2492.

American Petroleum Institute (API) Refining Autumn Meeting: October 17-19, Westin Century Plaza, Los Angeles, Calif. Contact: API, 1220 L. Street, N.W., Washington, D.C. 20005, tel: (202) 662-8000; fax: (202) 682-8223.

CINAVAL (Congress of Naval and Marine Engineering and Oceanic Sciences)/SYMMREPAIR (Symposium on Maintenance and Repair)/EXPOVAL (Shipping and Offshore Exhibition): October 17-20, Veracruz, Mexico
Combined CINAVAL/SYMMREPAIR/EXPOVAL conference and exhibition. Contact: **Ing. Fernando Olavarrieta**, tel: +52 29 34 9962 34 6561; fax: +52 29 34 5910 34 5089.

International Tug, Towage & Salvage Convention & Exhibition (ITS '94): October 17-21, Grand Harbour Hotel, Southampton, U.K. Contact: **Allan Brunton-Reed**, managing director, The ABR Company Limited, Dunelm, Church Road, Claygate, Esher, Surrey KT10 OJP, U.K., tel: +44 372 468 387; fax: +44 372 468 388.

Odessa 200 - International Shipping Exhibition: October 18-20, Odessa, Ukraine
Contact: **Roderick Keay**, Dolphin Exhibition, 112 High Street, Bildeston, Suffolk IP7 7EB, England, tel: +44 449 741801; fax: +44 449 741628.

Pacific Fishing Exchange: October 20-22, Pier 48, Port of Seattle, Wash.
Contact: **Bruce Buls**, Pacific Fishing Expo, 1515 Northwest 51st St., Seattle, Wash. 98107, tel: (206) 789-5333; fax: (206) 784-5545.


European Petroleum Conference: October 25-27, London, England. Contact: SPE, Office, 4 Mandeville PL, W1M 5LA, London, England, tel: +44 71 487 4250; fax: +44 71 487 4229.

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New Video On Lifeboat Operation And Survival Available

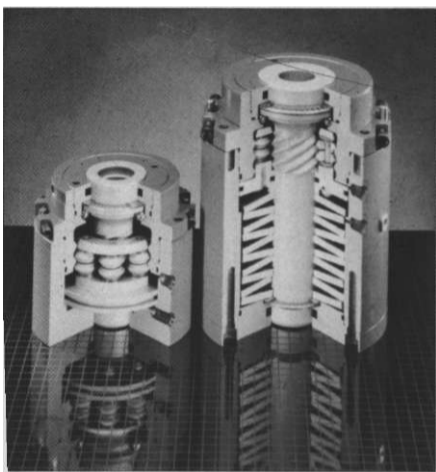
Moxie Media of New Orleans released "Lifeboat Operation and Survival Practices," the third of seven programs in its Marine Survival safety video series. The 20-minute training video is designed for both crewboat commanders and passengers, as it identifies all major components, including davits, release mechanisms and deployment systems.

For information on the video
Circle 114 on Reader Service Card

Hydraulic Valve Actuators Offer High Torque Output From Small Size

Helac Corp.'s PV Series/Double Acting and PS Series/Spring Return hydraulic valve actuators

reportedly offer high torque output from an ultra-compact size. Standard features on the unit include adjustable rotation, no backlash, direct bolt-mounting to the valve bonnet without brackets or intermediate couplings and zero leakage for drift-free holding. Standard options include manual overrides, position indicators, limit



switches, submersible seals, electro-hydraulic power packs and integrated four-way control valves. The PV Series offers torque output to 50,000 IN-LB at 3,000 psi; the PS Series offers torque output to 9,500 IN-LB at 1,500 psi.

For more information from Helac
Circle 115 on Reader Service Card

Two Promotions At Midland Manufacturing; Increased Focus On Marine Market

Midland Manufacturing Corp., makers of vapor recovery and alarm systems for the marine industry, appointed **Gaston C. Barmore** as director of technical services and **Norman A. Magiera** as manager of marine sales. Mr. Barmore will supervise the development of new products and technical support of customers. He has been with Midland for 18 years. Mr. Magiera is responsible for on-site field support as well as sales of both Midland's Factory Mutual-approved alarm systems and its vapor recovery system components, which are U.S. Coast Guard (USCG)-approved and satisfy the requirements

of 46 CFR Part 30. Midland also announced the start of a toll-free 800-number to ease its access to customers. The new number is (800) 615-6179.

Product Introductions/Announcements
The company also introduced the B-610 high liquid level indicator, which permits easy visual reading of content levels in the upper one meter of any tank. The company said it is suitable for tank barges, container vessels and tankers.

For more information on Alfa Laval
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The B-594 tank overflow sensor has gained Factory Mutual approval, a requirement of USCG 46 CFR Part 30. For use as an alarm, a patented feature provides a magnet embedded in the rod, which triggers the intrinsically safe sensor encased in the B-594 housing. The alarm point is field adjustable for a wide range of product density changes. The type 316 stainless steel housing is prepared to withstand the highly corrosive marine environment. Finally, Midland announced that its full line of intrinsically safe alarm systems has been approved by Factory Mutual.

For more information from Midland Manufacturing
Circle 119 on Reader Service Card

Skookum/RopeMaster Adds Economy Trawl Block

Skookum/RopeMaster, a maker of heavy-duty wire rope blocks and rigging products, added an economy trawl block line for commercial fishing. The line, known as BCM trawl blocks, was purchased from J.P. Lagerloef of Southport, Fla. All BCM blocks will be manufactured and sold out of Skookum/RopeMaster's plant in Hubbard, Ore.

For more information on the new BCM line
Circle 116 on Reader Service Card

Company Offers In-Place Reconditioning Of Motors, Generators

Electrosolve Services of Costa Mesa, Calif, has released a video illustrating its in-place service and maintenance process for large rotating electrical equipment. The video highlights Electrosolve's time-proven, proprietary process that is designed to provide "like new" results.

For more information from Electrosolve
Circle 120 on Reader Service Card

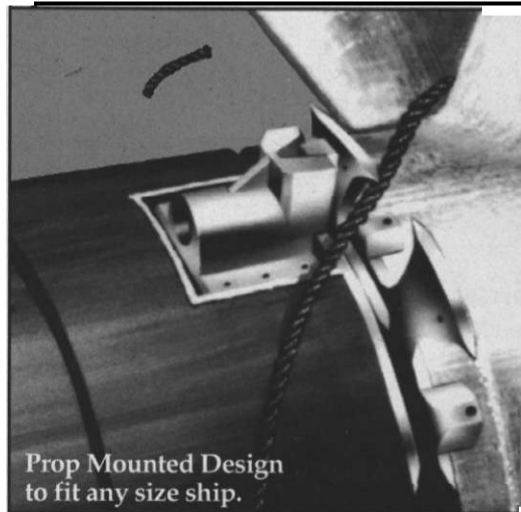
Fluid Dialysis System Designed To Remove Impurities

The Fluid Dialysis system, exclusively licensed worldwide by Industrial Technology Processes Corp. (ITP), is used for cleaning many hydrocarbon-based fluids of particulate matter. The system removes particulate contamination that is left in the oil when filtered by mechanical means. According to ITP, removing the impurities improves the lubricating and chemical properties of the oil.

The heart of the system is the ion injection and filtration cartridge that ionizes the particulate matter both positively and negatively. The result of this operation, in short, is the prompt removal of all large particles that have the ability to cause frictional wear.

For more information from ITP
Circle 121 on Reader Service Card

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Advanced Hydrographic Research Vessel Named At Mjelle & Karlsen

The advanced hydrographic research vessel *Karan 8* was officially named at Mjelle & Karlsen Verft in Bergen, Norway. The vessel is the 147th built at Mjelle & Karlsen and is under construction for the Saudi Arabian oil company Saudi Aramco. The contract for the construction of *Karan 8* was awarded in July 1992 and is worth approximately \$30 million. *Karan 8* will be used for a variety of hydrographic tasks, including: hydrographic surveys aimed at the production of detailed and highly accurate charts; survey of oil-pipes on the seabed; survey of offshore-installations and submarine installations; inspections and NDT-testing of oil-pipes and underwater installations; site surveys and engineering surveys.

Norcontrol Wins Contract From Japan Fisheries Assoc.

Norcontrol was awarded the contract for the supply of a radar and navigation simulator to Japan Fisheries Association. The simulator system will be installed in Petrapavlovsk, Kamchatka, Russia, as part of a fishery agreement between Japan and Russia.

The simulator installation consists of a standard Norcontrol NMS-90 bridge simulator and a five-channel Norview 200 visual imaging system. The Marine Group/Norcontrol has also signed a contract with the Department of Fish and Game of the State of California Office for Oil Spill Prevention and Response (OSPR) for the supply of a Resource Information Management System (RIMS). This system evolved from the advanced resource information module of the Norcontrol Oil Spill Management Trainer (NTT-2000 OSMT).

For more information on Norcontrol
Circle 61 on Reader Service Card

Nautronix To Supply DP System For USCG WLB

Nautronix, Inc. was awarded a contract to supply a dynamic positioning system for the second 225-ft. (69-m) Sea Going Buoy Tender (WLB) for the U.S. Coast Guard (USCG). The vessel will be built by Marinette Marine Corp. of Marinette, Wis.

The contract provides the USCG with an ASK 4000 system for the first option vessel. Nautronix has delivered two dynamic positioning systems to Marinette for the first WLB shipset and a mockup.

Additionally, Nautronix has delivered the first Coastal Buoy Tender (WLM) dynamic positioning system. The vessel's functions are to conduct missions in aids to navigation, search and rescue, law enforcement and national defense.

The buoy tenders are also designed with the capability to make a

significant contribution to marine environmental protection. The Nautronix ASK 4000 system will enable the WLM and WLB class ships to maintain position over a fixed point on the earth alongside floating aids to navigation and follow a predetermined track. The system also operates as an adaptive autopilot.

For more information on Nautronix
Circle 63 on Reader Service Card

President Clinton To Chair 1994 AOTOS Dinner

President Clinton will serve as honorary chairman, and Lane Kirkland, president of the AFL-CIO, will be general chairman of the 1994 Admiral of the Ocean Sea Award (AOTOS) dinner. This year's event will honor two maritime labor leaders: National Maritime

Union's Louis Parise, president of District No. 4-NMU/MEBA, AFL-CIO; and Michael Sacco, president of the Seafarers International Union of North America, AFL-CIO.

This year's industry dinner and dance will be held October 28 at the Sheraton New York Hotel and Towers. AOTOS honors those within the industry who have made significant contributions to American shipping and American seafarers.

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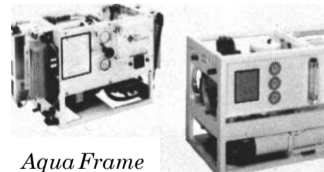
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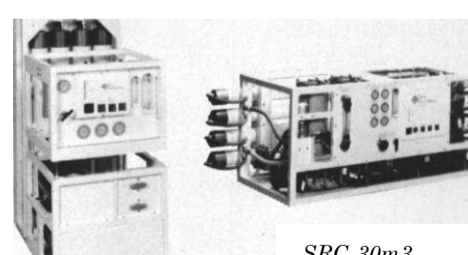
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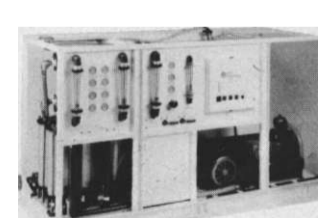
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Circle 249 on Reader Service Card

SHIPBUILDING TECHNOLOGY

Astilleros Espanoles' Puerto Real Yard Preps Shuttle Tanker For Delivery

Knutsen-owned vessel reportedly first diesel-electric-propelled shuttle tanker to be built and delivered

A unique diesel-electric-propelled shuttle tanker, being built for Norwegian ship owner Knutsen, was recently floated out at Astilleros Espanoles' Puerto Real yard.

The vessel incorporates a host of technologically advanced equipment and systems, including Sulzer main generators driving engines, an ABB main propulsion electric motor, Saab cargo tank level indicators and Sigma coatings (please see "Equipment List" on this page for full details).

The vessel, to be called the *Hanne Knutsen*, was contracted for with Astilleros Espanoles in 1992, and is scheduled for delivery this December, two months ahead of schedule. The original contract called for two shuttle tankers with an option for a third.

The *Hanne Knutsen* has a length overall of 869 ft. (265 m), with a 139-ft. (42.5-m) molded breadth and a 50.8-ft. (15.5-m) molded summer draft.

The Power

Classed by DNV, the ship's propulsion motor is an electric, ABB reversible type, with a continuous speed rating, by means of cycloconverters, of 19,000 kW at 98 rpm, which allowed the vessel to reach a speed of 15.3 knots during trials. As the vessel will be required to operate in special conditions which will include significant waves, it is outfitted with five thrusters (three bow, two aft) rated at 1,750 kW each, as well as a DPS and active rudder.

The main generating plant on the *Hanne Knutsen* is comprised of four diesel generator sets of 6,275 kW at 6,600 V each, and two transformers of 6,600/440 V. It also features a 1,200-kW port diesel generator and one emergency diesel generator set.

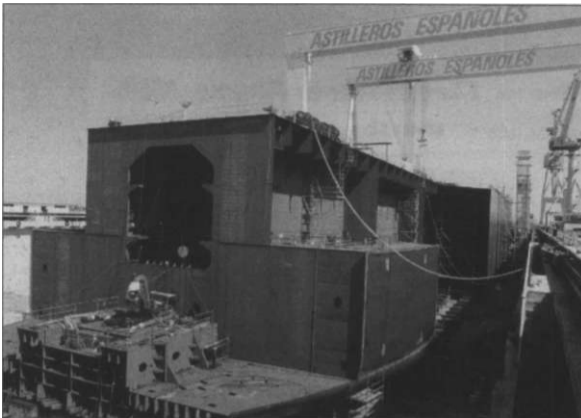
Both the main generating plant and the auxiliary engines, the electrical arrangement, the motor and its control systems have been designed to the Electrical Redundancy Propulsion (ERP) standard of DNV. There are double independent spaces for each pair of main diesel generators, main electrical and cycloconverters, switchboards, purifiers, etc. The ship also features a centralized fresh water cooling system for the main diesel engines, as well as for the main alternators, auxiliary systems and electric motors of the thrusters. Sea water cooling circuit pipes are made of copper-nickel.

Loading System

In addition to the conventional loading systems, the vessel is equipped with two "offshore" loading systems: one for articulated loading turrets (APC) and buoys (OLS); and a submerged turret loading system (STL). The *Hanne Knutsen* is reportedly the first newbuilding incorporating both systems.

The loading systems and tank arrangements are designed to handle crude oils with low vapor tensions in two segregations.

Those on hand for the *Hanne Knutsen's* floating ceremony were: (far left) Mr. Fernandez, general director of Southern Division of Astilleros Espanoles and general manager of Puerto Real yard; (second from right) Mr. Moe, chairman, Knutsen; and (far right) Mr. Alborno, chairman, Astilleros Espanoles.



The diesel-electric-propelled *Hanne Knutsen* under construction at Astilleros Espanoles' Puerto Real yard.

Four transversal collectors have been installed in the cargo manifold for crude oil, and two others to send the cargo vapors to shore. Inert gas is generated and purified in a Flexinert plant with the vapors coming from the main diesel generators.

The ship features a sophisticated integrated control system redundantly computerized with process stations and a local area network (LAN) with control stations in the engine room, cargo control and wheelhouse.

The automation system in the engine room is designed to be operated without personnel, and the automation in the wheelhouse is designed to be operated by one person.

For more information on Astilleros Espanoles
Circle 19 on Reader Service Card

Equipment List

Main generators driving engines	Sulzer	Transformers	G. Asturiana
Auxiliary generator engine	Bergen	Electric cables	G. Gral. Cables
Main propulsion electric motor	ABB	Electric cables (automation)	Ericsson
Electric generators	ABB	Radio telephones UHF	Italis S.A.
Shaft line.....	Foarsa	Fire detection	Salwico
Stern tube bearing	Rolla	DPS	Simrad
Propeller	Navalips	Radio communications	S.R.M.
Main & exhaust gas boilers	San Carlos	Radars	Atlas-Krupp
Boiler feed pumps	Aranzabal	Gyropilots	Anschutz
Emergency generating set	Caterpillar	Dopplerlog	Atlas-Krupp
F.W. generating plant	Alfa Laval	Echosounding	Simrad
Coolers	Alfa Laval	Satellite navigator	SaturvABB
Centrifugal pumps	Kvaerner Eureka	Bridge integration	Kvaerner Eureka
Screw pumps	Kvaerner Eureka	Integrated control system	Simrad
F.O. & L.O. purifiers	Alfa Laval	Deck machinery	Ulstein
A.E. fuel preparation equipment	Sedni	Service crane	Navacel
Foam F.F. system	Unitor	Access hatches	Faro
Air compressors	Roweco	Coatings.....	Sigma
Sanitary equipment	Aranzabal	Lifeboats & davits	Harding
Sewage treatment plant	Aries	Modular cabins	AESA
Engine room fans	Sumivent	Air conditioning	Novenco
Steering gear	Porsgrunn	Modular washrooms	M. Jumilla
Transverse bow & stern thrusters	Ulstein	Cargo, ballast & stripping pumps	Kvaerner Eureka
Active rudder	Willi becker	Oil monitoring system	Seres
Steel pipes	Almesa/Cunado	Tank cleaning equipment	Consilium
GRP pipes	Sarplast	Inert gas generating plant	Maritime Protection
Butterfly/Gate valves	D. Nakakita/Hermar	Pressure & vacuum valves	Pres-Vac
Engineer shop machinery	Gandara	Cargo valves & control system	Kvaerner Eureka
Main switchboard & cycloconverters	ABB	Cargo tanks level indicators	Saab
Secondary switchboards	Inelectri	Gas detection equipment	Omicron



Schelde Gears Pushes Services Partnerships

Schelde Gears is not limited to the design, manufacture and repair of gear transmissions.

The company has a vast knowledge databank, and can assist customers — when a gearing is damaged — to assess the cause of damage and advise on countermeasures to help avoid future costly and time-consuming replacements.

For more information on Schelde Gears
Circle 92 on Reader Service Card

Crowley Announces New Service To Bahamas

Crowley American Transport will start a new container and RoRo service between Florida and the Bahamas. Ken Tice has been appointed to the position of director, Bahamas Service. Crowley will deploy a 42-TEU capacity RoRo vessel which has the ability to significantly increase capacity by using LoLo technology if required.

Tri Tool Offers Product Information Via Video

Tri Tool Inc. offers an informational videotape featuring the benefits and economic solutions that portable pipe machining equipment provides. The tape illustrates Tri Tool equipment specifically designed for utility maintenance, production, construction, and welding operations.

For information on receiving a video,
Circle 90 on Reader Service Card

MAN B&W To Market L32/40 As Genset

To secure its position in the generating set market, MAN B&W has decided to market the L32/40 as a generating set in the group's facilities in Holeby, Denmark. This decision was made in light of MAN B&W Diesel A/S, Holeby's position as a leading supplier of heavy fuel gensets, with the renowned 23 and 28 Series. By the company's reckoning, MAN B&W Holeby holds a worldwide market share of 30 percent. This move is seen as expanding that market share, as the L32/40 is capable of covering the upper range of the marine genset market, with applications on larger containerships and cruise vessels. The L32/40 is the diesel group's latest development in the four-stroke area, and is available in five to nine cylinder versions, covering output from 2,200 kW up to 4,000 kW at 720 rpm. The first genset order for this engine type was gotten from Odense Steel Shipyard, Ltd. of Denmark for use on six, 4,800-TEU container vessels. The gensets are scheduled for

delivery from August 1995 to December 1996.

For additional information on
MAN B&W Holeby
Circle 93 on Reader Service Card

Metos Marine Wins Several Contracts

Finland-based Metos Marine an-

nounced it was awarded several large, turnkey contracts recently with shipyards in the Far East and Europe. Recent deliveries were for the *Paglia Orba* built at French yard ACH Le Havre, and the passenger/RoRo *Finnhansa*, built at Gdansk shipyard in Poland.

Kvaerner Masa Yards placed orders with Metos for the main galley for CCL's new *Inspiration* and for LNG tankers and cable laying ves-

sels being built at the Turku shipyard. A similar order was placed by Chantiers de l'Atlantique in France for the *Super Napoleon*. Finally, Metos Marine won a contract for the supply of all catering equipment and furniture including design for Sembawang Shipyard in Singapore for the conversion of the pipe laying vessel *Solitaire*.

For more information on Metos Marine
Circle 84 on Reader Service Card

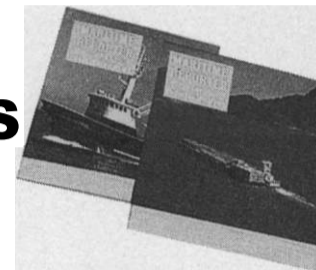
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Hulls & Appendixes – by Nils Lucander

(Continued from page 84)

again for more than 35 years.

What has not been discussed is how diesel engines work. When a propeller blade enters turbulent water caused by rotating shafts or other obstructions, pressure on it is reduced without reaction by the en-

gine. Then, as the blade re-enters solid water, the blade load increases suddenly, sending a signal through the power train, demanding more fuel.

This will not happen when there exists none or so little turbulent

water that the blade load remains constant.

What must be emphasized is that any appendix or keel added under water must be properly shaped to fit hydrodynamic natural laws, not man-made assumptions, theories and beliefs.

Personally, I began my fuel saving work in the late 1950s when challenged to design a small 40-ft. (12-m) tug yacht to run at one penny

a mile and get triple design fee, or just half if I did not succeed. At the time, diesel fuel sold for five cents a gallon.

Fitted with one 30-hp engine, the Great Lakes yacht ran at 7.53 statute miles burning 1.5 gallons at a cost of 7.5 cents, which translated to .996 penny per mile. I received my triple fee and my designs have ever since been part of saving fuel.

After this, I began to work on reducing wave making since — in theory — it represents about 75 percent of overall resistance.

When a boat moves through the water, displacing it, the direction of least resistance is up to the surface, producing waves. I have called this the "Pump Effect."

The long-since abandoned British Codfish Head - Mackerel Tail hull forms with blunt bows pumped the water up quickly to form the lifting transverse bow wave.

The taper towards the stern caused the midships trough and stern wave. While this hull shape has been discarded, many naval architectural theories, rules, numbers and formulas on hull speed — like the square root of the WL x 1.34 — are based on the performances of these abandoned and inefficient boats, retained in textbooks and technical papers.

Any hydraulic engineer can confirm that the faster water is pumped up, the more power is used, wasted. To delay this "Pump Effect," I made bow sections finer, eliminating the transverse bow wave.

I then moved the largest sections of hull aft of midships and with the emergence of twin aft keels on full displacement boats, the upward motion of water was delayed even more, in most cases eliminating both the trough and stern wave up to so-called hull speed, sometimes even when running faster.

The 80.5-ft. tug shows a midships wave at 13 knots or 10 percent over formula speed.

A midships trough forces propellers to suck scarce water, adding to the trough depth, but a midships wave increases water availability and this is another reason why all the "3-Point" boats are so efficient.

It is also clear the addition of aft keels adds to course holding, reduces roll and chances of broaching. All of this makes these boats excellent work platforms, liked by the crew which in turn increases their efficiency and, with big fuel savings, adds to overall profitability.

While more than two dozen "3-Point" boats were designed in the 1980s and before, more than a dozen have been done in the 1990s to date. They include a 100-ft. (30-m) longliner for Tahiti and two smaller fishing vessels, five trawler yachts sizes 34 to 63 ft. (10 to 19 m), and, surprisingly, four husky cruising sailboats.

A purpose-designed 100-ft. (30-m) dive boat is currently under construction in British Columbia using old growth Douglas Fir, epoxy encased strip planking. Just begun is the design of a 78-ft. (24-m) "3-Point" trawler yacht, and the interest in these is growing.

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Liability Avoidance Training Programs Available

Maritime Liability Avoidance training programs, which were reportedly widely attended in the 1980, are back in 1994. Given by Fisher Maritime Transportation, the programs will be conducted in nine cities in the fall of 1994, including Atlantic City, Boston, New Orleans, New York City, Norfolk, San Francisco, Seattle, Tampa and Washington, D.C. Some of the topics that will be addressed include court-tested criteria for evaluating design alternatives, whether inspection of a vessel can create liabilities, how inadequate manuals can "hand" a case to a plaintiff, and why adherence to industry and regulatory standards can create potential liabilities.

For more information,
Circle 107 on Reader Service Card

Wharf Automation System Monitors Ship Movements, Dock Maneuvers

The Wharf Automation System from Tribar Industries is designed for marine port operations to monitor vessel movements and docking maneuvers with no attending personnel required. The system reportedly detects, signals and displays ship speed violations, and provides a permanent video and data record of the activity. For situations where a damage incident has occurred, this record can provide valuable supporting evidence.

The system's major components are microwave radar units to detect a moving vessel and measure its speed; yellow/red flasher kit to sig-

nal the pilot if the ship is under or over the preset speed limit; a three-digit LED sign to display speed to the pilot; and S-VHS cameras to film the vessel's maneuvers.

For more information
Circle 108 on Reader Service Card

Von Wormer Named President Of Wright-Austin

The Wright-Austin Co., a Detroit manufacturer of industrial gas/liquid separators, exhaust heads, automatic drain traps and air vents, announced the election of **Christiansen (Chris) von Wormer** to the position of president and general manager.

Mr. von Wormer has been associated with the company in various capacities since 1978. He has served on the board of directors and has been with the company full time since May 1990, when he was appointed vice president and sales manager.

Corroseal Introduces Corrozyme Enzyme Cleaner

Corrozyme Enzyme Cleaner from Corroseal is a 100 percent biodegradable, non-toxic and environmentally safe cleaner, shipped in concentrate. Reportedly safe for use in all mechanical applications and able to be diluted with either fresh or salt water, the product is recommended for cleaning metal and painted surfaces prior to rust conversion and/or repainting. It is a final stage cleaner which reportedly will not penetrate layers of hard oil or grease deposits.

For more information from Corroseal
Circle 109 on Reader Service Card

Autronica Helps In Refit Of MarAd Vessel Cape Taylor

Autronica Marine of Northvale, N.J. recently completed the refitting of a new E.R. monitoring system on the MarAd vessel *Cape Taylor*. The Autronica KD-10 engine room monitoring and alarm system was part of a turn-key project, which included the removal of the old equipment, delivery of the new Autronica System, console modification, installation and start up. The installation and start up was completed in less than a month.

For more information on Autronica
Circle 110 on Reader Service Card

Maritime Services Corp. Enjoys Heavy Work Load

Maritime Services Corp. (MSC) has added a number of gaming vessel refurbishment's to its roster of newbuilding gaming projects. Refurbishment projects include Holland America's *Nieuw Amsterdam*, *Star of Texas*, owned by Gold Star Cruises, and a project at Jeffboat for Aztar gaming.

The *Nieuw Amsterdam* underwent a complete refurbishment of the existing casino space in May. Six days in drydock concluded with on-time completion of the job.

The *Star of Texas*, which began its life as a cruise ship, now operates as a day-trip cruise-to-nowhere gaming vessel. Work was completed dock-side in Galveston, and included many upgrades such as painting and floor work, as well as bulkhead repair work, decorative moldings and refurbishing an elevator.

For more information on MSC
Circle 111 on Reader Service Card

Monitoring Program Now Available For Windows

Monico Computer announced that WinMonitor, a high performance Man Machine Interface (MMI) suitable for most data acquisition applications and a popular Macintosh-based program, is now configured for Windows use.

WinMonitor reportedly provides timely and accurate information regarding process performance and equipment condition.

It is designed to replace any panel containing gauges or status lights and can simultaneously monitor up to 2,880 pressures, temperatures, etc.

For more information
Circle 112 on Reader Service Card

Jamestown Finds Good Business Prospects In Gaming Market

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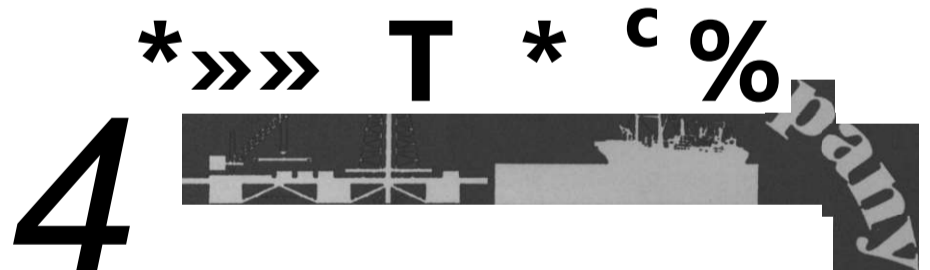
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PRODUCTS AT COMPETITIVE ^

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BUYERS DIRECTORY

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

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Ervin Industries, Inc., 3893 Research Park Drive, Ann Arbor, MI 48106-1668

ABSORBENT PRODUCTS

First Northern Environmental, Inc. 32 Brill St., Newark, NJ 07105

ADHESIVES

Life Industries, Corp., 205 Sweet Hollow Rd., Old Bethpage, NY 11804

AIR COMPRESSORS

Sperre Industri A/S, N-6057 Ellinosoy, NORWAY
U.S.A. Reps: Ocean Power 571 Central Avenue, New Providence, NJ 07974

AIR CONDITIONING AND REFRIGERATION—Repair & Installation

Adrick Marine, 141D Central Ave., Fatmingsdale, NY 11735
Bailey Group, 2323 Randolph Ave., Avenel, NJ 07001
Bill Brown Enterprises, Inc., 4995 Ocean Pines, Berlin, MD 21811
Carrier Transicold, P.O. Box 4805, Syracuse, NY 13221
Johnston Brothers, 180 Enterprises Avenue, Patterson, LA 70392

ALARMS, FACTORY MUTUAL-APPROVED

Midland Mfg. Corp., 7733 Cross Point Rd., Skokie IL 60076-0226

ANODES/CATHODIC PROTECTION

American Corrosion Services, 218 Rue Beaugerd, Ste. B., Lafayette, LA 70508

ANTENNAS-Rate of Turn Indicator

Rivetronics, 2624 East Broadway, Alton, IL 62002

ASBESTOS ABATEMENT

Chemplex Environmental Prod., Inc., 3405 Highway 33, Neptune, NJ 07753

AUCTIONEER

Forke Bros., 3901 Faulkner Drive, Lincoln, NE 68516

BALLAST

Chesapeake Specialty Products, 5055 Norttpoint Blvd., Baltimore, MD 21219
Genstar Stone Products, Executive Plaza IV, Hunt Valley, MD 21031
Mineral Research & Recovery Inc., 4565 S. Palo Verde, Ste. 203 Tucson, AZ 85714

BARGE BUILDING

Conrad Industries, P.O. Box 790, Morgan City LA 70381

BASKET STRAINERS

Beaird Industries, P.O. Box 31115, Shreveport, LA 71130

BEARING—Rubber, Metallic, Non-Metallic

B.F. Goodrich, Engineered Polymer Products, 150 Division Dr., Wilmington, NC 28401
Blohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1, GERMANY;
U.S.A. Reps: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363p, -0168
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Thordon Bearings Inc., 3225 Mainway, Burlington, Ont., CANADA L7M 1A6

BILGE OIL/FUEL ABSORBER

The Bilge Rat, P.O. Box 4244, Fort Walton, FL 32549
Northstar Marine, 84 Wall Street, Fatmingsdale, NY 11735

BOW THRUSTER

W. Boterman, HoHenbroekerdijk 40, 8031 ER Zwolle, The Netherlands

BROKERS

151 Maritime Services, 34062 El Encanto/B, Dana Pt. CA 92629
Captain Astad Company, Inc., P.O. Box 350486, Ft. Lauderdale, FL 33335
Emerald Yacht & Ship Brokers, 759 N. Milwaukee St., # 552, Milwaukee, WI 53202
Jack Faulkner, 2419 Caddy Lane, P.O. Box 371, Flossmoor IL 60422
Mowbray's Tug & Barge Sales Corp., 35 De Hart St., Morristown NJ 07960

BULKHEAD SEALS

Blohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1, GERMANY
U.S.A. Reps: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168
John Crane Marine USA, 1536 Barclay Blvd., Buffalo Grove, IL 60089

CABINETRY

Fenco, 1901 Route 130, Burlington, NJ 08016

CEILINGS, DECORATIVE METAL

The Gage Corp., 803 S. Black River St., Sparta, WI 54656

CELLULAR TELEPHONE SERVICE

Cellnet Corp., 400 Main St., Ste. 800, Stamford, CT 06901-3004

CHAINS

Crandall Dry Dock Engineers Inc./Marit Chain, 21 Pottery Lane, Dedham MA 02026
Milligan Marine Supply, 5832 Harvey Wilson, Houston, TX 77020
Washington Chain & Supply Inc., Box 3645, Seattle, WA 98124
Waterman Supply Co., P.O. Box 596, Wilmington, CA 90748

CHAIRS

Gasser Chair Co., 4136 Loganway, Youngstown, OH 44505
Shelby Williams Industries, Inc. 150 Shelby Williams Dr., Morristown, TN 37813
Turnbull, Inc., 3818 134th St. N.E., Marysville, WA 98271

CHEMICALS

Drew Ameroid Marine, One Drew Plaza, Boonton, NJ 07005
Vecom Refrigeration USA, 1201 Corbin St., Elizabeth, NJ 07201

CLAMPING—Pipe, Tubes, Hose

ZSI, 12749 Richfield Ct., Livonia, MI 48150

CLASSIFICATION SOCIETY

American Bureau of Shipping, 2 World Trade Center, 106th Fl, New York, NY 10048

CLEANING CHEMICALS

Duratech Industries, 1371-3 Church St., Bohemia, NY 11716

COAMING WELDER

Bug-O-Systems 3003 W. Carson St., Pittsburgh, PA 15204

COMPACTORS

International Compactor, 1088 Lighthouse Ln., Hilton Head Island, SC 29928

COMPOUNDS

ITW Philadelphia Resins, 130 Commerce Dr, Montgometryville, PA 18936

COMPUTER LOFTING

Barataria Lofting Co., Inc., 1616 Barataria Blvd., Ste. 4, Marrero, LA 70072

COMPUTERIZED INFORMATION SYSTEMS

Autoship Systems Corp., #403, 611 Alexander St., Vancouver, BC, Canada V6A1E
Creative Systems, Inc., P.O. Box 1910, Port Townsend, WA 98368
Gallagher Marine Systems, 1020 N. Fairfax St., Alexandria, VA 22314
Intergraph Corporation, 2051 Mercator Drive, Reston, VA 22091-3413
Kockums Computer Systems AB, PO Box 50555, s-202 15 Malmo, SWEDEN
Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
TIMSCO, P. O. Box 91360, Mobile AL 36691

CONDENSERS/SEPARATORS

Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130

CONTROL SYSTEM-Monitoring

Autronica Marine A/S, Drammensveien 126, N-0277 Oslo 2, NORWAY
Electronic Design Inc., 3020 20th St., Metairie, LA 70002
IMO Industries, Gems Sensors Division, One Cowles Rd., Plainville CT 06062
Kobelt Manufacturing Co., Ltd., 11720 Horseshoe Way, Richmond, BC, Canada
MMC International, 60 Inip Dr, Inwood NY 11696
Marine Electric RPD, Inc., 50 Carol St., P.O. Box 1135, Clifton, NJ 07014-1135
Robertson Marine Systems, 3000 Kingman St., Suite 207, Metairie, LA 70006
Teleflex Naval technologies, 205 Church Rd., North Wales, PA 19454

CONTROL SYSTEM-Steering

KGW Schweriner, Wismarsche Strasse 380, 19055 Schwerin, GERMANY
Kobelt Manufacturing, 11720 Horseshoe Way, Richmond, BC, CANADA, V74 4V5
Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068

CONVERSIONS & REPAIRS

Gulf Coast Fabrication, Inc., P.O. Box 539, Lakeshore, MS 39558
Vancouver Shipyards, 50 Pemberton Ave., N. Vancouver, B.C. CANADA V7P 2R2

CONVEYOR BELT REPAIR

Kiehna Rubber Engineering, GERMANY
U.S. Rep: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168

CORROSION CONSULTANTS

S.G. Pinney & Assoc., P.O. Box 9220, Port St. Lucie, FL 34985

COUPLINGS

American Vulkan, P.O. Drawer 673, Winter Haven, FL 33882
Aquadrive Systems, Inc., 55 Olin St., Ocean Grove, NJ 07756
Holset Engineering, 1320 Kemper Meadow Drive, Cincinnati, OH 45240
Lo-Rez Vibration Control Ltd., 156 West 8th Avenue, Vancouver, BC
CANADA, V5Y1N2

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Mapeco Products, 90 Forest Avenue, P.O. Box 382, Locust Valley, NY 11580
Ovako Steel Inc., 1447 New Litchfield St., Torrington, CT 06790
Bisso Marine Co. P.O. Box 4113, New Orleans, LA 70178
Del Gavio Marine Hydraulics Inc., 619 Industrial Rd., Carlstadt, NJ 07072
Hagglunds Inc, Marine Div. Headq., 50 Chestnut Ridge Rd, Montvale, NJ 07645
Liebherr-Werk Nenzing GES.mbh, P.O. Box 10, A-6710 Nenzing, AUSTRIA
Macgregor USA 20 Chapin Rd., Pine Brook, NJ 07058
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454
J. D. Neuhaus Hebezeugue GmbH, D-5810 Witten, GERMANY
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
Petitbone-Tiffin Corp., 235 Miami St., Tiffin, OH 44883

CRANES

Amclyde Engineered Prod., 240 E Plato Blvd., Saint Paul, MN 551071609
Lakeshore, Inc., P.O. Box 809, Iron Mountain, MI 49801
Morgan Marine, 1300 Nomandy Place, Santa Ana, CA 92705
Palfinger Inc., 8040 Dorchester Rd., Niagara Falls, Ontario, CANADA L2E 6V6
Tech Crane Int'l., Inc., 61130 Timberbend Dr., Lacombe, LA 70445

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MacGregor-Navire Group, 34 Bedford Rd., Clapham North, London SW4 7HH
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
Skookum/Rope Master, P.O. Box 280, Hubbard, OR 97032
Smith Berger Marine Inc., 516 South Chicago Street, Seattle, WA 98108
Willem Pot b.v., P. O. Box 29102, 3001 GC Rotterdam, The Netherlands

DECK MACHINERY

Amclyde Engineered Prod., 240 E Plato Blvd., Saint Paul, MN 551071609

American Block Co. 6311 Breen Rd, Houston, TX 77086

Hawbolt Ind., Hwy 3, P.O. Box 80, Chester, Nova Scotia, CANADA BOJ 1JO

Lakeshore, Inc., PO Box 809, Iron Mountain, MI 49801

McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454

NEI Clarke Chapman Canada, 1075 N. Service Rd. W., Unit 4, Oakville, Ontario, CANADA L6M 2G2

New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150

Pusnes, PO Box 102, N-4818, Faervik, NORWAY

Skookum/Rope Master, P.O. Box 280, Hubbard, OR 97032

Smith Berger Marine Inc., 516 South Chicago St., Seattle, WA 98108

Waterman Supply Co., P.O. Box 596, Wilmington, CA 90748

DECK STRUCTURES/ CONTROL CABS

Carolina Cockpit PO Box 83037, Portland, OR 97283

DEGREASERS

Duratech Industries, 1371-3 Church St., Bohemia, NY 11716

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Rochem Separation Systems, P.O. Box 156, 54 Rue Agasse, 1211 Geneve 17 SWITZERLAND

Watermakers Inc., 2233 South Andrews Ave., Ft. Lauderdale, FL 33316

DEPTH SOUNDING EQUIPMENT

Innerspace Technology, Inc., 36 Industrial Dr., Waldwick, NJ 07463

DIESEL ACCESSORIES

General Thermodynamics Corp., 210 South Meadow Rd., P.O. Box 1105, Plymouth, MA 02360

Htatch & Kirk Inc., 601 McFartand Rd., Houston, TX 77011

Kiene Diesel Accessories, 325 S. Fairbanks St., P.O. Box 386, Addison, IL 60101

DIESEL ENGINE-Spare Parts & Repair

ABB Industry Oy, 100 Madison Corp. Park Rte.6, Brewster, NY 10509

Alaska Diesel, 4420 14th Ave., NW, Seattle, WA 98107

Caterpillar, Inc., Engine Div., P.O. Box 610, Mossville, IL 61552-0610

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

Diesel Engine & Parts Co., 8123 Hillsboro Ave., Houston, TX 77029

Electro-Motive Division-GMC, 9301 W. 55th St., LaGrange, IL 60525

Geiger Track Parts, P.O. Box 365, Watseka, IL 60970

Giro Engineering Ltd, Talisman, Duncan Road, Park Gate, South Hampton, S03 7BX ENGLAND

Goltens Worldwide, 160 Van Brant St., Brooklyn, NY 11231

Hatch & Kirk Inc., 601 McFartand Rd., Houston, TX 77011

MAN B&W Diesel AG, Stadtbachstrasse 1, D-86153 Augsburg 1, GERMANY

MAN B&W Diesel A/S, Center Syd, Stamholmen 161, DK-2650 Hvidovre, DENMARK

MAN B&W Diesel, 17 State St., New York, NY 10004

MTU of North America, 10450 Corporate Dr., Houston, TX 77478

Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, GERMANY

Motor-Service AB, Box 2115, S-144 04 Ronninge, SWEDEN

Motor Service-Hugo Stamp, 3190 S.W. 4th Ave., Ft. Lauderdale, FL 33315

New Sulzer Diesel, Inc. 200 Park Ave. New York, NY 10166

Ocean Power 571 Central avenue, New Providence, NJ 07974

Paxman Diesels, P.O. Box 8, Paxman Works, Colchester, Essex, C01 2HW, ENGLAND

Paxman Diesels USA, (A Div. of Ruston Gas Turbines, Inc.), 15950 Park Row, Houston, TX 77084

Ulstein Bergen AS, PO Box 924, N5002 Bergen, NORWAY

Wartsila Diesel, 201 Defense Highway, Annapolis, MD 21401

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

Muldoon Marine Services, Inc., P.O. Box 3221, Terminal Island, CA 90731

DOORS - MARINE & INDUSTRIAL

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Mapeco Walz & Krenzer, Inc., 90 Forest Ave., Locust Valley, NY 11560

Marine Accommodations Inc., 8535-3 Baymeadows Rd., Jacksonville, FL 32256

DRILLING & BLASTING

Marine Drilling & Blasting, PO Box 10455, Jacksonville, FL 32247-0455

DRY DOCKS-Design

Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381
North Florida Shipyards, P.O. Box 3255, Jacksonville, FL 32206

ELECTRICAL EQUIPMENT

L. F. Gaubert & Co., Inc., P. O. Box 50500, New Orleans LA 70150
MMC International, 60 Inip Dr, Inwood NY 11696

ELECTRICAL WIRE DEVICES

Meltric Corp., 1935 Ace World Wide Lane, Cudahy, WI 53110

ELECTRONIC CONTROLS

MCR Engineering, 206 Dedham St., Norfolk, MA 02056

ELECTRONIC DISPLAY

Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolboton, NORWAY

ELECTRONIC INFORMATION SUPPORT

Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolboton, NORWAY

EMERGENCY MEDICAL ASSISTANCE

International SOS Assistance, 8 Neshaminy Interplex, Ste., 207, Treviso, PA 19053

EMISSION CONTROLS

Haldor Topsøe Nymollevej 55, DK-2800, Lyngby, Denmark
Seaworthy Systems, Inc. P.O. Box 965, Essex, CT 06426

ENGINEERING SERVICES

MCR Engineering Co., Inc. 206 Dedham St., Norfolk, MA 02056
Seaworthy Systems, Inc. P.O. Box 965, Essex, CT 06426

ENGINE CONTROLS - SHIFT AND THROTTLE

Marine Systems, Inc., 1000 NW First Avenue, Bldg. 20, Boca Raton, FL 33432

ENGINE REPAIR

Marine Spares Int'l., 53 Richards St., Brooklyn, NY 11231

ENGINE ROOM LIGHTING

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ENGINE TEST EQUIPMENT

General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Rd., Plymouth, MA 02360
Instruments, Computers, & Controls, Inc., 6942 Haven Creek Dr., Katy, TX 77449

ENVIRONMENTAL SYSTEMS

Foss Environmental Services, 7440 West Marginal Way So., Seattle, WA 98108-4141
NWR, Inc., -Environmental Systems Division, Box 58626, Salt Lake City, UT 84158

EPIRBS

ACR Electronics, Inc., 5757 Ravenswood Rd., P.O. Box 5247, Ft. Lauderdale FL 33310-5247
Alden Electronics, 40 Washington St., Westborough, MA 01581

EQUIPMENT - Marine

Bohnet & Associates, 1150 Rue Rochelle, Slidell, LA 70458
Ocean Technical Services, Inc., 634 Peters Road, Harvey, LA 70058

EVAPORATORS

Alfa-Laval Separation, Inc., 955 Meams Rd., Warminster, PA 18974
Beaird Industries Inc., P.O. Box 31115, Shreveport, LA 71130
NEI Clarke Chapman Canada, 1075 N. Service Rd. W., Unit 4, Oakville, Ontario, CANADA L6M 2G2

EXPANSION JOINTS (RUBBER, METALLIC)

Archon Industries, 200 Williams Street, Portchester, NY 10573

FANS - VENTILATORS - BLOWERS

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 Marine Accommodations Inc., 8535-3 Baymeadows Rd., Se 140, Jacksonville, FL 32256
 Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031
 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 54241
 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
 Boston Whaler, Inc. Commercial Products Div., 1149 Hingham St, Rockland, MA, 02370
 Caley Ocean Systems, Mayor Avenue, East Kilbride, Scotland, G74 4PU
 Fr. Fassmer GMBH & Co., D-2876 Berne 2, Wese, GERMANY
 Norsafe AS, P.O. Box 115, N-4818 Faerвик, Norway
 Ocean Power 571 Central Avenue, New Providence, NJ 07974
 Willard Marine Co., Inc., 1250 N. Grove St., Anaheim, CA 92806
 Zodiac of North America, P.O. Box 400, Stevensville, MD 21666

LIFESAIVING EQUIPMENT
 Steams Manufacturing, P.O. Box 1498, St. Cloud, MN 56302

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
 ACR Electronics, Inc., 5757 Ravenswood Rd., P.O. Box 5247, Ft. Lauderdale, FL 33310-5247
 Lighting Supply Co., 2729 Second Ave., Seattle, WA 98121
 GfamoX, 44 Austin Street, P.O. Box 13522, St. John's, NF CANADA A1B 4B8
 Goltzen Marine, 160 Van Brunt St., Brooklyn, NY 11231
 Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
 Julian A. McDermott, 1639 Stephen St., Ridgewood, NY 11385
 Pauluhn Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearland, TX 77581
 Francis Searchlights/Siam Supply Co., 4415 6th N.W., Seattle, WA 98107

LINE BLINDS
 Stacey/Fetterolf, P.O. Box 103, Skippack, PA 19474

LIQUID LEVEL INDICATORS
 Metritape, P.O. Box 2366, Littleton, MA 01460
 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, P.O. Box 2366, Littleton, MA 01460
 Midland Mfg. Corp., 7733 Gross Point Rd., Skokie IL 60076-0226
 Setcor, 2 Dean St., Tenafly, NJ 07670

LOGISTICS
 Chand Corporation, 157 Hwy 654, Mathews, LA 70375
 QED, 4646 N. Witchduck Road, Virginia Beach, VA 23465
 V.L. Logistics Consultants, Inc., 3420 Bienville Blvd., Ocean Springs, MS 39564

LUBRICANTS
 Texaco, International, 2000 Westchester Avenue, White Plains NY 10650

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
 Del Gaudio, 619 Industrial Rd., Carlstadt, NJ 07072
 Goltzen Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231
 New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150

MACHINERY MONITOR AND CONTROL SYSTEMS
 Electronic Marine Sysytms, 800 Ferndale Pl., Mahway, NJ 07065

MARINE ACCOMMODATIONS
 Directions in Design Inc, 633 Emerson, Suite 100, St Louis, MO 63141
 Hopeman Brothers, P.O. Box 820, 435 Essex Ave., Waynesboro, VA 22980
 Jamestown Metal Marine Sates, Inc., 4710 Northwest Second Ave., Boca Raton, FL 33431
 Marine Accommodations Inc., 8535-3 Baymeadows Rd, Ste 140, Jacksonville, FL 32256
 Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031

MARINE BATTERIES
 Rae Storage Battery Mfg. Co. Inc., 51 Deming Rd., Berlin, CT 06037

MARINE CEILINGS
 The Gage Corp., 803 S. Black River St., Sparta, WI 54656
 Hydro-Aluminium, Vik Verk, N-5880 VIK I SOGN, Norway
 Marine Accommodations, Inc., 8535-3 Baymeadows Rd., Jacksonville, FL 32256

MARINE COATINGS
 Devco Coatings 4000 Dupont Circle, Louisville, KY 40207

MARINE ELECTRONICS
 Frank L. Beier Radio, 2001 Ridgelake Drive, Metairie, LA 70001
 Kockum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
 Saab Marine Electronics AB, Box 13045, 402 51 Goteborg, SWEDEN

MARINE ELEVATORS
 Alimak Elevator Co., 1100 Boston Ave., Bridgeport, CT 06601

MARINE ENGINEERS
 CDI Marine Co., 4040 Woodcock Dr., Suite 200, Jacksonville, FL 32207

MARINE FENDERS
 Viking Fender Co., 340 Lehigh Ave., Perth Amboy, NJ 08861

MARINE FIRE PROTECTION
 Hiller Systems, 3710 Lakeside Court, Mobile, AL 36693

MARINE FURNITURE
 Directions In Design, 633 Emerson, Ste. 100, St. Louis MO 63141
 Engineered Data Products, P.O. Box 565, Woodbury, NJ 08906-7565
 Jamestown Metal Marine Sales, Inc., 4710 NW Second Ave., Boca Raton, FL 33431
 Marine Accommodations Inc., 8535-3 Baymeadows Rd, Ste 140, Jacksonville, FL 32256
 Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031

MARINE GEARS
 Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati, OH 45227

MARINE HARDWARE
 HMS Hardware, 333 W. Merrick Rd., Valley Stream, NY 11580
 Marine Accommodations Inc., 8535-3 Baymeadows Rd., Jacksonville, FL 32256

MARINE INSURANCE
 John G. Alden, 1300 SE 17th St., Fort Lauderdale, FL 33316

MARINE INTERIORS
 Johnson Construction Specialties, Inc., 3420 Rusk P.O. Box 1360 Houston Texas 77251

MARINE PLUMBING
 Bill Brown Enterprises, Inc., 4995 Ocean Pines, Berlin, MD 21811

MARINE PROPULSION
 Schottel -Werft, D-56322 Spay/Rhein GERMANY

MARINE PUMPS
 Gilkes Inc., P.O. Box 628, Seabrook, TX 77586

MARINE SHIP MANAGEMENT
 BarbaArkhn, 1810 Chapel Ave. West, Cherry Hill, NJ 08002

MARINE SURPLUS SALES
 Defense Reutilization & Marketing Service, 2163 Airways Blvd., Memphis, TN 38114

METAL PRODUCTS
 Engineered Data Products, P.O. Box 565, Woodbury, NJ 08906-7565

MONITOR CONTROL ALARM
 Tracor Marcon, 800 Ferndale Pl., Rahway, NJ 07065

MULTI-CABLE PENETRATION DEVICE
 NMP, 12437 E. 60th St., Tulsa, OK 74153

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
 Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Hwy., Arlington, VA 22202
 CDI Marine Co., 4040 Woodcock Dr., Suite 200, Jacksonville, FL 32207
 Childs Engineering Corp., Box 333, Medfield, MA 02052
 Crandall Dry Dock Engrs, Inc., 21 Pottely Ln., Dedham, MA 02026
 Crane Consultants, 15301 First Ave S., Seattle WA 98148
 C.R. Cushing, 18 Vesey St., New York, NY 10007
 Arthur D. Darden, 3200 Ridgelake Dr., Suite 403, Metairie LA 70002
 DeJong & Lebel, Inc., 1734 Emerson Street, Jacksonville, FL 32207
 Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
 Diversified Technologies, 812 Live Oak Dr., Chesapeake VA 23320
 Encon Mgmt. & Engineering Consultant Seivces, P.O. Box 7760, Beaumont, TX 77706
 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., 66 Long Wharf, Boston, MA 02110
 The Glosten Assoc. Inc., 600 Mutual Life Bldg., 605 First Ave., Seattle, WA 98104
 Guido Perla & Assoc., 4039 21st Ave., Ste. 300, Seattle, WA 98199
 Morris Rundnick Associates, Inc., 130 Sutter St., Ste. 400, San Francisco, CA 94104
 C. Raymond Hunt Associates, 69 Long Wharf, Boston MA 02110
 Hydrocomp, Inc., 45 James Farm-Lee, P.O. Box 865, Durham, NH 03824
 JH Inc., No. 4 Executive Campus, Culbert Blvd. & Route 70, P.O. Box 5031, Cherry Hill, NJ 08034
 R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
 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., 226 Chestnut St., Roselle Park, NJ 07204
 Marine Management Systems Inc., 102 Hamilton Ave., Stamford CT 06902
 Marine Power Associates, 1010 Turquoise St., Ste 217, San Diego, CA 92109
 Marifech, Seacitf, 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
 QED Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455
 M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 620 Fulsom St., Ste. 301, San Francisco, CA 94107
 Sargent & Herkes, 225 Baronne St., Suite 1405, New Orleans LA 70112
 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; 2 Skyline Pl., 5203 Leesburg Pike, Suite 700, Falls Church, VA 22041;
 50 Vashell Way, Orinda, CA 94563
 George G. Sharp, Inc., 100 Church St., New York, NY 10007
 R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
 TIMSCO, P. O. Box 91360, Mobile AL 36691

NAVIGATION & COMMUNICATIONS EQUIPMENT
 American Radio Corp., 914 164th St. S.E. B-1698, Mill Creek, WA 98012
 AT&T, High Seas Dept., 412 Kemble Ave., Room C380, Morristown, NJ 07960
 Autronica Marine A/S, Drammensveien 126, N-0277 Oslo 2, NORWAY
 CAST, Inc., 5450 Katella Ave., Los Alamitos, CA 90720
 Celinnet Corp, 400 Main St, Stamford, CT 06901-3004
 ComNav Marine Ltd., 1420 Frances St., Vancouver, BC, CANADA V5L 1Y9
 Comsat Maritime Services, 950 L'Enfant Plaza SW, Washington DC 20024
 Electronic Marine Systems, 800 Ferndale PL., Rahway, NJ 07065
 Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
 Hose-McCann, 1241 W. Newport Center Dr., Deerfield Beach, FL 33442
 ICS Electronics Ltd., Unit V, Rudford Industrial Estate, Ford, Arundel, West Essex, UK
 IDB Mobile Communications, 1828 L Street NW, Suite 660, Washington, D.C. 20036
 Mackay Communications, 300 Columbus Circle, Edison, NJ 08837
 Marine Electric RPD, Inc., 50 Carol St., P.O. Box 1135, Clifton, NJ 07014-1135
 Matrix Technologies, Inc., 342 Pennywell Rd., St. Johns, N.F., CANADA A1C 5J2
 Megapulse, Inc., 8 Preston Court, Bedford MA 01730-2380
 Negron Marine Consultants, 840 Bond Street, Elizabeth, NJ 07201
 Norwegian Telecom, P.O. Box 6701, Oslo 1, NORWAY
 Offshore Systems Intl., 19015 36th Ave., W., Ste. BC, Bldg. F, Lynnwood, WA 98036
 Pauluhn Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearland, TX 77581
 RD Instruments, 9855 Businesspark Ave., San Diego, CA 92131
 Raytheon Marine Co, 46 River Road, Hudson, NH 03051
 SPD Technologies, 13500 Roosevelt Blvd., Philadelphia, PA 19116
 Scandinavian Micro Systems P.O. Box 155, N-1411, Kolboten, NORWAY
 Simrad, 19210 33rd Avenue West, Lynnwood, WA 98036
 Simrad Robertson, 10801 Hammerly, Suite 100, Houston, TX 77043-1923
 Sound Propeller, 1608 Fairview Ave. E., Seattle, WA 98102
 Sperry Marine Inc., 1070 Seminole Trail, Charlottesville VA 22901
 Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
 Summer Equipment Ltd., 24 West 4th Ave., Vancouver V5Y 1G3, CANADA
 Trimble Navigation, 585 North Mary Avenue, P.O. Box 3642, Sunnyvale, CA 94086
 Waterway Communications System, Inc. 453 E. Park Pl., Jeffersonville, IN 47130

OIL—Marine—Additives
 Mobil Oil Corporation, 3225 Gallows Road, Fairfax, VA 22037-0001
 Texaco, International, 2000 Westchester Avenue, White Plains NY 10650

OIL SPILL CONTAINMENT
 Foss Environmental, 7440 W. Marginal Way S., Seattle, WA 98108-4141

OIL SPILL KIT
 First Northern Environmental, Inc. 32 Brill St., Newark, NJ 07105
 Haz-Mat Response tech. 5841 Box Canyon Rd., LaJolla, CA 92307

OIL SPILL RESPONSE MANAGEMENT SERVICES
 Gallagher Marine Systems 1020 N. Fairfax St., Alexandria, VA 22314

OIL/WATTFI SEPARATORS
ACS Industries 17211 Industry Rd., Houston TX 77275
 Alfa-Laval Separation, Inc., 955Mearns Rd., Warminster, PA 18974-0556
 Blohm & Voss AG, P.O. Box 10 07 20, D-2000 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
 MMC International, 60 Inp Dr, Inwood NY 11696
 National Fluid Separators, 827 Hanley Industrial Ct., St. Louis, MO 63144
 Nelson Industries, Highway 51 West, Stoughton, WI 53589
 Ocean Power 571 Central Avenue, New Providence, NJ 07974

PAINT-COATING-CORROSION CONTROL
 The Arnessen Corp., Corrosion Dynamics Div., 1100 Walnut St., Rosell, NJ 07203
 Corroreal, Inc., 1045 12th Ave. NW-F5A, Issaquah, WA 98027
 Esgard, Inc., P.O. Drawer 2898, Lafayette, LA 70502
 Jamestown Distrib., 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835
 Hempel Coatings, Foot of Curie Avenue, Wallington, NJ 07057
 Microphor, Inc., Marine Div, 452 E. Hill Rd, P.O. Box 1460, Willits, CA 95490
 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
 UT Technologies Ltd, Box 31114, Robie St. RPO, Halifax Nova Scotia Canada B3K5T9
 Vecom USA, 236 St. George Avenue, Jefferson, LA 70121

PAINT REMOVAL
 White Metals, Inc. 6300 Midvale, Houston, TX 77087

PIPE FITTINGS/CONNECTING SYSTEMS
 Lokring Corp, 396 Hatch Drive, Foster City, CA 94404

POLLUTION CONTROL PRODUCTS/ MARINE/SERVICES
 Foss Environmental, 7440 W. Marginal Way S., Seattle, WA 98108-4141
 Gallagher Marine Services 1020 N. Fairfax St, Alexandria, VA 22314
 Haz-Mat Response Tech. 5841 Box Canyon Rd, LaJolla, CA 92307
 Oil Mop, Inc, 221 Rue De Jean, Lafayette, LA 70508

POLLUTION PACKER COMPACTORS
 TFC Corporation, 77415 Cahill Rd, Minneapolis, MN 55439

POLLUTION RESPONSE COURSE
 Compliance system, Inc, 26 east Bryan St, Savannah, GA 31401

PORT SERVICES
 Port of Portland, 5555 N. Channel Ave, Portland, OR 97217

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, Metarie, 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
 Fincantieri, Diesel Engines Div—GMT, Bagnoli delta Rosandra 334, Trieste, ITALY
 GE Naval & Drive Turbine Systems, 166 Boulder Dr, Fitchburg MA 01420
 Holsel Engineering, Inc, 1320 Kemper Meadow, Ste. 500, Cincinnati, OH 45240
 Kahlenberg Bros. Co, P.O. Box 358, Two Rivers, WI 54241
 Krupp MaK, 7555 Danbro Crescent, Mississauga, Ontario, CANADA L5N 6P9
 Kobelt Manufacturing, 11720 Horseshoe Way, Richmond, BC Canada V7A 4V5
 LIPS B.V., P.O. Box 6, 5151 RP Drunen, The Netherlands
 LIPS U.S.A. Inc, 3617 Koppens Way, Chesapeake, VA 23323
 Lohmann & Stolterfoht, P.O. Box 1860, D-58408 Witten, Germany
 Mapeco Products Inc, 90 Forest Ave, Locust Valley, N.Y. 11560
 Markisches Werk, P.O. Box 1442, D-5884 Halver GERMANY
 MAN B&W Diesel, 17 Slate 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
 Mathers Controls, 675 Pease Rd, Burlington, WA 98107
 MTU of N.A., 10450 Corporate Dr, Sugar Land, TX 77478
 New Sulzer Diesel, Ltd, CH-8401, Winterthur, SWITZERLAND
 North American Marine Jet, P.O. Box 1232, Benton, AR 72015
 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

Karl Senner Inc., 25 W Third, Kenner LA 70062
 Schottel-Werft, Manizer Strasse 99, D-56322 Spay/Rhein, GERMANY
 Schottel North America, Inc, 1505 Corbin Ave, Hammond, LA 70403
 Siemens Electric Ltd, 1180 Courtneypark Rd., Mississauga, ONTARIO
 Sound Propellers, 1608 Fairview Ave. E., Seattle, WA 98102
 Stewart & Stevenson, 1400 Destrehan, P.O. Box 8, Harvey LA 70059-0008
 Thrustmaster of Texas, 12227-K FM 529, Houston, TX 77041
 Ulstein Bergen Diesel A/S, P.O. Box 924, N-5002, Bergen, NORWAY
 J. M. Voith GmbH, Marine Division, Postfach 1940, D-7920, Heidenheim/Brenz, 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, SF65100 Vasa, FINLAND

PUMP-LIFEBOAT (hand operated)
 Beckson, P.O. Box 3336, Bridgeport, CT 06605

PUMP—Repair—Drives
 Allweiler Marine Inc, USA Rep, 14812 S.E. 62nd court, Bellevue, WA 98006
 Allweiler Marine Inc, Postboks 149,1351 rd, NORWAY
 Del Gaudio, 619 Industrial Rd, Carlstadt, NJ 07072
 Frank Mohn Houston, Inc, P.O. Box 1586, La Porte, TX 77572-1586
 Gilkes, Inc., PO Box 628, Seabrook, TX 77586
 Jim's Pump Repair, 48-55 36th St., Long Island City NY 11101
 Jerry B. Leach Co, Box 71, 647 Stale Rd, Cheraw, SC 29520
 Leistriz Corporation, 165 Chestnut Street, Allendale, NJ 07401
 Vita Motivator, 99 W Hawthorne Ave, Suite 622, Valley Stream NY 11580

REMOTE VALVE OPERATORS
 ELLIOTT MANUFACTURING, P.O. BOX 773, BINGHAMTON, NY 13902

RESISTANCE TAPE
 Metritape, P.O. Box 2366, Littleton, MA 01460

REFRIGERATION EQUIPMENT/SERVICES
 Adrick Marine, 141D, Central Ave., Farmingdale, NY 11735
 Bailey Refrigeration Co., 2323 Randolph Ave, Avenel, NJ 07001
 Vecom Refrigeration USA, 3913 Hartzdale Dr, Camp Hill, PA 17011

REMOTE VALVE OPERATORS
 American United Marine Corp, 5 Broadway, Rt 1, Saugus, MA 01906
 Teleflex, Inc, 771 First Ave, King of Prussia, PA 19406

RIGIN INFLATABLE BOATS
 American Eagle, 780 E. Pearle Jensen Way, LaConner, WA 98257

ROPE—Manila—Nylon—Hawser—Fibers
 Allied Signal Inc, Fibers Division, 1411 Broadway, New York, NY 10018

RUDDER STOCK SEALS
 Blohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1, GERMANY
 U.S.A. Reps: Simplex Turmar Inc, P.O. Box 168, Little Neck, NY 11363-0168
 John Crane Marine USA, 1536 Barclay Blvd., Buffalo Grove, IL 60089

SAFETY LIGHTING
 Datrex, Inc, P.O. Box 1150, Kinder, LA 70648-1150

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
 Microphor, Inc, 452 E. Hill Rd, P.O. Box 1460, Willits, CA 95490
 Ocean Power 571 Central Avenue, New Providence, NJ 07974

SATELLITE COMMUNICATIONS
 British Telecom, Room 203, 43 Bartholomew Close, London EC1A 7HP
 Comsat Mobile Communications, 22300 Comsat Dr, Clarksburg, MD 20871-9475
 IDB Mobile, 10525 W. Washington Blvd., Culver City, CA 90232
 Norwegian Telecom, Postboks 6701 St. Olavs Plass, N-0130, Oslo, Norway
 Singapore Telecom, 15 Hill Street, Telephone House, 2nd storey, Singapore 0617

SCALE MODELS
 Markitec, 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

SCUTTLES/MANHOLES
 L.S. Baier & Assoc, 7527 NE 33rd Dr, Portland, OR 97211

SEALANTS
 Boatlife, Inc., Div. of Life Ind, 205 Sweet Hollow Rd, Old Bethpage, NY 11804

SEALS
 John Crane Marine USA, 1536 Barclay Blvd., Buffalo Grove, IL 60089

SELF UNLOADING SYSTEM REPAIR
 Kiehma Rubber Engineering, GERMANY
 U.S. Rep: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168

SHIP REPAIR
 Goltens Marine Company, 160 Van Brunt St., Brooklyn, NY 11231

SHIPBOARD CABLE
 NMP Corp, P.O. Box 35493, Tulsa, OK 74153-0493

SHIPBOARD COMMUNICATIONS
 Hose-McCann, 1241 West New Newport Center, Deerfield Beach, FL 33442

SHIPBUILDING EQUIPMENT
 NEI Syncrolift, Inc, 8970 S W 87th Ct, Miami FL 33176

SHIPBUILDING—Repairs, Maintenance, Drydocking
 Astilleros Espanoles S.A., Padilla 17, 28006 Madrid, 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
 Boston Whaler, Inc, Commercial Products Div, 1149 Hingham St., Rockland, MA 02370
 Caridoc, P.O. Box 1147 Port Of Spain, Trinidad, W.I.
 Chris-Marine AB, P.O. Box 9025, S-2000 39, Malmo, SWEDEN
 Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381
 Fincantieri SpA Cantieri Navali Italiani, Via Cipri 11, 16129 Genoa ITALY
 G.M.D. Shipyard, PO Box 050221, Brooklyn, NY 11205
 Gold Coast Yachts, Inc, Box 1980 Kingshill, St. Croix, U.S.V.I. 00851
 Goltens Marine Company, 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
 Hall Buck Marine, P.O. Box 35, Baton Rouge, LA 70816
 Hitachi Zosen, Hitachi Shipbuilding & Engineering Co., 1-1-1 Hitotsubashi Chiyoda-Ku Tokyo 100 Japan
 Hike Metal Products & Shipbuilding, Box 698, Wheatly, Ont, Canada NOP 2P0
 Hyundai Heavy Ind, 1 Cheonha-dong, Dong Ku, Ulsan, Korea
 IHI, Tokyo Chuo Bldg, 6-2, Chiyoda Tokyo 100 Japan
 Intermarine (USA), Inc, 301 N. Lathrop Ave, Savannah, GA 31402
 Jacksonville, Shipyards, 750 E. Bay St, Jacksonville, FL 32202
 Jeffboat, Inc, P.O. Box 610, Jeffersonville IN 47130
 Kvaerner Masa-Yards Oy, Box 132, SF-00151, Helsinki, FINLAND
 Kvichak Marine, 615 N 34th St, Seattle, WA 98103
 Leevac Shipyards, P.O.Box 1190, HWY 90 East, Jennings, LA 70546
 Lisnav, Apartado 2138, 1103 Lisbon, Codex PORTUGAL
 Marco, Inc, 2300 W Commodore Way, Seattle, WA 98199
 Motor-Service AB, Box 2115, 144 04 Ronninge, SWEDEN
 Munson Manufacturing, 150 West Dayton, Edmonds WA 98020
 Newport News Shipbuilding, 4101 Washington Ave, Newport News, VA 23607
 Nichols Brothers Boat Builders, 5400 South Cameron Rd, FreeLand, WA 98249
 North Florida Shipyard, Inc, P.O. Box 3255, Jacksonville, FL 32206
 Peterson Builders, Inc, 101 Pennsylvania Ave, Sturgeon Bay, WI 54235-0650
 PDT, 750 Middle Ground Blvd., Newport News, VA 23606-2528
 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 AB 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
 Westport Shipyard, P.O. Box 308, Westport, WA 98595
 WillardMarine, inc., 1250 N. Grove St., Anaheim, CA 92806
 Zidell Marine Corp, 3121 S.W. Moody Street, Portland, OR 97201
 Zodiac of North America Inc, Thompson Creek Rd, P.O. Box 400, Stevensville, MD 21266

SHIPYARD / CABLES
 Amercable, 350 Bailey Road, El Dorado, AR
 Ocean Technical Services 634 Peters Road, Harvey, LA 70058
 T.A.S.T. Corp. PO Box 10392, Fairfield, NJ 07004

SIGHTGLASSES
 Archon Industries, 200 Williams Street, Portchester, NY 10573

SIMULATOR TRAINING

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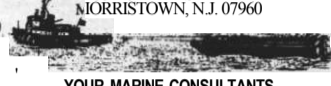
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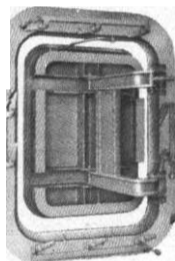
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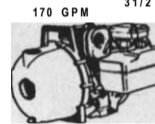
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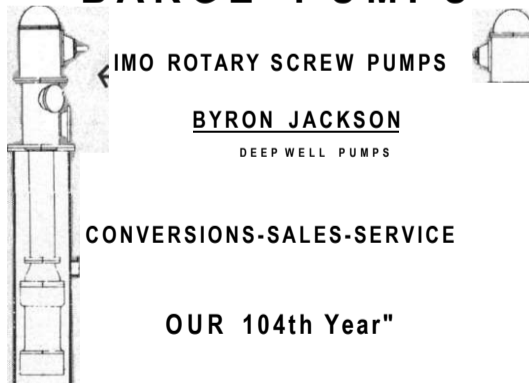
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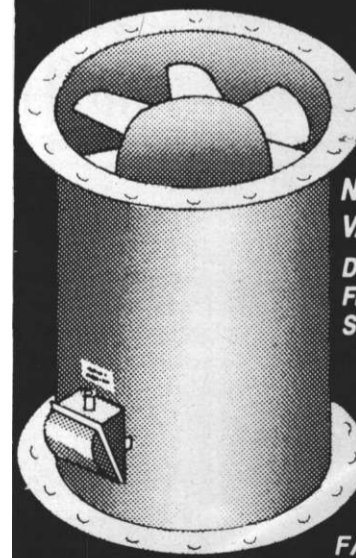
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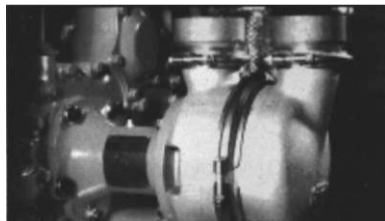
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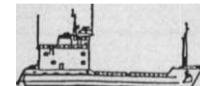
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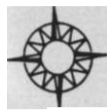
The US Department of Transportation's Maritime Administration (MARAD) is seeking firms to assist and provide required analysis of applications for loan guarantees of shipbuilding and ship conversion projects in US shipyards by domestic and foreign firms, under the National Shipbuilding and Shipyard Conversion Act of 1993. Specifically, Title XI. Firms should offer specific experience and expertise in one or more of the following fields.

- Economic analysis to include but not be limited to the potential profitability of the work the ship is to perform in the relevant country. Risk assessment of political and monetary stability, risk of expropriation, credit evaluations, and banking relationships of firms in relevant countries.
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Based on the responses received from this announcement, companies will be sent an application to become an "Expert Service Agent" for the identified Title XI work. After analysis of the application, agreements will be issued to companies who can provide the analysis in accordance with the application criteria. Subsequently, MARAD will award tasks to specific companies based on the company's ability to perform one or more of the assigned tasks within specified time constraints.

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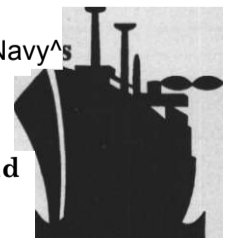
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