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JANUARY 1999

Great Boats of 1998

Tanker Technology

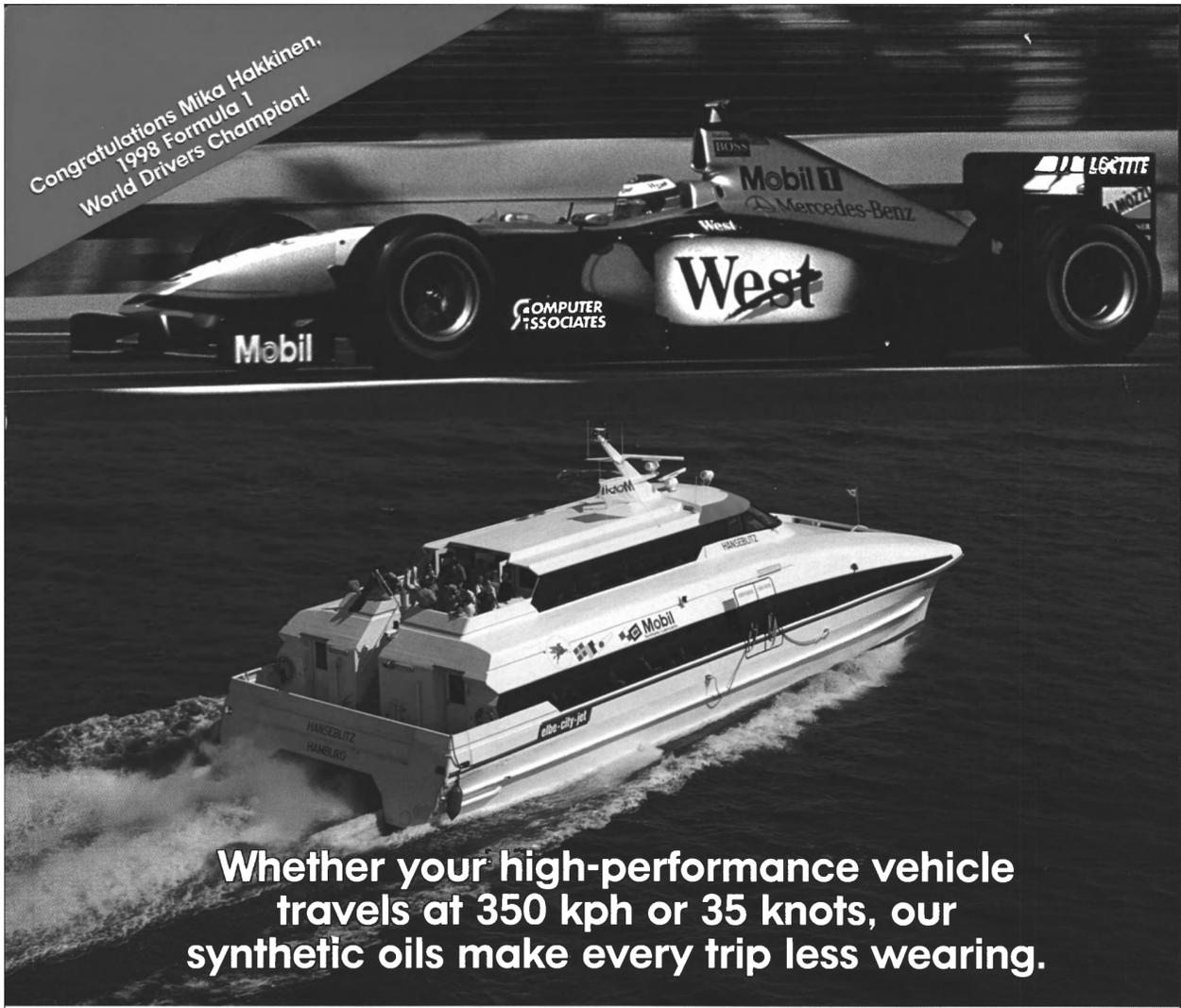
*New Chevron VLCC embodies latest
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Getting De-Bugged

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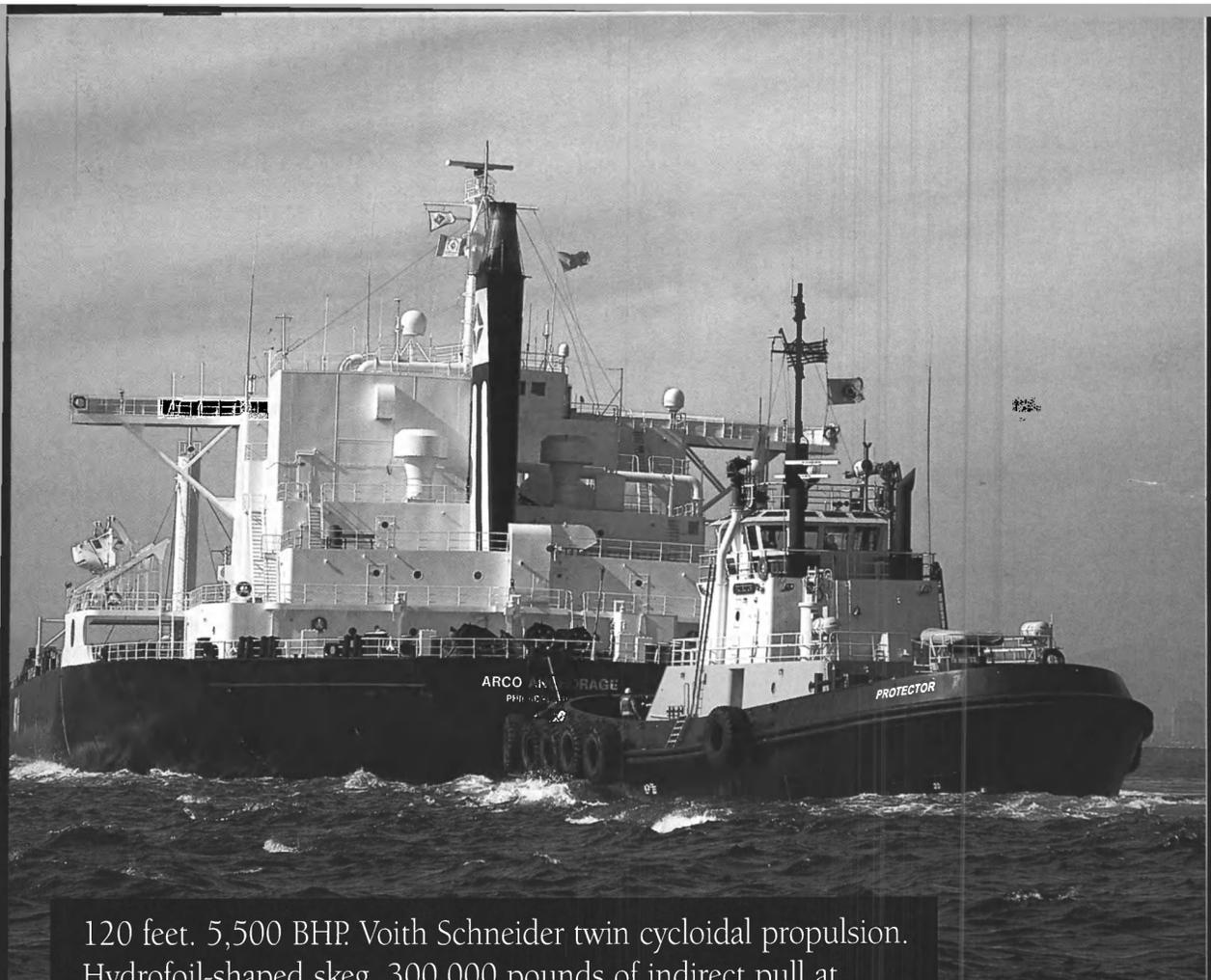


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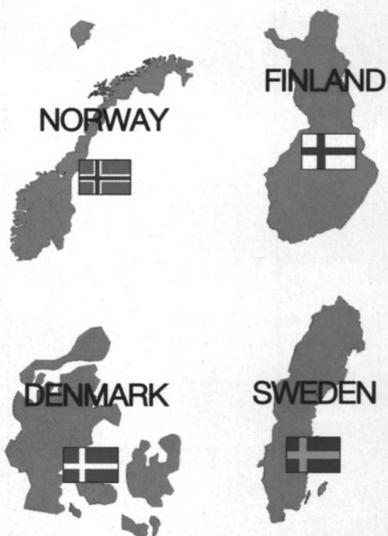


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MARITIME REPORTER AND ENGINEERING NEWS

ISSN-0025-3448
USPS-016-750

No. 1

Vol. 61

Founder: John J. O'Malley 1905 - 1980

118 East 25th Street
New York, NY 10010
(212) 477-6700

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Maritime Reporter/Engineering News is published monthly by Maritime Activity Reports, Inc. Mailed at Periodicals Postage Rates at Waterbury, CT 06701 and additional mailing offices.

Postmaster send notification (Form 3579) regarding undeliverable magazines to Maritime Reporter/Engineering News, 118 East 25th Street, New York, NY 10010.

Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement No. 0970700. Printed in U.S.A.

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Pictured on this month's cover is IRIS 6.1, a modular passenger catamaran which is the result of four years of testing and experimenting. The catamaran, both hulls and modules, is built of GRP Sandwich materials, which is designed to minimize weight while maximizing performance and stability. This year's selection of Great Boats starts on page 32.

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GREAT BOATS OF 1998

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& ENGINEERING NEWS

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EDITOR'S NOTE

Technology's role in the improvement of vessel design, building, outfitting and operation is a regular topic within our pages. However, a seemingly unrelated news clip which found its way to my desktop and into the pages of *MR/EN* sister publication *Maritime Week* gives perspective to burgeoning technologies — or perhaps more accurately, the correct and prudent use of new technology in conjunction with common sense.



It seems that a German motorist relied too heavily on his vehicle's satellite-guided navigation system, and obediently used the system to drive his BMW past a stop sign, down a ferry ramp and straight into the Havel River in eastern Germany. Police reports indicated that the driver was following the navigation system, which had evidently failed to note that the road in the town of Caputh near Potsdam ended at a ferry crossing. (Incidentally, the driver and his passenger were reportedly not injured.)

While the above scenario is not directly marine-related (unless, of course, you count the automobile as a quasi-ferry for its eventful 12-ft. foray into the river), it should raise a red flag or two. First, and most obviously, it must be stressed that reliance on technology must be balanced with traditional seamanship. Second, proper training and proven competency is tantamount to the ultimate success of *any* new product or system. The International Maritime Organization (IMO) has relentlessly pushed the "human factor" issues the past few years, and its sub-committee on Standards of Training and Watchkeeping (STW) is set to convene again at the end of this month. On the more immediate, "real world" level, pioneering training techniques for tanker safety are being practiced by a consortium including ARCO, Crowley Marine and Marine Safety International. Coverage of this group's efforts is included in this month's Ship & Boatbuilding Technology section, starting on page 18.

The handling of the Y2K Bug and its potential problems — both shoreside and onboard vessels — will continue to be the year's biggest technology story. The most troubling aspect of "the bug" is the unknown, as it seems nearly impossible to accurately gauge the breadth and depth of problems to come. "Y2K: The Truth & Consequences," which starts on page 24, attempts to put the problem in perspective.

Gregory R. Hawthorn

Coming Up In MR/EN in 1999

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April 1999
International Offshore Annual
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The BUSINESS of SAFETY

GL Leads The Way Toward Bigger, Better Ships



by David Tinsley,
technical editor

Germany has a modern tradition of backing and fostering collaborative research programs aimed at strengthening national competitiveness in maritime technology and operating practice.

As has been demonstrated in earlier years by the Schiff der Zukunft (Ship of the Future) and SHOPSY (Ship Operating System) initiatives, very clear and tangible industrial benefits have accrued from a characteristically German, pragmatic approach involving a broad swath of collaborators and federal sponsorship.

The value of such cooperation between specialists, encouraged by federal sponsorship, has been reaffirmed by a recently completed, three-year study program focused on drastically cutting harmful exhaust emissions from marine diesel engines. The technical challenge has been all the greater for the requirement to achieve substantial cuts in the production of polluting exhaust gases without sacrificing fuel efficiency.

The positive results of the joint exercise, dubbed CLEAN (clean and low soot engine, with advanced techniques for nitrogen oxide reduction), bode well for a follow-up project, CLEAN II.

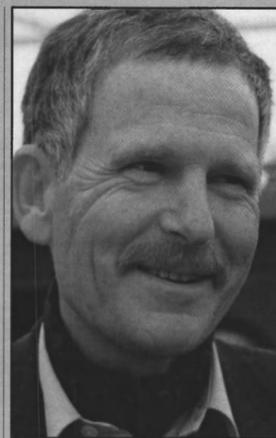
The commissioning by classification society Germanischer Lloyd (GL) of an entirely redesigned,

analysis and measurement laboratory at its Hamburg premises has to a large extent been an outcome of the cooperation fostered under the collaborative program. It provides Germany with a facility that can meet pressing international and national requirements for precisely determining exhaust emissions.

In addition, the investment in the laboratory is apposite to the growing requirement for engine designs to incorporate complex management systems, whose development and assessment would be impossible without resorting to state-of-the-art measurement technology.

CLEAN was implemented under the project management of GL, and involved a range of companies including all leading German marine engine manufacturers, specialized equipment makers, ship operator TT-Linie, and the Association for Research into Combustion Engines (FVV). Other firms, research institutes and universities were engaged on a sub-contract basis for particular tasks.

With the financial support of the Federal Ministry for Education, Science, Research and Technology (BMBF), the overall object of the three-year project was to demonstrate the potential for reducing emissions, by means both of test-



Ship classification society Germanischer Lloyd contends that no obstacles stand in the way of the construction of 8,000-TEU container carriers, and the society believes that ships of 15,000-TEU could be a reality in little more than a decade. The main constraints, according to Hans G. Payer, a Member of GL's Executive Boards, will be port and logistical factors.

bed analyses and measurements conducted aboard ship in a service environment, applying the requisite calculation techniques. It sought to determine whether and under what conditions electronically controlled injection systems for preventing nitrogen oxide (NOx) generation could be implemented, together with catalytic reactors for the after-treatment of the exhaust gas during normal operation, in an effective way without increasing fuel consumption.

BMBF is understood to be well-disposed towards a CLEAN II follow-up program, for which the central theme would be the consideration of the transient soot and particle emissions from marine diesels. The latest measurement devices and systems as employed in the Hamburg laboratory are vital to such areas of investigation.

The Federal Ministry of Transport has provisionally entrusted GL with the certification of marine diesel machinery in anticipation of the need for Engine International Air Pollution

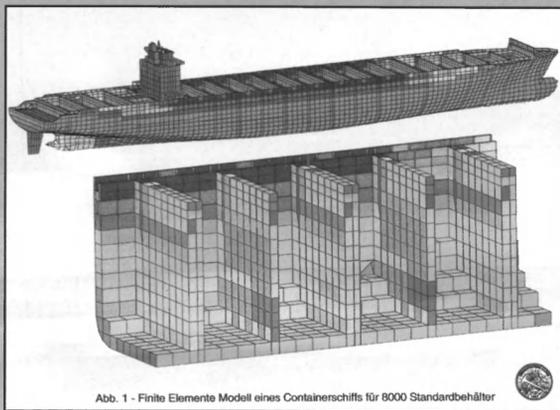


Abb. 1 - Finite Elemente Modell eines Containerschiffs für 8000 Standardbehälter



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Prevention Certificates (EIAPPs) under IMO Marpol's Annex VI edicts. The society has already undertaken such accreditation work involving various groups of engines at manufacturers' premises as well as single engines.

The technology encompassed by the laboratory at Hamburg also enables GL to undertake post-installation verifications aboard ship, as may be required by national authorities. Swedish requirements, for instance, are comparable to those of the IMO Code, but call for a load point at 75-percent output to be investigated for each engine.

While prolongation of studies under a CLEAN II framework would take the analysis of particulates in emissions a stage further, initial investigations into this area have already been conducted by the project participants. A custom-built measurement system, incorporating a micro-diluent device for collecting particles, has been developed for mobile use aboard ship. Filters containing emission particles are then transferred to GL's premises for weighing and analysis of the contents.

The long-term industrial significance of the CLEAN initiative lies in the fact that German engine manufacturers and licensors account for around half of all diesel propulsion machinery at sea. GL is unequivocal in its commitment to research and development (R&D), as manifested in its participation in around 50 projects during each of the past couple of years. It

played an important role in the administration of SHOPSY, which broke new ground in its integrated approach to ship technology over the 1991-96 program period.

Scale economies to hold sway?

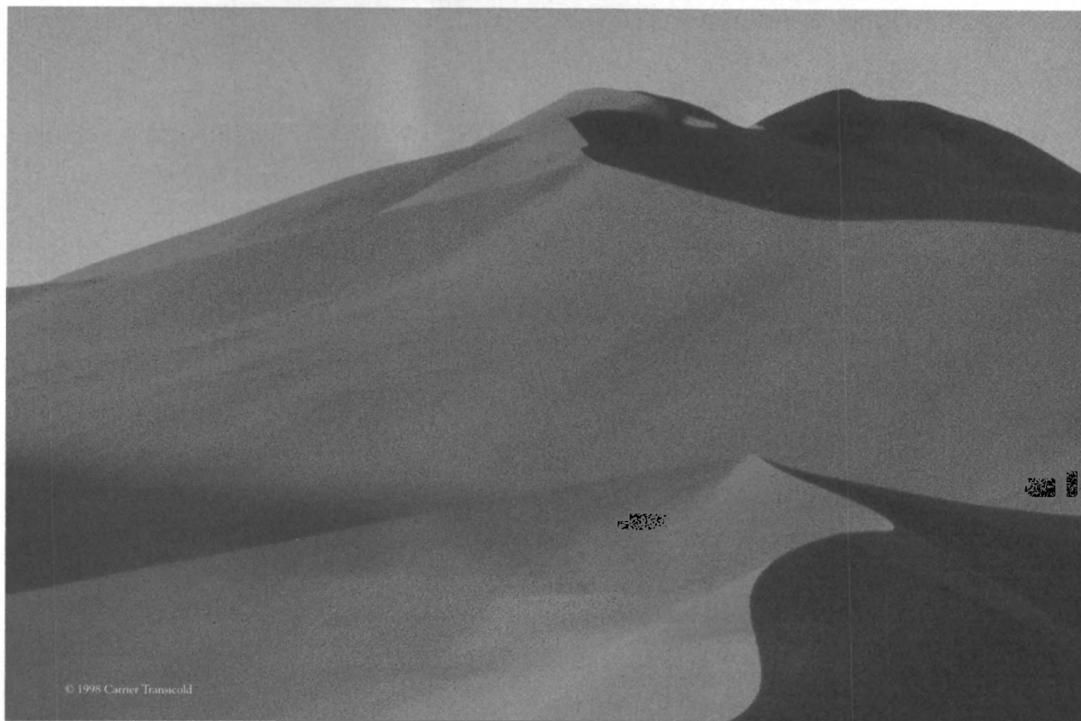
Despite current agonizing over the Asian crisis and concerns within the global shipowning community over the extent of the boxship newbuilding backlog, market analysts predict that seaborne container traffic will double in the decade to 2006. As a result of the boom in containership newbuilding investment, a surfeit of boxship tonnage has hit freight rates in many trades. Germanischer Lloyd calculates that container vessels with a total carrying capacity of around 500,000-TEU entered the market in 1997, against a current, annual demand for slot growth of about 300,000-TEU per year. However, the society believes that steady growth in container transportation volume, given the mode's domination of world traffic in finished goods and semi-finished products, will rapidly absorb present over-capacity. Further, it feels that demand could again outstrip supply within the next two to three years. "So far, not many containerships have been scrapped, but some 450 ships of about nine million dwt are expected to be removed due to over-age in the next 10 years, while some vessels may become obsolete by size," observed **Hans G. Payer**, a Member of GL's Executive Board.

No technical obstacles stand in the way of the construction of 8,000-TEU container carriers, on structural or powering grounds, in GL's view, and the society believes that ships of 15,000-TEU could be a reality in little more than a decade. The main constraints on the development of such leviathans for the liner trades will be port and logistical factors, considers Dr. Payer. He envisages a hull envelope of some 400-m length overall and 69-m beam, and yet a draught of little more than 14-m, for a 15,000-TEU intake.

While Danish operator A P Moller has moved the industry closer to the symbolically-important 8,000-TEU mark with its S-class vessels, thought to be able to carry more than 7,000-TEU, a German consortium headed by shipbuilder HDW has formulated an 8,000-TEU design proposal. GL has taken an active part in the project by performing detailed calculations concerning the design and dimensions of the structures.

"The results showed that it is indeed possible to cope with the structural problems of a ship of that size," confirmed Dr. Hans Payer.

In November, GL quantified the world container fleet as 2,288 vessels of 49 million gt, of which the society had a 31 percent classification market share, by ship numbers, and 25 percent by tonnage. It had been assigned classification responsibilities for 47 percent of the 262 pure containerships on order at that time.



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Congress Gets Tough on Substandard Vessels

by Arthur Dimopoulos

On November 13, 1998, the President signed the Coast Guard Authorization Act of 1998 (P.L. 105-383). Section 408 of Title IV of the Act provides the U.S. Coast Guard with new enforcement authority that has far-reaching impact on all federal agencies.

Effective January 1, 1999, owners and operators of vessels that are deemed to be substandard, i.e., in violation of an international safety convention to which the United States is a party, may be banned for a period of one year from carrying any U.S. government-impelled cargoes. The term "government-impelled cargo" includes "cargo for which a Federal agency contracts directly for shipping by water or for which (or the freight of which) a Federal agency provides financing, including

financing by grant, loan, or loan guarantee, resulting in shipment of the cargo by water." The broad language affects carriers of U.S. Agency for International Development cargoes (P.L. 480), Ex-Im Bank financed cargoes and all cargo preference type of cargoes.

The Secretary of Transportation through delegation vests the Coast Guard with the authority to determine whether a detained vessel is substandard. If the Coast Guard publishes notice of the detention and determination in electronic form, including the name of the vessel and its owner, the vessel may not carry government-impelled cargoes for a period of one year. Moreover, if an operator of a vessel has on more than one occasion had a vessel detained and

determined to be substandard, by virtue of the owners' track record, any vessel the operator prospectively has under his control may be banned from carrying government-impelled cargoes for a period of one year. Again, with the proviso that the Coast Guard publishes notice of the detention and determination in electronic form including the name of the vessel owner.

This effectively translates to the ban of all owners/operators that appear on the U.S. Coast Guard's Port State Control Owner & Operator List (see, <http://www.uscg.mil/hq/g-m/psc/owner.htm>). Despite cargo preference laws, many foreign flag owners carry government-impelled cargoes. Especially with respect to Ex-Im Bank financed cargoes. The present Port State Control "Hit

List" has several large operators of foreign tonnage including container-ships. It will be interesting to see whether the transshipment of containerized cargoes in vessel pools will also be affected by Section 408 of the Act.

Arthur Dimopoulos is an attorney in the maritime practice group at Preston Gates Ellis & Rouvelas Meeds LLP. Preston Gates is a transportation law firm with experience in maritime policy and law. The firm has offices in 10 cities including Hong Kong, Los Angeles, San Francisco, Seattle and Washington, DC. For more information on the preceding article, please contact Mr. Dimopoulos at (800) 992-1132, or (202) 628-1700, and by e-mail at artd@preston-gates.com.

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MARINE FINANCE

Shipping and Offshore Shares Follow Oil Price Down

After experiencing one of the best months ever in October, maritime shares on the Norwegian share market saw fortunes reversed in November, losing

almost half the gains from the previous month. The Shipping Index fell by as much as 13.8 percent in November, and the All Share Index dropped 5.1 percent.

Oslo did not benefit from the higher prices seen on most of the world's stock exchanges in November. This performance against the trend reflected the

drop in the price of oil. Little hope of new production cuts emerged from the OPEC meeting at the end of the month and this severely hurt the oil service sector in Oslo making Offshore the weakest industry last month.

The market value of offshore shares on the Main List dropped by as much as NOK 9.2 billion (26.7 percent) in November. Fear of reduced activity in the oil industry pushed down the value of shares of household names such as Det Søndenfjeldske, Transocean Offshore, TGS Nopec and Petroleum Geo-Services, whose share values fell between 28 and 36 percent. Northern Offshore share value more than halved during the month.

Among shipping shares the share value of Western Bulk Shipping dropped 37.5 percent and that of Jinhui Shipping and Transportation by 30 percent.

The best performing shipping shares, Swan Reefer, jumped 71.4 percent in November. During the month, Uglund International Holdings emerged as a major shareholder. Cruise operator Royal Caribbean Cruises rose 11.4 percent over the month and Team Shipping increased its value by 12.5 percent. Trading activity in shipping and offshore shares on the Main List rose by more than five percent from November 1997 as measured in the number of transactions. However, the fall in share prices this year led to a drop in the value of turnover from NOK 5.1 billion in November 1997 to NOK 4.3 billion last month.



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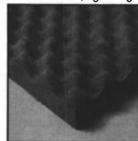
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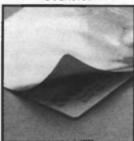
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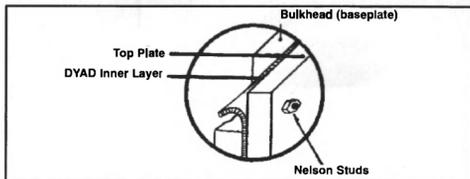
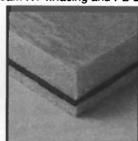
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November Winners		
Shipping	List	Change
Swan Reefer	SMB	+71.4%
Team Shipping	SMB	+12.5%
Royal Caribbean Cruises	Main	+11.4%
Wabo	Main	+9.5%
Stolt-Nielsen B	Main	+6.9%
Offshore		
Awilco B	Main	+4.2%
Awilco A	Main	+2.4%
Salsstad Offshore	SMB	-5.7%
Havila Supply	SMB	-6.5%
Siem Industries	Main	-10.8%
November Losers		
Shipping	List	Change
Western Bulk Shipping	Main	-37.5%
Jinhui Shipping and Transp.	Main	-30%
First Olsen Tankers	Main	-27.3%
Frontline	Main	-22.4%
NCL Holding	Main	-20.9%
Offshore		
Northern Offshore	SMB	-52.7%
Det Søndenfjeldske	Main	-35.9%
Transocean Offshore	Main	-34.5%
ProSafe	Main	-33.9%
TGS Nopec	Main	-31.8%

Samsung Signs Contract With Minoan

Samsung Heavy Industries signed a shipbuilding contract for two 1,000 passenger/car ferries with Minoan Lines Shipping of Greece in mid November. The contract has an option for two further vessels.

The 28,000 gt vessels, priced at \$75 million each, are 695 x 92 ft. (212 x 28m) and can cruise at a top speed of 31 knots. The vessels are due for delivery in February 2001 and July 2001, and will be deployed in the route between Greece and Italy.

Circle 11 on Reader Service Card

Jotron Electronics Takes Over Unicom

Jotron Electronics A.S. has taken over all patents, certificates and product rights including registered trade names and all stock value regarding the company Unicom which went bankrupt in July. Unicom produced and distributed the HeadCom radiocommunication system and headsets for use in noisy environments. Jotron has started performing service and repairs on the HeadCom equipment. The production of a selection of the HeadCom products is scheduled to begin before the year's end.

Circle 12 on Reader Service Card

Friede Goldman Wins Rig Outfitting Contract

Friede Goldman International (FGI) has announced that Friede Goldman Offshore - West, formerly HAM Marine, Inc. will complete the final outfitting and commissioning of the rig Noble Paul Wolfe. The project is the sixth EVA-4000 project under contract to FGI from Houston based Noble Drilling Corp. EVA-4000 projects consist of converting a submersible rig into a semi-submersible rig capable of deep water drilling.

Circle 27 on Reader Service Card

Austal Ships Wins BornholmsTrafikken Tender

Austal Ships has won the international tender to supply a 282 ft. (86 m) gas turbine powered vehicle-passenger catamaran for bareboat charter to the Danish government-operated BornholmsTrafikken. The Austal Auto Express 86 is scheduled to

depart Australia in November 1999 and will commence operation in December 1999 in the Baltic between Ronne on the Danish island of Bornholm and Ystad in the south east of Sweden.

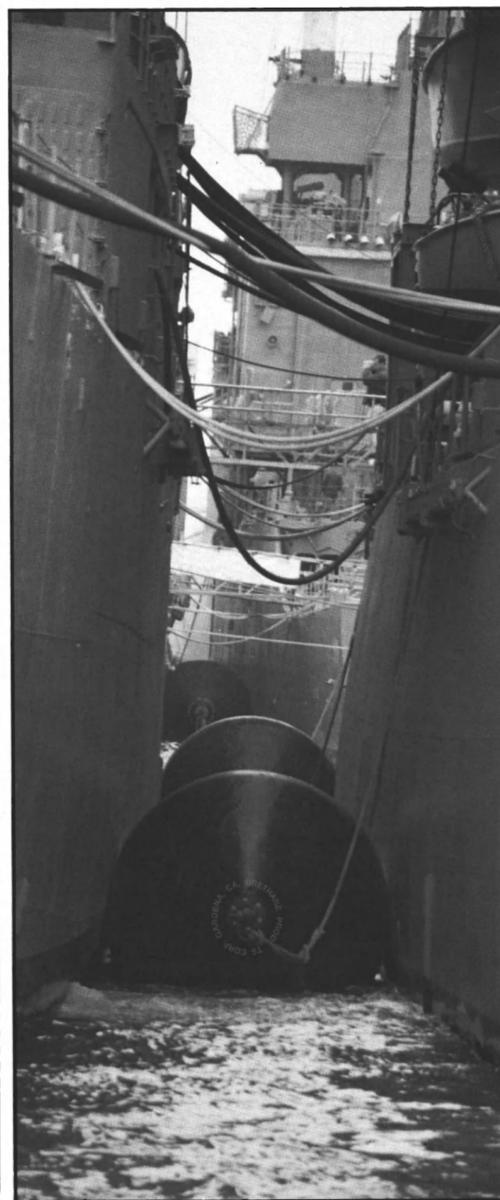
The catamaran will have a 500 dwt capacity, 100 tons greater than current Auto Express 86 produc-

tion, which enables a full payload of 144 cars to be carried in addition to 10 heavy vehicles of up to 20 tons each.

"With a full load maximum speed in excess of 50 knots, it will be the fastest vehicle-passenger ferry in the world with the ability to carry in excess of 100 cars. The

ferry will have the capacity to carry 1,000 passengers and 186 cars and will operate at a service speed of around 40 knots to comfortably achieve the scheduled crossing time of 65 minutes," said Chris Norman, marketing director for Austal Ships.

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MARINE FINANCE

Trawler Newbuilding Contract For Danish Company

A newbuilding contract for a 226 ft. (69 m) long shrimp trawler has been assigned to Ørskov Christensens Staalskibsvaerft A/S, Frederikshavn, Denmark. The contract is assigned by the Shipowner Polar Seafood Trawl of Nuuk, Greenland, and the vessel is set for delivery in February 2000.

Blount Signs Contract For Chicago Sightseeing Vessel

Shoreline Marine Co. of Chicago has signed a contract with Blount Industries to design and construct a 65 ft. sightseeing vessel. This new vessel will be used to give cruises on the Chicago River. The 233-passenger vessel will be powered by a six cylinder Detroit Diesel soft-mounted with vibration dampeners. It will be equipped with two 14.4 kW Isuzu generators. The contract price is listed at under \$1 million. It is scheduled for delivery via the Erie Canal in mid May 1999.

Tribe To Build Fifth Ferry

The Mashantucket Pequot Tribal Nation has reached an agreement with a Bahamian company for the construction and purchase of a high-speed ferry, the fifth to be built by the tribe's Pequot River

Shipworks. The new, 115 ft. vessel will be sold to Bahamas Fast Ferries Service Ltd. of Nassau, Bahamas. The company intends to use the 177-passenger, Bahamas-class ferry in service between the ports of Nassau and Harbour Island, which is part of the Bahamian island of Eleuthera.

Halter, JCM Sign Contract

John Crane Marine, part of TI Group, has won a new contract to supply U.S. shipbuilders Halter Marine. John Crane will supply seals for use in all of Halter's ships unless the owner specifies otherwise. This is John Crane Marine's first partnership with a U.S. shipyard.

CSL Wins Clamp-On Contract

Cochin Shipyard Ltd. (CSL) of India, has won a contract for Clamp-On structures to be used in Bombay High South and Heera Fields project. The structures enable drilling of an additional three oil wells per platform.

The project involves a pre-engineering survey of 12 platforms with the help of divers and diving support vessels for required data for design; design of the structures; fabrication; transportation to offshore; installation; post installation survey as well as commissioning and trials.

Gunderson To Build New Design Barge For Signet Maritime

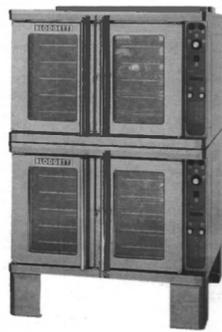


Gunderson Inc., a subsidiary of the Greenbrier Companies, has announced an order for a high-capacity deck cargo barge for Signet Maritime of Houston, Tex. Financing for the barge is being provided by Bombardier Capital, an international supplier of financial services. Gunderson will build the vessel at its Portland, Ore. facility with delivery scheduled for June 1999. The ocean-going barge will be 300 ft. by 100 ft. by 20 ft., will have a high load capacity of 4,000 lbs. per square foot of deck area, and a Signet designed parabolic bow and corrugated bulkheads for strength and ease of cleaning. Signet will operate the barge carrying heavy loads of machinery and other supplies to drilling platforms in the Gulf of Mexico and for project cargoes to Central and South America.

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These ovens come single or double stacked and either standard depth or extra deep. Delivery is stock - 3 weeks. They are available to the federal government under the following programs:

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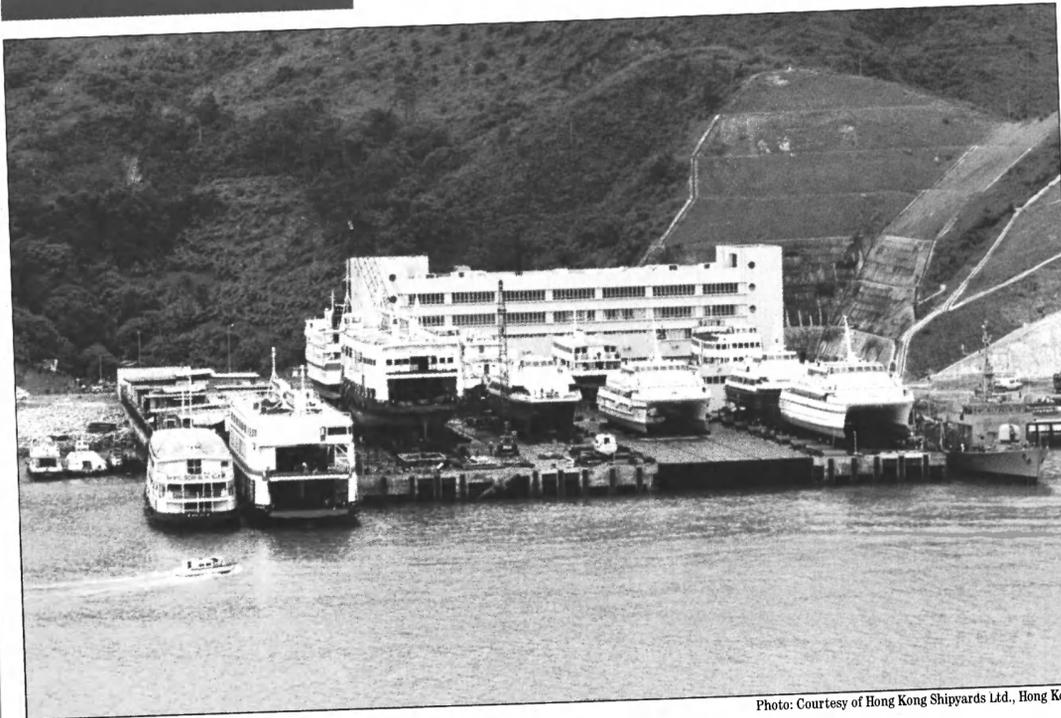


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NEW & NOTABLE

First of Four Delivered From Atlantic Marine



Atlantic Marine, Inc. of Jacksonville, Fla. recently delivered the OSV HOS Crossfire, the first of four offshore vessels contracted for HV Marine Service's subsidiary Hornbeck Offshore Services (HOS). The 200 x 54 ft. (61 x 16 m) vessel will service the U.S. Gulf's deepwater and shelf markets. HOS Crossfire is powered by two Caterpillar 3516B diesel engines each rated 2,000 bhp, with two Reintjes WAF 861 reduction gears at 5.872:1 ratio. Electrical power is provided by two Caterpillar 3406 DITA B series 250 kW generator sets. A 600 hp, 1,800 rpm Caterpillar 3412 DITA drives the Brunvoll FU-63-LTC-1550 CP controllable pitch tunnel bow thruster.

HOS Crossfire's three sisterships, HOS Super H, HOS Brigadoon, and HOS Dakota are scheduled for delivery in January, February and April 1999.

Circle 19 on Reader Service Card

Strategic Sealift Ship Delivered To Navy



The first of six Strategic Sealift ships being built by Avondale Industries shipyards division for the U.S. Navy was delivered in mid-November. The newest Navy ship was christened in 1997 by Mrs. Dolores Hope in honor of her husband — entertainer, comedian and patriot Bob Hope.

The 950 ft. (290 m), medium-speed, RoRo Sealift ships are among the largest in the Navy fleet. The ships are built utilizing Avondale's modular construction technology, with each ship made

up of more than 450 modules.
Circle 53 on Reader Service Card

Bob Hope Main Particulars	
Length, o.a.	950 ft. (290 m)
Draft	34.5 ft. (10.5 m)
Displacement	62,069 tons
Speed, cruising	24 knots
Crew	29
Accommodations	95
Cargo capacity	380,000 sq. ft.

Woodchip Carrier Forest Princess Completed



Forest Princess, a 51,152-dwt woodchip carrier ordered by Rioship Co. Ltd. was recently completed at the Maizuru Works of Hitachi Zosen. The vessel, under Panamanian registry, was delivered to the owner in late November. With an overall length of less than 656 ft. (200 m), Forest Princess can pass through the Inland Sea of Japan even at night. The vessel is equipped with a chip unloader composed of a hopper, deck cranes and conveyors for discharging woodchips to shore.

Circle 54 on Reader Service Card

Forest Princess Main Particulars	
Keel laying	May 1998
Launch date	July 1998
Delivery date	November 1998
Flag	Panama
Classification	NK
Length, o.a.	655.8 ft. (199.9 m)
Breadth	105.6 ft. (32.2 m)
Depth	75 ft. (22.9 m)
Full draft	37.7 ft. (11.5 m)
GT	41,484
DWT	51,152 m.t.
Main engine	Hitachi Zosen MAN B&W 7550MC
Speed, trial	16.5 knots
Complement	25

Aggersborg Delivered To Danish Owners

The second of two chemical tankers built by Alabama Shipyard, Inc. for Dannebrog Rederi AS of Rungsted Kyst, Denmark has been delivered. In March 1998, its sistership Amalienborg was delivered representing the completion of the first self-propelled ocean-going vessel built for export by an American shipyard in more than 40 years,



according to the U.S. Maritime Administration (MarAd).

Built under a Title XI loan guarantee from MarAd, Aggersborg is a 16,000-dwt IMO chemical carrier built in accordance with OPA 90. The vessel is a single decked, single screw chemical tanker with a double hull. It contains 12 epoxy-coated cargo tanks, and employs a cargo system with stainless steel piping and deep well pumps.

The main and auxiliary power plants were supplied by Wartsila. The propulsion system consists of a 4,800 kW diesel engine driving a four-blade Kamewa controllable pitch propeller through a Valmet reduction gear. The vessel is classed to Lloyd's highest class — +100A1 chemical tanker.

Circle 58 on Reader Service Card

Aggersborg Main Particulars	
Length, o.a.	472.4 ft. (144 m)
Length, b.p.	438.8 ft. (133.8 m)
Breadth, molded	75.4 ft. (23 m)
Depth, molded	40.6 ft. (12.4 m)
Draft, design	27.5 ft. (8.4 m)
Draft, scantling	28.5 ft. (8.7 m)
DWT	16,000
Cargo capacity	19,000 cu. m.
Main engine	Wartsila
Propeller	Kamewa
Bow thruster	Kamewa
Reduction gear	Valmet
Complement	18

Caterpillar Powering Two New Tugs For Crowley



Caterpillar was chosen to power two new construction 10,192 bhp (7,600 bkW) tractor tugs for Vessel Management Services (VMS), a subsidiary of Crowley Maritime Corp., San Francisco. The 153 ft. (46.7 m) vessels are touted as being the most powerful cycloidal propulsion tractor tugs in the world. The vessels are being built at Dakota Creek Industries, in Anacortes, Wash., to provide

tanker escort and assist services in Prince William Sound, Alaska, under contract to Alyeska Pipeline Service Co. The first vessel is scheduled for delivery in January 1999, and the second will enter service in April 1999. Two Cat 3612 engines, each producing 5,096 bhp (3,800 bkW) at 900 rpm, will power the vessels, driving two Voith Schneider cycloidal propulsion systems.

Niestern Sander Launches Navigia Newbuild



In mid October, Niestern Sander B.V. launched the containership M/S Keteldijk from its newbuilding yard in Delfzijl, the Netherlands. The owner of the ship, Navigia Shipping B.V., ordered two seagoing containerships in July 1997. The 304 ft. (92 m) long Keteldijk was delivered in December and its sister ship is scheduled for delivery in the first quarter of 1999. Both ships are of the Conofeeder 300 type.

M/S Keteldijk Main Particulars	
Shipbuilder	Niestern Sander B.V.
Vessel name	M/S Keteldijk
Vessel type	Container feeder
Owner/operator	Navigia Shipping
Designer	Conoship International
Flag	Dutch
Classification	Bureau Veritas
Delivery date	December 1998
Length, o.a.	304 ft. (92.7 m)
Length, b.p.	278.7 ft. (84.9 m)
Breadth, molded	52 ft. (15.8 m)
DWT	3,480
Draft	15.7 ft. (4.8 m)
Speed, service	15 knots
Cargo capacity	301 TEU
Main engine	Wartsila NSD 8L32E
Auxiliary engines	Scania
Thrusters	Jastram
Generators, Emergency generator	Stamford
Couplings	Vulcan
Reduction gears	Lohmann
Steering controls	Barkmeijer
Deck machinery	SEC-Groningen
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Chevron Takes Advanced Ship From Samsung

Chevron recently took delivery of an advanced, 310,000-dwt Very Large Crude Carrier (VLCC) from South Korea's Samsung, a ship which embodies many of the design and equipment technologies which are often discussed when the topic of next-generation tonnage arises.

Inside and out, Frank A. Shrontz (named for a Chevron director) is a modern double hull tanker built to the exacting demands of Chevron and ABS. The hull, in fact, was constructed to ABS SafeHull analysis (see story below), with additional engineering analysis (Dynamic Load Analysis and Spectral Fatigue Analysis). The coating of the ballast tank is a light color tar from epoxy throughout and the bottom of cargo tanks and up to one meter has been coated with epoxy to protect against the microbial corrosion attack. The design of this vessel follows traditional lines with five center tanks and five pairs of side cargo tanks (plus two slop tanks) included within a double skin hull. Double hull concept has been extended to E.R. HFO tanks with cofferdam. Three grades of cargo can be handled simultaneously, using three steam turbine driven 5,000 cu. m./hr. pumps, arranged at a pump room at the forward end of the engine room. A vapor recovery line to the manifold has been provided to allow future lightering service. A gas sampling system for the ballast tanks has been provided to continuously monitor for hydrocarbon gas in the ballast tank. Accommodation is provided for 16 officers and 18 crew, in 30 staterooms and four double-berth cabins, with a cabin also allocated for a dormitory crew. Living quarters have been completely separated from the engine and turbine casing, in a deckhouse built above the main transom stern. The machinery installation is centered upon a Samsung-built MAN B&W 7S80MC main engine developing 34,650 bhp at 79 rpm to drive a FP propeller for a service speed of 15.3 knots. The cooling for most services will be by fresh water through a central cooling system using 2 x 50 percent plate heat exchangers with 20 percent fouling margin.

Circle 48 on Reader Service Card



Frank A. Shrontz is a modern double hull tanker built by Samsung to the exacting demands of Chevron and ABS.

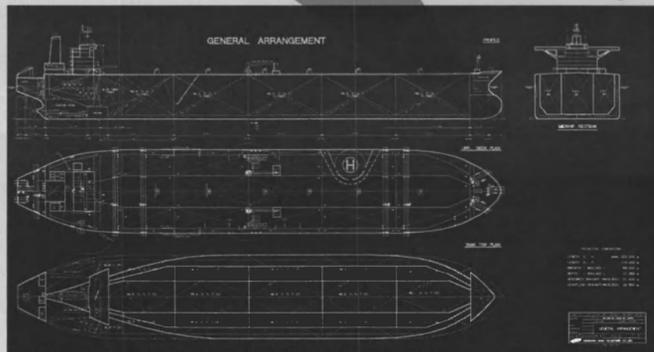
Frank A. Shrontz Main Particulars

Shipbuilder	Samsung Heavy Industries	Fuel consumption	91.6 MT/day
Type	VLCC	Classification	ABS
Flag	Liberian	% of high tensile steel	70%
Delivery date	Dec. 7, 1998	Main engine	Samsung MAN B&W 7S80MC
Length, o.a.	1,092 ft. (333 m)	KW and rpm	34,650 bhp @ 79 rpm
Length, b.p.	1,043 ft. (318 m)	Propeller	MAN/B, FP
Breadth, molded	190 ft. (58 m)	Cranes	Norlift
Depth, molded to main deck	102.6 ft. (31.3 m)	Alternators	Ssangyong B&W Holeby BL23/30H
Width of double skin, side	11 ft. (3.38 m)	Boiler	Mitsubishi
Width of double skin, bottom	8.8 ft. (2.69 m)	Mooring Equipment	Pusnes
Gross tonnage	160,036	Cargo Tanks (no.)	17
Displacement	250,149 ton	Cargo Pumps	Shinko
LWT (design)	290,955	Cargo Control	Samgong Danfoss
DWT (certifying)	309,999	Bridge Control	Sperry VMS VT
Draft (design)	70.2 ft. (21.4 m)	Fire detection	Autronica
Draft (scantling)	73.8 ft. (22.5 m)	Radars	Sperry
Speed, service (18% MCR)	15.3 knots	Loran C	Sperry
Cargo Capacity	350,600 cu. m.	Waste disposal plant	Hyundai Atlas
Water Ballast	98,483 cu. m.	Sewage plant	Hamworthy

ABS SafeHull: Technical Superiority By Design

The proliferation of advanced "engineered" solutions now available to ship designers and builders is truly mind boggling, given the rapid advancements forthcoming daily on the computer and software fronts. While it perhaps is often difficult to navigate through the clutter of new software offerings, and their true value to the end of building and maintaining safe, quality ships, the American Bureau of Shipping (ABS) has its solid reputation and a burgeoning number of references which attest to the quality of its suite of advanced computerized design and life cycle products. The hull of Frank A. Shrontz, the new VLCC from Samsung for Chevron, was built using the ABS SafeHull analysis. Initially released in 1993, SafeHull has been upgraded and enhanced continually since, and at press time there were 85 ships in service which have utilized the program, and 175 ships on order.

Circle 47 on Reader Service Card



Astilleros Españoles Delivers Knutsen Shuttle Tanker

Astilleros Espanoles group's Cadiz yard has again proven its excellence in the conversion market with the completion of a shuttle tanker to Norway's Knutsen OAS Shipping. The crude carrier formerly known as Tanana has been renamed Catherine Knutsen and the 150,000-dwt ship joined the carrier's fleet following a three month conversion. The ship initially arrived in Cadiz in mid-August for a massive renewal, adapting the ship's work on the North Sea, under Knutsen operation on charter to Statoil. Cadiz installed a bow loading system, a remodeled shaft line and a new CP propeller. Additionally, a station keeping system which incorporates a DPS enhanced with a hydroacoustic positioning radar system, four thrusters and two dedicated auxiliary engines, was incorporated to maximize safety and efficiency of operation, and has earned the DYNPOS Class 1 designation.

The ship's main particulars are as follows:

Length, o.a.	.....	869 ft. (265 m)
Breadth, molded	.....	143.4 ft. (43.7 m)
Depth, molded	.....	78 ft. (23.8 m)
DWT design	.....	141,720
Configuration	.....	double side & bottom
Power	.....	15,650 bhp
Cargo capacity	.....	160,307 cu. m.

Catherine Knutsen is the third shuttle tanker conversion carried out for Knutsen at the Cadiz yard since 1992.

Circle 39 on Reader Service Card

Conoco Completes Double Hulling Of Fleet

After achieving its goal of operating a 100-percent double-hulled crude oil tanker fleet in U.S. waters ahead of schedule, Conoco began operating an entirely double-hulled fleet of petroleum tank barges as well. Both achievements precede by more than a decade a legislative mandate that only double-hulled crude oil vessels serve U.S. ports by 2015.

"If we had not begun our journey to operate double-hulled tankers years ago, we would not be this far ahead of U.S. regulations for both double-hulled tankers and tank barges," said Antonio Valdes, manager of Conoco's worldwide marine group. "With

double-hulled vessels and our safety-management system, we are doing everything possible to prevent oil spills, better protect the environment and enhance our crews' safety."

Conoco's vision for utilizing double-hulled vessels began in 1990,

when the company became the first in the petroleum industry to voluntarily commit to building only double-hulled crude oil tankers that operate on the high seas. Expanding that commitment, Conoco pledged to operate a 100-percent, double-hulled oil

tanker fleet in U.S. waters by 2000, a goal the company achieved ahead of schedule last August with four such vessels. Two new double-hulled tankers are scheduled to arrive for U.S. service in late 1999.

Conoco recently completed the

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Circle 248 on Reader Service Card

Tanker Safety Takes Practice

ARCO, Crowley Marine, MSI team on pioneering training techniques

As the maritime industry and world at large look to ship owners for ever increasing safety measures, training of crew regarding all aspects of tanker operations has become tantamount to long-term success. When ARCO was considering a proposal to use its supertankers ARCO Spirit and ARCO Independence to bring oil into a berth not usually used by ships of this size, the company knew that an interactive approach to training was needed — including ARCO crews, tug operators and VTS — to make the plan feasible.

In 1995, ARCO had teamed with Crowley Marine Services and MarineSafety International (MSI) to pioneer an interactive simulation training course that brought together the tanker bridge team, the pilot, the tug master and the VTS operator to train together as parts of the system that moves

tankships out of Valdez, prince William Sound and into Rosario Straits, San Francisco, or Long Beach. When the San Diego proposal came up, ARCO turned to the same sort of testing to see if the ship utilization plan was feasible.

To this end, ARCO, San Francisco Pilots and Baydelta Maritime came together at MSI to test the plan. The plan for San Diego involved maneuvering the supertanker into a narrow channel, making a 135 degree turn with prevailing winds and currents, and laying the ship on berth so that the manifold lines up with the vales on the pier.

Upon conclusion of testing at MSI, those involved felt that the proposed plan was sound and the risks could be minimized without any extraordinary effort.

Circle 40 on Reader Service Card

conversion of its U.S. barge fleet when it received its fourth new double-hulled tank barge in three months and began operating a 100-percent, double-hulled fleet of 14, unmanned tank barges along the Gulf Coast from Brownsville, Texas, to Mobile, Ala. Powered by seven push boats, the barge fleet operates 24 hours a day, delivering approximately 20 million barrels a year of crude oil and products such as asphalt.

Harrier Deployed Offshore Equatorial Guinea

A unique Floating Storage and Offloading (FSO) tanker, the VLCC Harrier, was recently installed and operating at Zafiro field offshore Equatorial Guinea. The FSO is chartered into Zafiro from Mobil's transport fleet. At 289,000 dwt and almost 1,100 ft. long, it is slightly larger than the Zafiro Producer FPSO. It was converted for FSO service on a fast track basis and was installed at Zafiro field four months after the project was approved. Crude oil from the Zafiro Producer's process system is being transferred directly to the FSO through a 16-in. drape hose, rather than going through the FPSO's storage tanks.

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GULF COAST REPORT

Alabama Wins ATB Construction Contract

Alabama Shipyard, Inc. has signed an agreement with Reinauer Transportation Companies to build an articulated tug barge unit (ATB) with an option for up to three additional units. The 460-ft. (140 m) barge was designed by Alabama Shipyard to be double hulled in compliance with OPA 90 regulations. **Bob Hill** of Ocean Tug and Barge Engineering designed the 7,200 hp, 124-ft. (37.8 m) tug. The ATB features the patented Intercon tug/barge coupler system designed and built by Intercontinental Engineering and Manufacturing Corp. The system consists of two independently mounted gear driven ram assemblies, which form a rigid and mechanically locked connection between the tug and barge. Engineering has been completed and construction is planned to begin on February 1 with delivery of the first unit in late 1999.

Circle 80 on Reader Service Card

Reinauer ATB Unit Main Particulars

Barge	
Length	460 ft. (140 m)
Breadth	72 ft. (22 m)
Depth	41 ft. (12.5 m)
Draft, LDW	29.6 ft. (9 m)
Capacity	135,000 barrels
DWT	19,500 m.t.
GT	8,400 m.t.
Tug	
Length	124 ft. (37.8 m)
Breadth	40 ft. (12 m)
Depth	22 ft. (6.7 m)
Draft, DWL	19 ft. (5.8 m)
Displacement	1,369 LT
HP	2 x 3,600 engines
Speed, with barge	11 knots

Halter Signs Great Lakes Barge Contract

Halter Marine Group, Inc. has signed a contract with Great Lakes Marine Leasing, LLC to build a 740 ft. (225 m) self-unloading dry bulk cargo barge for service on the Great Lakes. To be named Great Lakes Trader, the barge will be operated by Van Enkevort Tug and Barge and is reportedly the largest to be built by Halter. The vessel will be built and launched in two halves at Halter's Gulf Coast Fabrication, Inc. in Pearlinton, Miss. and towed to New Orleans where the two halves will be joined in Halter Gulf Repair's large floating drydock. Final outfitting will be completed at Halter Gulf Repair by

the owner. Great Lakes Trader will be used primarily to transport and discharge taconite pellets, limestone and coal. It will have a single continuous hold/elevator conveyor belt and a 265 ft. (81 m) boom conveyor that can discharge 6,000 long tons per hour. It will be paired with the 10,200 hp twin-screw tug Joyce L. Vanenkevort, or

a sister tug, as a dual mode, integrated tug/barge (ITB) with an articulated connection system.

Circle 81 on Reader Service Card

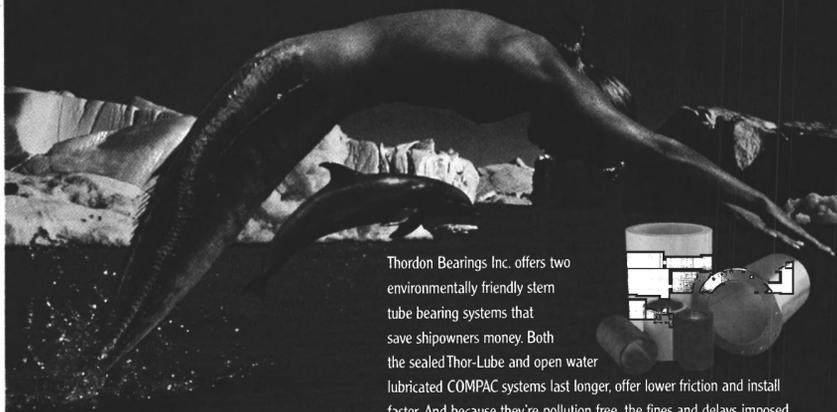
USACE Dredges Ocean-Ship Channel

Emergency dredging was uti-

lized to restore the ocean-ship channel to 30-ft. depth in the Mississippi River-Gulf Outlet (MR-GO), the USACE New Orleans District reported last month.

Hurricane Georges had caused severe shoaling in late September on the MR-GO, a 76-mile, man-

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GULF COAST REPORT

made waterway, linking the Port of New Orleans' inner harbor – and its leading cargo-container terminal – to the Gulf of Mexico.

The hurricane had reduced the depth to 25 ft., although a depth of 33 ft. was planned for January 3,

1999, and a depth of 36 ft. is planned for February 3, 1999. The estimated cost of the emergency dredging is \$37.5 million.

Additionally, enforcement of safety zones in the turbulent outflow channels of the Old River con-

trol structures began December 7, said the USACE. The structures are 80 miles northwest of Baton Rouge.

No vessels or watercraft – commercial or recreational – will be permitted within 300 ft. of the

Auxiliary Structure and 175 ft. of the Low Sill Structure. Warning signs clearly mark the safety zones.

The two structures regulate the diversion of water from the Mississippi River into the outflow channels, and then, into the Atchafalaya River. This regulation prevents the Mississippi from making a catastrophic change of course into the Atchafalaya.

Violators will be issued a warning for a first-time offense during a two-month grace period.

All multiple offenders, and all offenders after the Feb. 1 grace period ends, will be issued citations. Federal law provides maximum penalty of \$5,000 fine and six months in jail. Multiple offenses will result in appearance before a U.S. magistrate, who can require the imprisonment and/or band a violator from federal lands and waters.

Gulf Coast Dockside Adds Barge-Mounted Crane

Gulf Coast Dockside, Inc., recently expanded its bulk cargo stevedoring capabilities within the Port of New Orleans with the addition of a second barge-mounted crane, Docksider Too. Gulf Coast Dockside's first barge-mounted crane, Docksider, began operations in 1997.

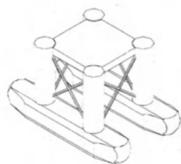
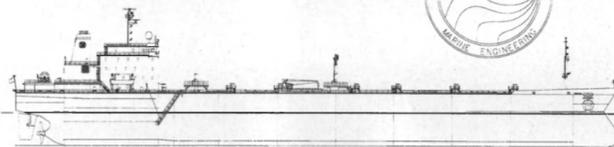
The two high-speed clamshell cranes, with 120 ft. boom, are mounted on a pedestal base 40 ft. above the water line. The operator cabs are raised another 17 ft. to provide enhanced visibility of the ship's holds.

In addition, maritime executive **William T. Bergeron** announced the recent acquisition of MariTrend, Inc., a general stevedoring company from the Vectura Group, Inc., for an undisclosed amount. MariTrend leases the Alabo Street Wharf, a two-berth terminal on the Mississippi River at the Port of New Orleans. Included in the purchase is Gregory L, a barge-mounted crane with high-speed bulk and general cargo production capabilities.

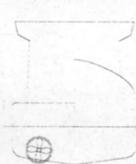
MariTrend joins other companies managed by The Bergeron Group, Inc., including Bergeron Marine Service, Inc., Greenville Shipbuilding Corp. and Gulf Coast Dockside.

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LCES System
The Double Hull Solution
in retrofit technology U.S. Patent



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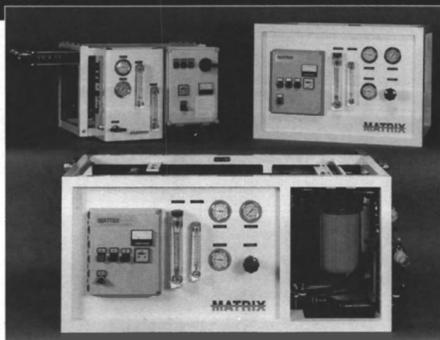
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Circle 276 on Reader Service Card

Lafarge Ballast Installed On Six APL Container Ships

Lafarge, formerly Redland Genstar, Inc., was awarded a contract from APL (Neptune Orient Line) to install more than 21,000 metric tons of its Ballast-Crete fixed ballast in six container ships. The contract was completed during July and August 1998, working around the sailing schedules of the ships. With ballast installed during cargo operations, there was little interruption to the ship's schedule or disruption to ongoing normal terminal operations.

Circle 61 on Reader Service Card

Paratherm Opens U.K. Branch

Paratherm Corporation, a U.S.-based manufacturer of heat transfer fluids for general industry, has opened a new full service facility in the U.K. to serve customers in western Europe. The new facility, located near London, is a partnership between Paratherm and Golfray Ltd., and will stock several types of Paratherm heat transfer fluids.

Circle 62 on Reader Service Card

Autoship Wins Contract, Receives DNV Approval

Autoship Systems Corp. of Vancouver, Canada has recently received Det Norske Veritas (DNV) Type Approval for its loading instrument software, Autoload. The company has announced that it has won an international competition for the contract to provide customized software to Wilhelmsen Lines AS of Oslo, Norway. The project will include the development of state of the art computerized stowage planning and cargo management system to be used company-wide onboard 28 RoRo ships and in 19 regional offices of Wilhelmsen Lines.

Circle 1 on Reader Service Card

NNS Announces New Directors

Newport News Shipbuilding (NNS) has promoted several employees to director positions within the organization. **John Lilley**, promoted to director of Carrier Overhauls, will lead the effort to plan and conduct overhauls of aircraft carriers at NNS. A 26-year employee of NNS, **Harold Paxton** has been appointed to director of Carrier Construction. Mr. Paxton will be responsible for

January, 1999



John Lilley



Harold Paxton



Tim Thomassy



Mike Wynn

all carrier construction activities to include ship progress, schedules and performance.

Tim Thomassy has been appointed to director of Business

Development.

Mr. Thomassy will identify and evaluate new business opportunities for NNS, as well as provide aircraft carrier and submarine

engineering design and analysis support to the U.S. Navy customer and represent NNS with the Navy and other Department of Defense customers. **Mike Wynn** has been appointed director of CVN New Construction/Design, responsible for the non-nuclear design of the Ronald Reagan (CVN 76), as well as CVN 77 and future aircraft carriers.

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Y2K: The Truth *and* Consequences

By Charles W. Gill & James A. Trautwein, KPMG LLP

It's the vacation of a lifetime — a wintertime cruise to a lush island paradise. What better way to ring in the New Year?

If the year you will be ringing in is the year 2000, you may want to think twice about boarding the ship.

There is a good chance that the things that enable us to get up and go may go haywire on January 1, 2000. Like other modes of transportation that depend on computer-driven systems or embedded microchips to function, many passenger and commercial ships may be set adrift by the Year 2000 (Y2K) problem on that day.

At one second after midnight December 31, 1999, computers and applications that use two digits to keep track of the date will recognize "00" as the year 1900, rather than 2000. That means that programs and systems on ships, at port facilities and in the satellite-driven Global Positioning System (GPS) could malfunction — or stop working altogether.

Although it's difficult to assess the exact impact of the Y2K problem on the cruise ship and commercial shipping industries, it will be significant. On-board systems, navigation, fueling, scheduling, passenger ticketing, inventory, cargo tracking, information systems, management operations — nearly every area of the cruise-line and shipping business — could be affected.

Engines could shut down, ships could stray off-course and collide, passengers may find themselves stranded at sea and cargo containers will sit on the docks, waiting to be loaded onto ships that can't get into port.

Or nothing may happen.



at all. The real Y2K problem is not knowing whether you have a problem. And that poses a threat to your passengers, your crew, your customers and your business.

Whether or not a ship is vulnerable to the Y2K glitch generally depends upon its age, the age and origin of its on-board systems, the types of computer applications running those systems and the number of chips embedded in them.

A ship that was built in the 1970s, for example, is more likely to depend on its crew and fewer automated, more manual operations to make it sail. On the other hand, the newest ships rely heavily on state-of-the-art technology and embedded chips that link on-board systems to each other and to on-shore systems, such as cargo handling and security systems and those that support refrigerated containers. Navigation; communications; engine and machine monitoring; electrical, air conditioning and heating systems — virtually everything that keeps a ship afloat and operating — may contain from one to hundreds of hidden, embedded computer chips and chips-within-chips.

It would seem reasonable then that the newer and more technologically advanced a ship is, the more Y2K-compliant its systems would be. Unfortunately, that isn't always the case. Like manufacturers in other industries, shipbuilders may have been unaware of, or did not consider, the Y2K problem until recently. Consequently, a 10-year-old ship may face as many problems as one that is years older. And there is concern among industry experts that even the newest ships may have compliance issues.

The bad news is that, although not every embedded chip is supporting a critical application or function, every system on every ship is likely to contain one or more microchips whose internal clocks are counting down to a potential Y2K breakdown.

The good news is that, even though there is less than a year until the year 2000, identification and remediation of potential systems failures are still possible.

What happens if you can't find them all? At best, a few inconveniences as some systems shut down. At worst, a disaster that can destroy your business. In any case, it's imperative that your organization be prepared to protect passengers and crew, and minimize financial losses.

The first step to dealing with potential Y2K problems is to take the issue seriously! There are still too many people who believe that Y2K is only a computer problem, or that it won't affect ships, or that their normal systems' back-up procedures will resolve or prevent a problem on their ships.

Imagine the worst, then design and implement a Y2K identification and remediation program. Identify everything that may be impacted, including

LR Issues Guide To Solving Millennium Bug Problem

Lloyd's Register (LR) has warned shipowners and operators that they must accept the possibility of failures occurring as a result of the Year 2000 problem and that the consequences might be serious or even catastrophic. Shipowners and operators must act now to assess the risk to their businesses posed by date processing electronic systems - which may be 'embedded systems' and not therefore apparent from the exterior of the equipment - and plan preventative action. This blunt advice appears in LR's new guide to solving the problems associated with ships and the Millennium Bug.



The guide has two main aims: to outline the risks posed to shipping by the computer date problem, and to explain the process by which these risks can be identified, assessed and managed.

The guide points out that, in the light of these potential problems, the need for each shipowner and operator to develop a specific Year 2000 project is inescapable. The overall aim of such a project for each owner and operator is to avoid any incidents that might cause collision, loss of life, loss of vessel, pollution and legal and commercial penalties.

Circle 36 on Reader Service Card

BIMCO Y2K Clause Launched

In response to inquiries from shipowners, BIMCO has drafted a Standard Year 2000 Clause for Voyage and Time Charter Parties, addressing the year 2000 compliance obligations of both charterers and owners. Based on the provisions relating to the exercise of due diligence in making the vessel seaworthy already included in most voyage and time charter parties, BIMCO concluded that there was no legal need for a specific Year 2000 compliance clause. However the organization recognized that increasing members' concerns indicated a clear commercial need for such a clause. The BIMCO Year 2000 Clause does not extend the owner's liabilities beyond those of the Hague and Hague-Visby Rules, thus ensuring that owner's P&I Club coverage will not be prejudiced by incorporating the clause into their charter parties. In addition, it has been broadly worded to extend compliance obligations beyond the vessel to hardware and software used by the charterers and the owners in their shoreside operations — such as the charterer's system for the transfer and payment of funds.

Circle 5 on Reader Service Card

on-board and on-shore systems and procedures. Test each item to determine whether and how it will be impacted. Testing should include changing the date and the number of digits in the date, since applications are often written using different "date lengths," usually four, six or eight digits.

That means you must do more than advancing the date on the ship's master control system to January 1, 2000, or manually changing the internal clocks on those systems where the clocks are accessible. You must verify that the date change is communicated to each and every subsystem on the ship. Check the engine room. Check the propulsion system. Check the control and alarm systems. Check the auxiliary controls.

One of three things will happen: The systems will stop, they will spit out erroneous data or they will continue to function normally. This will give you an idea of the extent of your Y2K exposure, and help you decide how you're going to minimize it.

As companies proceed with Y2K compliance efforts, some treat a minor glitch as a major failure. Others believe that as long as they can generate revenue and satisfy customer needs without jeopardizing safety, they are in compliance.

Cruise lines and shipping companies should develop, implement and document a detailed Y2K plan. Contact the manufacturers and vendors of equipment that has been identified as having potential Y2K glitches for possible fixes. Develop contingencies for every possible failure and have back-up operations in place where practi-

cal. Don't forget the external systems that your operations are dependent on, such as fuel and food suppliers and freight forwarders you do business with.

It's easy to underestimate potential problems, and the amount of time and money needed to correct them. And as of January 1, 2000

approaches, your options decrease considerably.

A Y2K assessment and systems' audit reviews can mitigate business failures of Titanic proportions.

Charles W. Gill is a partner with KPMG LLP and the national leader of

KPMG's Maritime Industry practice in New York City; James A. Trautwein is a manager in KPMG's Information Risk Management practice in Fort Lauderdale, Fla.

The views and opinions are those of the authors and do not necessarily represent the views and opinions of KPMG LLP.

Mark These Dates, Too

January 1, 2000 isn't the only day that may impact the shipping industry. According to the United States Maritime Administration, some computer programs may use a "99" as an exception code, meaning the date is unknown or unidentified. Consequently, other critical dates include January 31, 1999 and September 9, 1999 for some PC internal operating systems; August 22, 1999 for Global Positioning Systems; and February 29, 2000, since 2000 is a leap year. Test your systems for each of these dates.

Additional information related to Y2K issues and critical dates for the maritime industry may be found on the Maritime Administration's Year 2000 page on the World Wide Web at: http://marad.dot.gov/whats_new/y2k.html

January, 1999

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SpecTec Offers Full Y2K Assessment

SpecTec has developed the Year 2000 Compliance Assessment program to help shipowners successfully meet the impact of the Millennium Bug. Shipboard equip-

ment and control systems are assessed for functionality and compliance in handling the changeover to the year 2000. Equipment covered by SpecTec's assessment of automation and embedded chips includes cargo control; reefer data loggers and controls; ballast/ullag-

ing monitoring; propulsion/automation system; condition monitoring; integrated navigation and bridge; GPS; communications; air conditioning; and domestic systems. Additionally, the assessment covers ship management systems and Point of Sale equipment, pas-

senger/hotel management/ retail systems, and PABX/telephone systems for passenger vessels.

Circle 3 on Reader Service Card

James Marine Appoints Y2K Project Leader

Rachael Calcioli has been appointed project leader for James Marine Services Ltd.'s Year 2000 compliance program, which has been designed in accordance with its shipowner clients' quality and safety management systems, certified to ISO 9002 and ISM codes. James Marine is in the process of contacting its suppliers to determine whether they are implementing a year 2000 compliance program, and whether the equipment they provide is Y2K compliant.

Intergraph Announces Millennium Strategy

All new Intergraph products currently sold are Year 2000 compliant or will be certified as new versions and utilities are released in 1998. Certification ensures that Intergraph PCs, workstations, servers, and software will be compliant with Year 2000 date processing criteria and will be able to correctly process dates within and between the 20th and 21st centuries. Intergraph is evaluating prior generations of its hardware and software for compliance and will provide compliancy information in response to customer inquiries.

Circle 6 on Reader Service Card

Swire Group Sets Y2K Compliance Goals

Each operating company within the Swire Group has set up its own Y2K project; the group as a whole aims to achieve Y2K readiness for its business-critical systems by March 1999. Readiness will be achieved when an inventory of all relevant equipment and systems has been assessed and tested for potential Y2K problems with a plan of action relating to any identified problems decided and arranged. Swire Group aims for complete compliance by June 1999. This will leave a reasonable amount of time in advance of the millennium date change for any last modifications. Group companies plan to have business contingency plans in place in the event of

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disruptions caused by system or equipment failure or third party non-compliance.

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KPMG Survey Reveals Top Y2K Compliance Obstacles

KPMG LLP conducted a survey of transportation industry executives to determine what is the biggest obstacle to achieving Year 2000 compliance. A lack of technical resources was cited by 46 percent of the respondents, while 22 percent said that high cost was the biggest hurdle. A further 14 percent responded that the lack of a sense of urgency made working towards compliance more difficult. According to the survey, 97 percent of respondents said they would be fully compliant on January 1, 2000, but less than half said they have a contingency plan in place to deal with possible system breakdowns or contamination issues.

Circle 8 on Reader Service Card

ISA Industry Guides To EDI Now Y2K Compliant

The Information System Agreement (ISA) has completed work on version 4010 of the Ocean Transportation Industry Guides to Electronic Data Interchange (EDI). The guides provide comprehensive information, from both the technical and business standpoints, on how ISA developed standards for the shipping industry are used. By following these guides, customers can electronically access the services of ISA members who collectively own more than 400 containerships and barges, totaling more than 1.4 million TEUs, and call on more than 300 major ports. ISA's current members include APL Ltd., Crowley American Transport, Hapag-Lloyd, K-Line America Inc., Maersk, Mitsui OSK Lines, OOCL, P&O Nedlloyd, Sea-Land Service and Yang Ming Line.

Circle 37 on Reader Service Card

Newest Version of ITM Ship Released

ITM Corporation has released the latest version of its ITM Ship system, the Internet communications tool that links shippers to their transportation service providers. The new Version 1.3 adds ocean service to the current air freight service. Features added

January, 1999

include: INCO terms; third party address keeper; duties and tax billing; international date format; choice of metric or standard weights; as well as a Schedule B hyperlink. Expanded capabilities include unlimited entries for piece details.

Circle 41 on Reader Service Card

Hydrocomp Updates Propeller Sizing Software

Hydrocomp, Inc. of Durham, N.H., has released PropExpert 4.0, the updated version of the company's software for the selection and analysis of propeller systems for workboats and pleasure craft. The

new version features improvements in shaft sizing calculations; better speed prediction algorithms; more accurate propulsive coefficients; improved top speed prediction; more review parameters for sea-trial analysis; as well as faster operation.

Circle 42 on Reader Service Card

Leaders in Marine Design Software



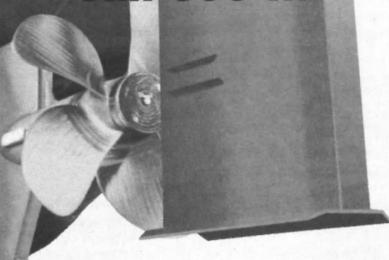
<p>FlagShip <i>from Proteus Engineering</i></p>  <p>FlagShip is a complete ship design system, including hullform design (<i>FastShip</i>), structural design and optimization (<i>MAESTRO</i>), stability, powering, maneuvering, seakeeping, shipyard cost estimating and interfaces to CAD and ship production programs. FlagShip is based on time-tested, best-in-class applications, which are in use by more than 1,000 designers in over 30 countries around the world.</p>	<p>NavCad <i>from HydroComp, Inc.</i></p>  <p>NavCad offers an integrated platform to predict resistance and power, and to determine optimum propeller parameters. With NavCad each aspect of a ship's performance can be evaluated for virtually every type of displacement hull, semi-displacement and planing craft, river barge train, catamaran and auxiliary-powered sailboat.</p>
<p>General HydroStatics (GHS) <i>from Creative Systems, Inc.</i></p>  <p>Widely recognized as the most advanced and productive trim/stability/strength software. Specialized versions are available for ship operators, for salvage engineers and for small craft designers. Includes efficient modeling for all types of complex vessels, and the ability to analyze them both afloat and aground.</p>	<p>ShipCAM98 / CAD-Link98 NC-Pyros98 <i>from Albacore Research Ltd.</i></p>  <p>Integrated ship production for Win95/NT. ShipCAM98: Fairing and lofting including frames with cutouts, plate expansion, shell expansion and inv. bending. CAD-Link98: AutoCAD13 based 3D structural modeling as easy as 2D drafting plus weight & CG. NC-Pyros98: NC-code generation from CAD drawings.</p>

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Pinpoint Produces Machinery Alignment Kit

Pinpoint Laser Systems has introduced a new laser Microgage machinery alignment kit designed to be versatile for many applications, including aligning drive shafts, positioning turbines, adjusting frame weldments, bore alignment, and checking surface flatness, among other things. The

Microgage receiver and laser source are compact and machined of solid aluminum with multiple reference surfaces and a hard anodized coating for wear resistance. The digital display provides readings to 1/1,000 in. with accuracy of .004 in. The kit includes eight components for mounting and alignment applications; a leveling base for setting flat planes and adjusting machinery; a 90 degree

beam splitter for squaring assemblies; a tripod; and other accessories for use in many factory applications.

Circle 24 on Reader Service Card

Graham Named President Of Litton's Sperry Marine

Litton said that Dr. Clark Graham will succeed Paul David

Miller as president of Sperry Marine Inc. effective Dec. 23, 1998. In his new position, Dr. Graham will oversee the companies comprising Litton Marine Systems. Mr. Miller left Litton to join Alliant Techsystems Inc.

Dr. Graham joined Sperry Marine in July 1994 as a product line manager, and was shortly thereafter appointed to the position of vice president of engineering for the division. Prior to joining Litton, Dr. Graham completed a 30-year career with the U.S. Navy attaining the rank of Captain.

Lockheed Martin Executive To Head Southwest Marine

United States Marine Repair, Inc. (USMR) has appointed Monty W. Dickinson as president and general manager of its subsidiary, Southwest Marine (SWM), located in San Diego, Calif. Mr. Dickinson joins Southwest Marine following a 37-year career with Lockheed Martin and General Dynamics. He will fill the position previously held by B. Edward Ewing, now president and CEO of USMR.

ABB And IHI Form New Joint Company

ABB Industry K.K. and Ishikawajima-Harima Heavy Industries Co. Ltd. (IHI) jointly established Turbo Systems United Co. Ltd. in October. The joint venture sells and services the full range of ABB and IHI turbochargers for marine and power plant use in Japan and Taiwan. Kendschi Takeo has assumed the position of executive director and president. Oliver Riemenschneider has been appointed executive director and senior vice president, and is also responsible for after sales services business. Masashi Kimura has been appointed director and division manager of turbocharger business.

Circle 10 on Reader Service Card

New Color Chart Plotter Expected Next Month

Datamarine's new color chart plotter, the D8000 will be available in mid February, 1999. It is designed to be used in any lighting condition, including direct sunlight. The 10.4 in. color display has 1,000 nits of backlighting and the screen is designed to be clear and crisp from any viewing angle. The D8000 is designed to operate through the usage of soft keys, an intuitive guide that leads the user through the various functions of

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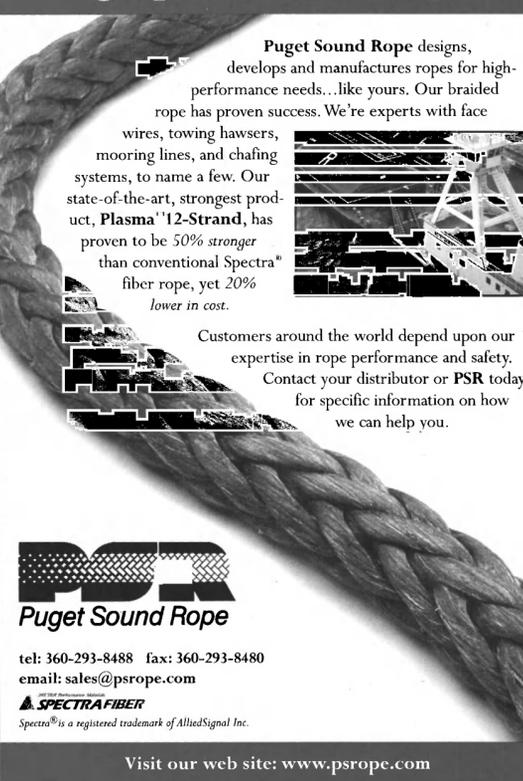
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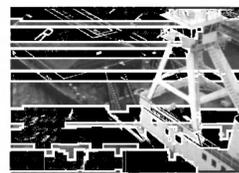
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the chart plotter. A split-screen option allows the user to have two smaller screens side-by-side, perhaps showing the route plan on one and the 3-D steering aid on the other. Other features include Electronic Bearing Lines (EBL), Variable Range Marker (VRM), Head-up, North-up, Course-up, waypoint arrival/cross track error alarm, and 100 own ship's tracks.

Circle 25 on Reader Service Card

New Technology Unveiled At Port Weller

In mid-November, Canadian Shipbuilding & Engineering (CS&E) unveiled a \$6 million investment in new, high-technology robotic equipment recently installed at its Port Weller Dry Docks facility. The new equipment includes a plasma-arc cutting machine, a robotic profile cutting

line, a robotic welding line, and a semi-automatic panel production line.

Circle 9 on Reader Service Card

BV Awards First VeriSTAR Machinery Notations

Bureau Veritas has awarded the first certificates under its new risk-based classification system, VeriSTAR Machinery. Denmark's

Elite Shipping A/S and France's SOCATRA were presented with certificates for ships certified with the new notation. VeriSTAR Machinery is a risk-based system which integrates the owner's planned maintenance system with classification. Risk analyses are performed on the planned maintenance system to establish an acceptable risk level. The new system was launched in November in London. VeriSTAR Machinery has been tested in service on several different ships, and is designed to achieve more cost-effective operation and classification.

Circle 13 on Reader Service Card

BF Goodrich Merging With Coltec Industries

BF Goodrich and Coltec Industries have announced plans to merge. Under the terms of a definitive agreement approved by the boards of both companies, Coltec shareholders will receive .56 shares of BF Goodrich common stock for each Coltec common share. Based on BF Goodrich's closing price of \$35.94 on Nov. 20, 1998, the transaction is currently valued at \$20.13 per Coltec share, or a total of approximately \$2.2 billion, including the assumption of Coltec debt. The companies expect to achieve minimum annual cost savings of approximately \$60 million by 2001, with significant savings beginning in 1999. The transaction is expected to be completed by as early as spring 1999, and is subject to approval by shareholders of both companies, applicable regulatory authorities, and other customary conditions.

FN TAPE

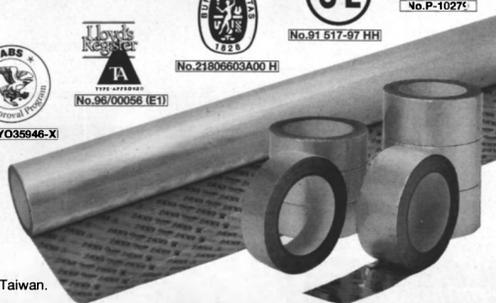
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T&T Introduces GMDSS Approved Inmarsat-C Antenna

Thrane & Thrane A/S (T&T) now offers a new GMDSS approved Inmarsat-C antenna, the TT-3005M Capsat Maritime Antenna. This new antenna will replace the existing T&T maritime Inmarsat-C antennas over time. The lightweight, compact antenna is omni-directional and is designed to offer trouble-free operation down to -15 degrees of elevation. TT-3005M can handle up to 32kB message size transmission — allowing pictures, drawings and other types of graphic files to be transmitted.

Circle 14 on Reader Service Card

Hermont ISO-9002 Approved

Hermont Marine, Inc. successfully passed the ISO-9002 audit in mid November. The company provides services in pollution abatement, engine efficiency improvements and safety.

Circle 44 on Reader Service Card

Almskog Begins New Role

In early December, **Kjell E. Almskog** officially took up his role as president and CEO of Kvaerner. **Christian Bjelland** has stepped down as acting CEO.

Cummins To Offer Cose Credit Financing

Cummins Engine Company, Inc. and Case Credit Corporation have entered into an agreement through which Case Credit will make financing available for North American commercial marine customers building or repowering vessels powered by Cummins engines.

"It provides a full array of quality financing options for our customers, a value-added way to increase Cummins' sales and a means for growing Case Credit's

portfolio," said **F. Joseph Loughrey**, executive vice president and group president-industrial for Cummins.

Cummins Wartsila Regional Office

Cummins Wartsila has recently opened the Americas Regional Marine Sales Office in Charleston, S.C. This sales and marketing facility will provide primary support to the North American market and the Distributor Network, which will be announced shortly. The new office is led by **Geoff Conrad**, Regional Director Marine Sales - Americas.

Moran Announces Executive Appointments

Edmond J. Moran, Jr., a Moran employee for 27 years, has been named a senior vice president and will oversee the company's port operations and ship docking business based in 13 ports on the East and Gulf coasts of the U.S. **Gregory F. McGinty**, a former Turecamo executive, has been named a senior vice president with responsibilities for business development and the company's con-

struction and repair activities. **William P. Muller** will remain president of the company's Moran Services Corp. subsidiary and has also been named a senior vice president of Moran Towing Corp. with responsibility for the company's marine transportation and contract towing operations.

Peter J. Nistad, a former Turecamo executive, has been named a senior vice president with responsibility for port operations and ship docking in Southeastern and Gulf ports.

Cruisair Redesigns Line

Next year Cruisair will offer a completely redesigned Sentry FR line of ferroresonant marine battery chargers. The series is available in a wide selection of models, ranging from 20 to 60 amps, for 12, 24 and 32 VDC output and 115 or 230VAC, 60 and 50 Hz inputs. The charger design features an automatic shut-off circuit, to avoid overcharging and dehydrating batteries. The unit shuts itself off once all batteries reach full charge.

Circle 15 on Reader Service Card

Mobil Launches Water In Fuel Guarantee

Mobil International Marine Fuels is now offering a cash-back guarantee of low water content in its fuel oil. "Mobil guarantees a maximum water content of 0.5 percent in its fuel oil supplied at Singapore," says **Iain White**, Mobil manager for marine fuels and trading. "Anything more than that and we pay the buyer the difference."

Heavy fuel products sold to the ISO 8217 standard are required to have a water content of less than 1.0 percent. Mobil is to guarantee a content of less than half of this for all its Singapore supplies. "Owners and charterers want the best price and the best quality. And they do not want disputes over quantities. Excess water in the fuel affects both price, quality and quantity. We are certain of the high quality of our product, and prepared to guarantee it," said White.

Mobil is also adding to its Singapore product range. In addition to the full range of gas oil and low viscosity fuel oils, it will now be able to supply 500 cst oil for ships burning high viscosity fuel.

Circle 18 on Reader Service Card

WITHOUT CLEAR AND ACCURATE NAVIGATIONAL INFORMATION YOU COULD ALWAYS RUN INTO THE UNEXPECTED

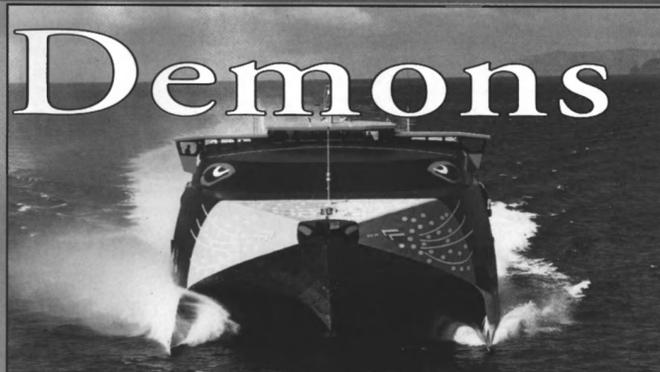
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ADMIRALTY
CHARTS AND PUBLICATIONS

Circle 266 on Reader Service Card

Speed Demons

While small relative to the whole, the fast ferry niche of the maritime market is a glamour side of the business which allows designers, builders and equipment makers to experiment and expand lines of equipment and thinking in regards to high performance. For those that doubt that speed brings out "the wild side," think of the last time a VLCC was painted to resemble a Tasmanian Devil, as the Alstom RK270-powered, Incat-built Tasmanian Devil was (pictured to the right).



The Incat Tasmanian Devil, powered by the Alstom RK270 20-cylinder engine, achieved more than 5 knots in light conditions on its first day of trials.

Fascination with speed — in all modes of transportation — is always tempered, though, with the need for safety and stability, ensuring that power and control remain hand-in-hand. This is especially true in the maritime industry, which has significantly accelerated the issues of safety of ship, crew and passenger in recent years.

A significant debut of a new fast craft was at a New Orleans exhibition, at which Halter Marine Group puts its innovative high-speed, low-wake E-CAT through its paces. The catamaran passenger ferry (which follows an emerging trend of innovative paint jobs as well as technological advances) made a 40-knot plus debut during the International Marine Transit Association (IMTA) conference.

The E-CAT is interesting in that its design was in part spawned by concerns raised over other large high-speed vessel designs.

Designed in cooperation with the U.S. Defense Advanced Research Projects Agency MARITECH program, the twin-hulled, all-aluminum vessel is designed for cost-effective, high-speed ferrying of passengers in wake sensitive areas such as that found on rivers, waterfront environments and recreation areas.

"The flexible E-CAT design can be easily configured to meet customer requirements from 250 to 450 passengers...with speeds reaching 40 knots," said Halter Marine president and CEO John Dane III.

The prototype E-CAT particulars follow:

Length 148 ft. (45.1 m)
Width 38 ft. (11.5 m)



Halter's new E-CAT

Draft, design 4 ft. (1.2 m)
Main engines Caterpillar 3516B
Waterjets Bird Johnson
Gears Reinfjes
Range 500 nm
Classification ABS

Halter's already stellar reputation among the advanced fast ferry builders of the world has grown substantially of late, capped with the announcement that it and Empresa Nacional Bazan de C.N.M., S.A. of Madrid, Spain had formed Halter-Bazan, a joint venture to build Bazan-designed aluminum passenger/vehicle fast ferries (the Alhambra class) at the Halter facility. Construction of a 410 ft. (125 m), 1,250-passenger/240-vehicle vessel for an unnamed customer is reported to begin next month, and negotiations on a similar vessel are currently underway. Halter will also build Bazan's Mestral class.

Partnerships — on all levels of all industries — is flourishing, and the fast ferry segment of the marine market is no exception. Hellenic Shipyards Co. and Rodriguez Cantieri Navali S.p.A. signed a cooperation agreement last October which produced the framework for an agreement for the promotion and construction of the Rodriguez Cantieri Navali design hydrofoils and the Aquastrada line of ferries. The Aquastrada Ferries have proven to be exceptionally stable and productive, even in adverse weather conditions, and Hellenic is touting the vessel as not only competing with other fast ferries for the carriage of passengers, but competing with all other modes of transportation — including road and air — in delivering speed, quality and convenient travel. The Aquastrada series is equipped with the Navigation Seaworthiness Management System — a computerized stabilization system designed to reduce pitch and vertical acceleration — and the vessels maintain speeds between 40-50 knots.

Dressed To Go

Higher speeds have upped the technological ante, in terms of the

delivery of a product which will not only break records at sea trials, but remain a valuable, money-making portion of a given owner's fleet. No doubt, the stresses and strains on hull and machinery is greater at 50 knots than 20, but for seasoned maritime outfitters, it is a mere matter of engineering the solution to fit the challenge.

For example, Maritime Dynamics of Lexington Park, Md., has responded to the demand for fast speeds and light hulls by undertaking an extensive product assessment to address these concerns. The result, according to the company, is several weight saving features which will be incorporated into the company's highly regarded ride control system.

The first measure has been to design the ride control hydraulics system to operate other onboard equipment. Now Maritime Dynamics offers hydraulic packs which, in addition to the ride control system, operate the propulsion waterjet steering and reversing system. During docking operations, they can be utilized for car ramps, capstans and anchor winches. This summer, Maritime Dynamics is scheduled to install its first commercial computer-based ride control system with an embedded Microsoft Windows operating system. The system will offer touch screen operation, as well as improved diagnostics, and easy integration with alarm and monitoring systems. Maritime Dynamics ride control system references include Incat's wave-piercing catamaran Hull 050 (see story, page 37), Trico Marine's SWATH Stillwater River (see story, page 43); Derecktor Shipyard's Ernest Hemingway; and Fincantieri's Superseacat III and IV.

Litton Marine Systems scored an unusual double score this past summer, when the trans-Atlantic speed record was broken twice. Both Incat-built vessels — Catalonia which averaged 38.85 knots and Cat-Link V, which averaged 41.284 knots — featured Litton Marine System electronics. Both ships feature an integrated package of two Litton LMX 406 DGPS receivers and two HSC Decca BridgeMaster II 250 series navigation radars, which are designed specifically to meet the requirements of high-speed craft. The S-band and X-band radars are fully

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400 ft. **CMC450-10** Accommodation barge



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GREAT BOATS OF 1998

interswitched, so that they can be controlled from either the navigator's or captain's station. The ships both are fitted with Litton's advanced ISIS 250 engine monitoring, alarm and control system for the main propulsion and auxiliary systems.

Of all the systems featured onboard today's advanced fast craft, the lion's share of attention still is focused on the powerplants.

Propulsion choice — high speed diesel v. gas turbine; propeller v. waterjet, etc. — is often the subject of colorful debate at industry con-

ferences and among the various sales representatives of different manufacturers. Choice of machinery still largely depends on the operational parameters of a vessel, as well as an owner's experience with a particular brand.

On the gas turbine side, GE

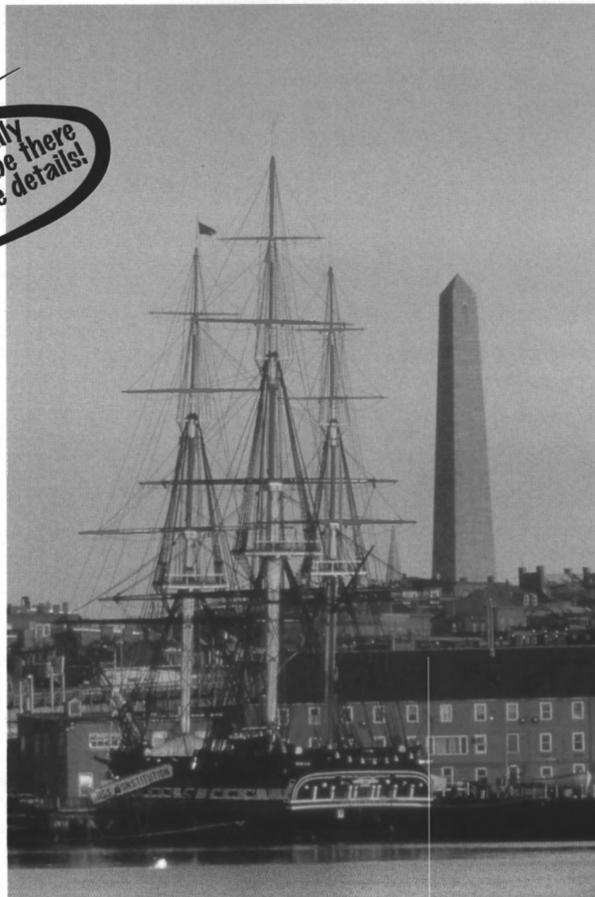


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34

Marine Engines has had good success of late with two installations aboard MDV 3000-class fast ferries for Tirrenia Lines, both of which began commercial operation this summer powered by GE's LM2500 aeroderivative gas turbines. The MDV 3000-class vessels each feature combined diesel and gas turbine configurations (CODAG) with two 22-MW LM2500 gas turbines and four 6.7-MW MTU diesel engines, for a total power output in excess of 70 MW per vessel.

Each MDV 3000 travels in excess of 40 knots carrying 1,800 passengers and 460 vehicles. Two more vessels, similarly powered, are due to come on-line this summer.

Caterpillar is, of course, no stranger to providing power for high speed performance, and the engine maker recently announced a significant upgrade of its 16-cylinder 3616 engine (pictured above) for marine fast transport. Power is now six percent higher, to 6,000 bkW at 1,020 rpm, which was accomplished without increasing peak cylinder pressure. Other improvements include smoother acceleration and improved efficiency, as well as better emission levels and increased flexibility in terms of installation. The new engine is available on a limited basis during the first three months of 1999, with full production set for the second quarter. The first vessel with the new engines will be the Armas Group 36,000 bkW ferry for service in the Canary islands. Six 3616s will drive three Lips waterjets on the Rodriguez Cantieri Navali-built ship.

At a recent industry event, Volvo Penta maintained its leadership role in the development of propulsion solutions for fast craft with its extension of its innovative series of integrated waterjet propulsion packages — which are complete with marine diesel engine, gearbox and waterjet — to 7, 12 and 16-liter diesel options. The integrated units are based on Volvo Penta's diesel engines, and Kamewa waterjets.

Maritime Reporter/Engineering News

Solar Turbines Inc. Wins Quality Award

Solar Turbines Inc., a Caterpillar Company, won the Malcolm Baldrige National Quality Award in the manufacturing category. The company is a leading maker of gas turbine engines and turbo packages.

Foss Re-Power Boosts Maneuverability

Caterpillar supplied the power for a repower and conversion of two Foss conventional twin-screw harbor tugs to azimuthal stern drive vessels. The vessels — Daniel Foss and Peter Foss, both received two electronically controlled Cat 3512B engines, rated 1,650 bhp (1,230 kW) at 1,600 rpm, which drive two Ulstein azimuthal stern drives with skewed propellers inside Nautican nozzles.

Circle 56 on Reader Service Card

Company Takes Market Share With High-Tech

The Cummins Wartsila have made quite an entrance, with the introduction of two totally new engine lines since its inception four years ago. Cummins and Wartsila are both well-known and regarded engine makers worldwide, bringing a host of technological innovation and real-world success. The cooperation to develop engines has resulted in what the company dubs the Heavy Duty Compact concept, an engine which combines the high power density and cost effectiveness of the high speed engine with the reliability and durability of the medium speed engine. The CW170 series have a 170 mm bore, with configurations of 6 and 8 cylinders in line, and 12, 16 and 18 cylinders V configuration. The range of output is 937 to 3,179 bhp, and the normal operating speed is from 1,600 to 1,800 rpm. The CW200 series — manufactured in Mulhouse, France, have a 200 mm bore and are available in 12V, 16V and 18V configurations. The output range is 2,850 to 4,890 bhp.

Stewart & Stevenson Enters Agreement On Powerhouse

Stewart & Stevenson Services, Inc. will combine efforts with Detroit Diesel and Hollywood Marine to test a new four-cycle V12-2000 series commercial

January, 1999

marine workboat engine package. Touted advantages of the compact and durable 2000 series four-cycle engine include reduced fuel and oil consumption, and quieter operation due to its triple wall exhaust system. This feature is also designed to reduce engine room heat. "The new Detroit Diesel

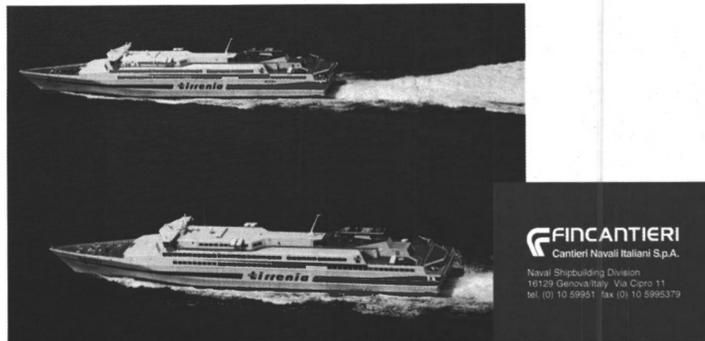
four-cycle engine is an environmentally friendly marine package which offers unsurpassed dependability, low operational costs and high customer satisfaction," said Don Gollott of Stewart & Stevenson's marine engine sales. "The 2000 series reduces the rpm and achieves the desired tow

speed, plus reduces the fuel burn. On average, the engine's rpm hit 1,600 when using about 16 gallons per engine per hour and running just under eight miles per hour, all the while pushing 60,000 barrel tows," said Willie Monson, Hollywood Marine.

Circle 52 on Reader Service Card



F I N C A N T I E R I I S
B U I L D I N G F O R T H E S E A



The new Fincantieri MDV high-speed ferries are revolutionizing medium-range connections, allowing passengers and their cars to halve crossing time. These monohull ferries of several sizes, built both of light alloy and steel, reach a speed of 40 knots and are capable of accommodating up to 1,800 passengers on board, with up to 850 cars. The design for these new high-speed vessels has been developed out of the experience gained from an exceptional test bench: The victorious challenge of the "Destriero", the record-ship built by Fincantieri, which won the Blue Riband for the Atlantic crossing in less than 59 hours at the exceptional average speed of 53 knots, with peaks of over 60 knots.

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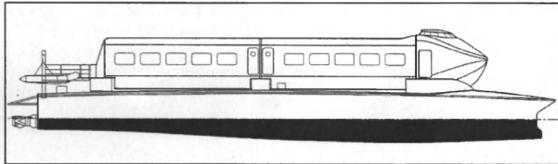
GREAT BOATS OF 1998

On The Cover

Shipbuilder IRIS Catamarans
 Vessel Name IRIS 6.1
 Vessel type Modular
 pass. catamaran
 Owner/
 operator TMCA, Guadeloupe

IRIS 6.1 is the result of four

years of testing and experimenting, beginning in 1994 when the first design specifications were discussed. The team at IRIS Catamarans aimed for a high level of seaworthiness, the capacity to generate a low wake at all speeds with respect for the environment



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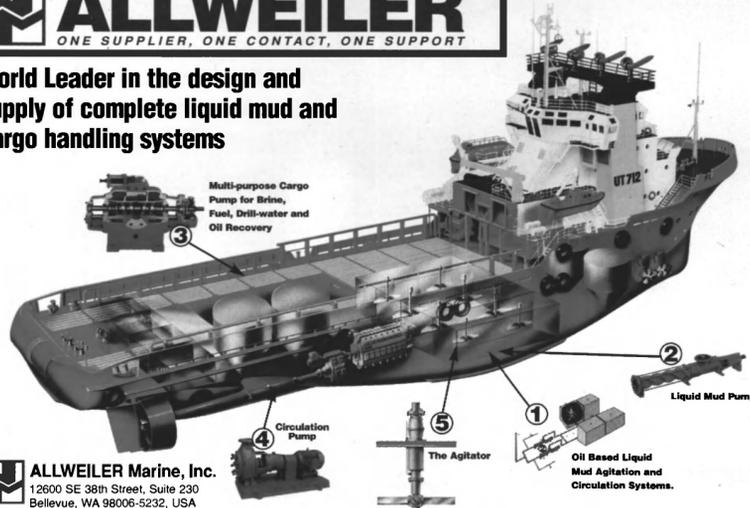
Development: Boston
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in mind, and good overall performance. In 1995 several configurations were put through tests for speed, seaworthiness and wake at the tank-testing facilities of MARIN (Maritime Research Institute Netherlands) in Holland to determine the best overall solution. Scale models at one tenth of the true size were tested in the tanks throughout 1996 - both driven in calm waters and self-propelled in wave tanks. The process was finalized with sea trials in February 1998. The catamaran, both hulls and modules, is constructed primarily of GRP Sandwich, a material that lends itself well to keeping the vessel weight at a minimum. The transverse beams are made of aluminum, and are joined to the hulls on heavily reinforced double watertight bulkheads. IRIS 6.1 has been acquired by TMCA of Guadeloupe to be used as an inter-island shuttle service between Pointe-a-Pitre, Marie Galante, and Les Saintes. This alternative to the usual transport by plane allows passengers to spend less than 40 minutes travelling from Pointe-a-Pitre.

Circle 26 on Reader Service Card

IRIS 6.1 Main Particulars

Classification	Det Norske Veritas
Length, o.a.	140 ft. (42.7 m)
Length, waterline	130.2 ft. (39.7 m)
Beam overall	34.8 ft. (10.6 m)
Draft	5.2 ft. (1.6 m)
DWT	51
Passengers	240
Speed, fully loaded	29.9 knots
Speed, maximum	34.2 knots
Range	10 hours
Fuel capacity	7 tons
Fresh water capacity	1.2 cu. m.
Main engines	2 x MTU 12V 4000 M 70
Hulls, modules, command head	GRP - Sandwich
Beams	Aluminum

Shipbuilder Incat
Vessel Name Incat 050
Vessel type High Speed Passenger

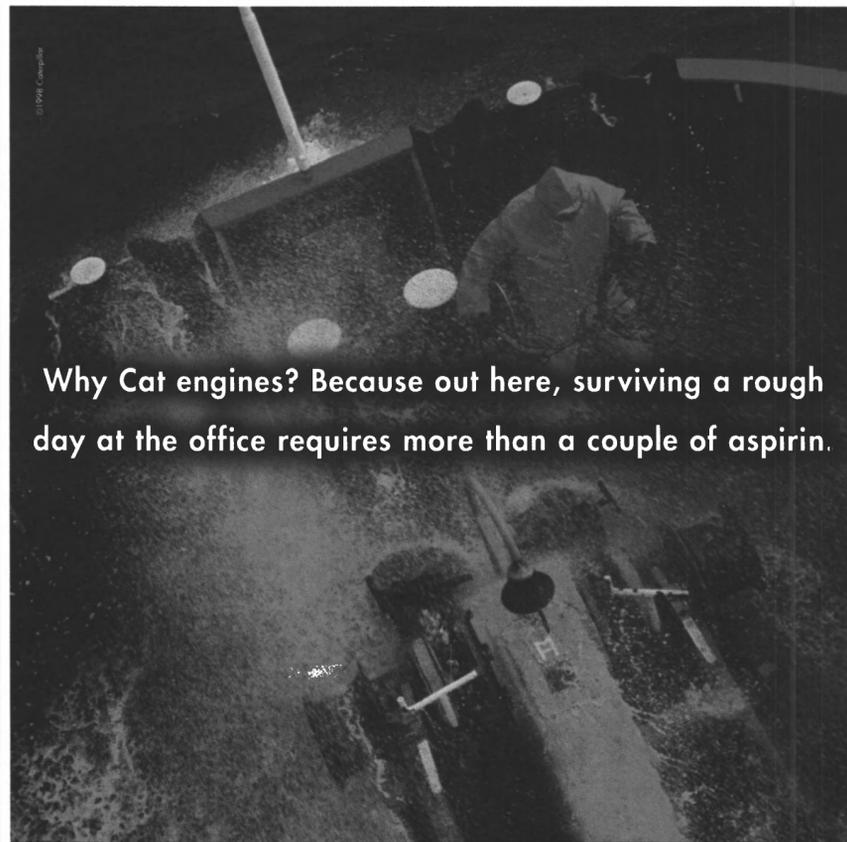
Incat 050 wearing the distinctive Devil Cat livery is the first of Incat's innovative 96 m class. With an impressive 800 ton dwt capacity and the ability to carry a highway mix of vehicles, the 96m offers market and seasonal flexibility. Devil Cat is the first in a new series from Incat.

The wave piercing catamaran has been developed by Incat Australia over the past 15 years. Each wave piercing hull is divided into multiple watertight compartments with minimum forward buoyancy. These are connected by an arched bridging structure with a central forward hull above the loaded water-line which offers reserve transitional buoyancy for control of excessive bow down pitching. As each hull encounters a wave it tends to pierce through rather than ride over. After detailed analysis of sea states, routes, operating envelopes and on board motion data Incat, in conjunction with Maritime Dynamics Inc. have further enhanced the proven fully integrated Ride Control System which incorporates active aft trim tabs and active forward T foils. Each control surface responds independently to a computer which receives information from strategically placed motion sensors. With the ability to almost anticipate the vessels next move the system dramatically reduces pitch, roll and heave, the major contributors to motion discomfort.

Incat's In-House Design Group and master craftsmen have produced a stylish, luxurious yet practical interior that is well suited for the demands of an intensive passenger ferry service. All interior materials, including seats, carpet and wall coverings are selected not only to complement each other to produce an integrated and harmonious interior, but also to comply with the most stringent IMO stan-



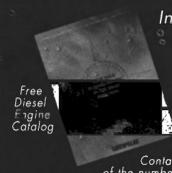
dards for fire, smoke and toxicity. The use of flexible, rubber mounts between the superstructure and ship's hull ensures a minimum of noise and vibration permeates the climate controlled passenger cabin, maintaining an atmosphere of relaxation and comfort. Up to 600 persons are catered for using a combination of airline, cafe and couchette style seating.
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Why Cat engines? Because out here, surviving a rough day at the office requires more than a couple of aspirin.

Principle Particulars

Classification	DNV
Ride Control	Maritime Dynamics Inc.
Speed@Lightship condition	50+ knots
Speed with deadweight @800 tons	37.5 knots
Length, o.a.	314.9 ft. (96 m)
Length, waterline	282 ft. (86 m)
Beam, o.a. (excluding fenders)	85.3 ft. (26 m)
Draft	12 ft. (3.7 m)
Hull beam	14.7 ft. (4.5 m)
Total deadweight	800
Power	(4) Caterpillar 3618 rated @ 7,200 kW
Waterjets	Lips 150D
Passengers	600 total persons



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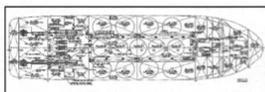
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CATERPILLAR

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GREAT BOATS OF 1998

Bender Shipbuilding's Agnes Candies



Agnes Candies is the first of four vessels being built for Otto Candies, Inc. by Bender Shipbuilding & Repair Co. The vessel is a new generation offshore oilfield supply boat, designed and equipped with systems and equipment to

more efficiently and safely carry out its supply and service mission. The vessel is U.S. flagged, and will be crewed by U.S. citizens and is certified to USCG, ABS and SOLAS regulations.

The design of the vessel was performed by Bender, in consultation with Otto Candies, Inc. The engineering and construction of the vessel amounted to more than 4,500 man weeks of labor. The two-year construction period for the first four vessels will require employment of more than 250 shipyard workers at Bender's Mobile, Ala. shipyard.

Circle 65 on Reader Service Card

Vessel Specifications	
Shipbuilder:	Bender Shipbuilding & Repair, Mobile, Ala.
Owner/Operator:	Otto Candies, Inc., Des Allemands, La.
Flag:	U.S.
Classification:	ABS
Length, o.a.:	220 ft. (67 m)
Breadth, molded:	54 ft. (16.5 m)
Draft (scantling):	16 ft. (4.8 m)
Total Fuel Oil:	210,920 gal.
Propulsion Engines:	(2) EMD 16-645E6
Z-drive Units:	(2) KaMeWa Aquamaster, U.S.-2001
Propulsion Controls:	KaMeWa Aquamaster
Main Engine Grid Cooler:	(2) Fernstrum
Genset Grid Cooler (250 kW):	(3) Fernstrum
Keel Coolers:	(3) Fernstrum
Bowthruster engines grid coolers (tunnel):	(2) Fernstrum
Mufflers:	(8) Maxim MSA-2
Diesel Generator Set:	(3) Detroit Diesel 12V-71N
Emergency Diesel Generator:	Detroit Diesel 4-71N
Air Horn:	Kahlenberg Model No. D2, Figure 232
Compass:	Danforth -824-B
Machinery Alarm & Monitoring System:	GMG/Marine Interface
Fire & Smoke Detection:	Hiller
Data Collection System:	GMG/Marine Interface
Integrated Control System:	Nautronix
Bilge/Ballast Pump:	(2) Worthington D-324
Oil/Water Separator:	Nelson Bilge Boy #10025
Grid Cooler, Bulkhead Compressor:	(2) Fernstrum
Hotwater Heaters:	(2) Rheem E-85-18-G
Hotwater Heaters:	(2) Rheem EGSP10
Ultra Violet Purifier:	Ultra Dynamics Model 3500B
Cargo Fuel Pump:	Worthington Model D824
Fuel Oil Centrifuge:	Alfa-Laval MAB 104
Cargo Fuel Meter:	Barton Model #7401
Agitators:	(8) Flygt Mixer Type 4660
Air Compressor:	Quincy Model D370L
Anchor Windlass:	McElroy Model MDW-150/OSV

Blount Industries' M/V Grande Mariner

Blount Industries newest cruise ship, M/V Grande Mariner, was built for American Canadian Caribbean Line, Inc. It is the second in a new line of Grande Class small cruise ships, built and designed for the American Canadian Caribbean Line, Inc. The 183 ft. ship

accommodates 100 passengers, and is designed with several ACCL innovations, including patented bow ramp, shallow draft and retractable pilot house. Grande Mariner also features super-quiet engines and generators, ice-strengthening and a specially designed clear air system.



The ship's hull is steel constructed with an aluminum superstructure. It is powered by two D2842LE Man diesel engines, producing 1,440 bhp @ 1,800 rpm. The engines turn two five-blade 48 x 39 in. propellers, through Twin Disc MG-5202 gears, with a 2.92:2 reduction, achieving a service speed of 10 knots.

Circle 66 on Reader Service Card

Vessel Specifications	
Shipbuilder:	Blount Industries, Warren, R.I.
Owner/Operator:	American Canadian Caribbean Line, Inc.
Length (Overall):	183 ft. (55.7 m)
Beam:	40.8 ft. (12.4 m)
Depth:	9 ft. (2.7 m)
Design Draft:	6.5 ft. (1.9 m)
Passenger Capacity:	100
Main Propulsion:	(2) Man D2842LE 710 hp @ 1,800 rpm
Marine Gear:	(2) Twin Disc MG-5202 2.92:1 reduction
Propellers:	(2) Ellis, bronze 5-blade 48 x 39 in.
Ship's Service Power:	(3) Caterpillar 3306 170 kW generators
Bowthruster:	Wesmar
Engine Controls:	Mathers Micro Commanders
Steering System:	Wagner Hydraulic
Speed, service:	10 knots

Bollinger's USCG Patrol Boats

The 87 ft. Coastal Patrol Boat (CPB) is a new multi-missioned class of vessels capable of performing search and rescue, law enforcement, fisheries patrols, drug interdiction and alien interdiction duties up to 200 miles offshore. The vessel was designed and built by Bollinger Shipyards Lockport, L.L.C., and is based on the Damen STAN 2600. BSI has a contract to construct 22 vessels, with options to build up to 51 vessels. The new fleet of USCG vessels will be referred to as the Marine Protector Class and has been designed as a replacement for the aging 82 ft. Point Class of cutters.

The CPB is designed to accommodate a crew of 10 for a five-day mission. Internal arrangements include four two-man staterooms and one three-man stateroom, an office, separate galley and mess, two heads, two showers and a bridge with 200 sq. ft. of usable area, and 360 degree visibility. The CPB is capable of achieving a maximum continuous speed of 25 knots



and has a patrolling speed of 10 knots.

One unique feature is the RIB launch and recovery system. This design includes a fixed ramp incorporated into the stern of the CPB, allowing the "daughter" vessel to drive into the "mother" ship while underway. This feature significantly improves the safety of the crew by eliminating the need for a deck-mounted davit.

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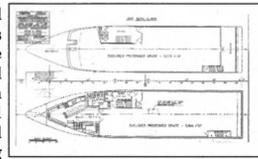
Vessel Specifications	
Shipbuilder:	Bollinger Shipyards Lockport, L.L.C., Lockport, La.
Owner/Operator:	USCG
Flag:	U.S.
Length, o.a.:	87 ft. (26.5 m)
Length, b.p.:	82 ft. (24.9 m)
Breadth, molded:	19.5 ft. (5.9 m)
Displacement:	89.5 mt
Lightweight:	75.4 mt
Draft (design):	5.8 ft. (1.7 m)
Speed, Service:	25.3 knots
Bunker:	2,800 gal.
Fuel Consumption:	170 gal./hr.
Main Engines:	MTU 8V 396 TE94
Total hp:	2,950
Propellers:	Five-bladed fixed pitch
Generator Engines:	MAN D0824 LF01
Generators:	(2) 60 kW Stamford Newage
Reduction Gears:	(2) 2F BW 255
Engine Controls:	MTU RCS-5
Steering Controls:	Kobelt
Deck Machinery:	Lewmar Anchor Windlass
Shafting:	Four in. Aquamet 17
Bearings:	Thorndon
Coatings:	International
VHF Radio:	Ross DSC-500
SSB Radio:	Sunair
Compass:	Gyrocompass Standard 20
GPS:	Raytheon 398
Autopilot:	Raytheon Pilot Star D
Pumps:	Grunfos
Air Conditioning:	Novenco
Desalination Equipment:	Village Marine

Chesapeake Shipbuilding's Ugly Duck

M/V Ugly Duck began construction as a typical dinner/excursion vessel for Maritime Equipment Co., of Haddam, Conn. While the hull erection was in progress, Premier Yachts, Inc. of Chicago purchased the contract from Maritime Equipment and began converting the vessel's plans into a more upscale and unique arrangement.

The vessel features a full galley, plus bar and wait station on the main deck forward, allowing maximum deck space aft for two curved buffet tables, DJ booth and dance floor. Having the galley forward also allows large tinted insulated glass windows across the stern of the vessel and along both sides. Special vibration and sound dampening methods are utilized to almost eliminate engine and propeller noise in the dining area.

The second deck features another bar and wait station, plus a buffet



Maritime Reporter/Engineering News

table, DJ booth and dance floor. An open deck aft doubles as a boarding station and covered observation deck. The third deck has a private party dining room with its own full bar and wait station, plus a 270 degree panoramic view out the double-glazed tinted windows and direct access out onto the exterior deck.

The fourth deck is a wide-open observation area, providing passengers a viewing platform some 35 ft. above the water line.

Other features include two storerooms below the main deck with walk-in reefer and freezer, and a closed-circuit TV system, so passengers can observe the dance floor from anywhere on the boat.

Circle 68 on Reader Service Card

Vessel Specifications

Shipbuilder:	Chesapeake Shipbuilding Corp.
Owner/Operator:	Premier Yachts, Inc., Chicago
Flag:	U.S.
Classification:	USCG Subchapter "K"
Length, o.a.:	160 ft. (48.7 m)
Length, b.p.:	138.9 ft. (42.3 m)
Gross Tonnage:	949
Draft (design):	7 ft. (2.1 m)
Speed, Service:	12 knots
Main Engines:	Detroit Diesel 12V71N
Total hp:	1,000
Propellers:	44 in. Michigan Wheel Nibral, Dyna-Quad
Thrusters:	Schottel ST-060, 170 hp, 630 MN Diam.
Generator Engines:	Detroit Diesel 6-71T, 180 kW
Thruster Drive:	Reliance SCR Drive
Generators:	(2) @ 180 kW
Fin Stabilizers:	Bilge Keels
Reduction Gears:	Twin Disc MG-514
Engine Controls:	Kobelt Electronic
Steering Controls:	Kobelt Dual Pump Elect./Hyd.
Shafting:	Aquamet 17
Coatings:	International
VHF Radio:	ICOM
Radar:	Furuno

Dakota Creek Shipyard's Nanuq

Nanuq, the first of two 153 ft., 10,192 hp enhanced tractor tugs has been launched from Dakota Creek Shipyard, in Anacortes, Wash. Nanuq and sister vessel



January, 1999

Tan'erliq (Alaska native words for 'polar bear' and 'black bear,' respectively) have been specially designed and developed for Crowley Marine Services (CMS) under contract with Alyeska Pipeline Company for tanker escort operations in Valdez Harbor

and Prince William Sound, Alaska. Nanuq is powered by two Caterpillar 3612 engines driving twin Voith Schneider cycloidal propulsion units. Both vessels will be outfitted for tanker escort services, ship handling, firefighting and emergency and spill response

in Alaskan waters. Design features include a hydrofoil-shaped skeg, welded steel construction, transverse framing, wing tanks and ice belting. Naval architects for the project were Guido Perla & Associates, Seattle.

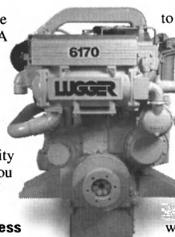
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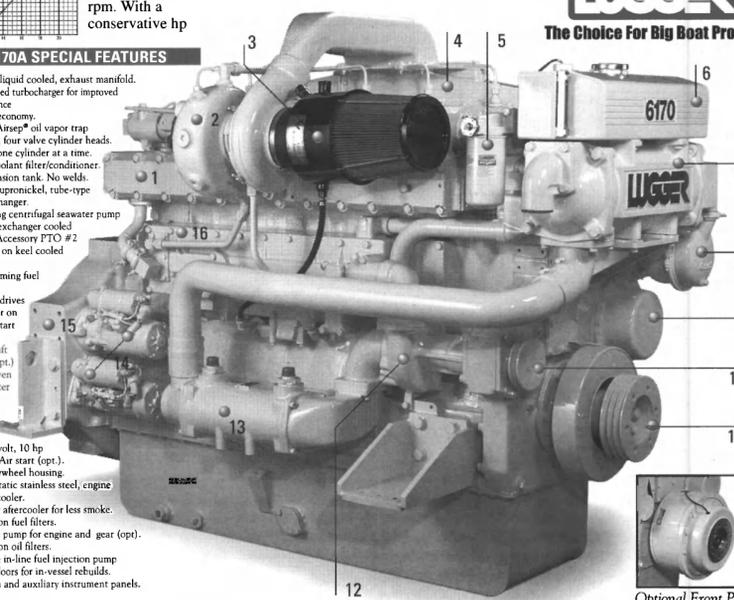
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 - Gear-driven fresh-water coolant pump.
 - Gear oil cooler.
 - Dual 24 volt, 10 hp starters. Air start (opt.).
 - SAE-0 flywheel housing.
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- Freshwater aftercooler for less smoke.
 - Dual spin-on fuel filters.
 - Oil change pump for engine and gear (opt).
 - Dual spin-on oil filters.
 - Bosch-type in-line fuel injection pump
 - Oil sump doors for in-vessel rebuilds.
 - VDO main and auxiliary instrument panels.



Optional Front PTO

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GREAT BOATS OF 1998

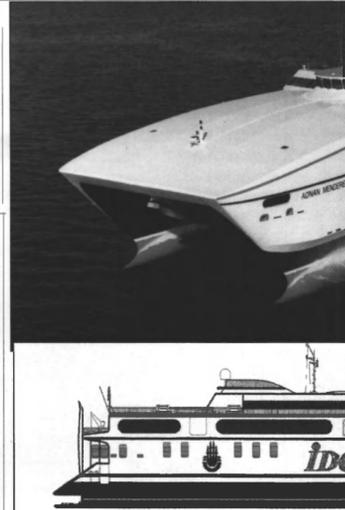
Shipbuilder Austal Ships Pty Ltd.
Vessel name Adnan Menderes
Vessel type High-speed vehicle-passenger cat
Owner/Operator Istanbul Deniz Otobusleri

Representing the third genera-

tion in Austal Ships' successful range of Auto Express vehicle-passenger catamarans, 284 ft. (86.6 m) Adnan Menderes is the first of two vessels built for a leading Eastern Mediterranean operator, Istanbul Deniz Otobusleri. At its debut, the catamaran achieved a

speed of 42 knots at 340 dwt.

Adnan Menderes was delivered in June 1998 to begin sailing the 65 nautical mile route between the Turkish ports of Yenikapi and Badirma. With the vessel's operating environment across the Marmara Sea typically producing



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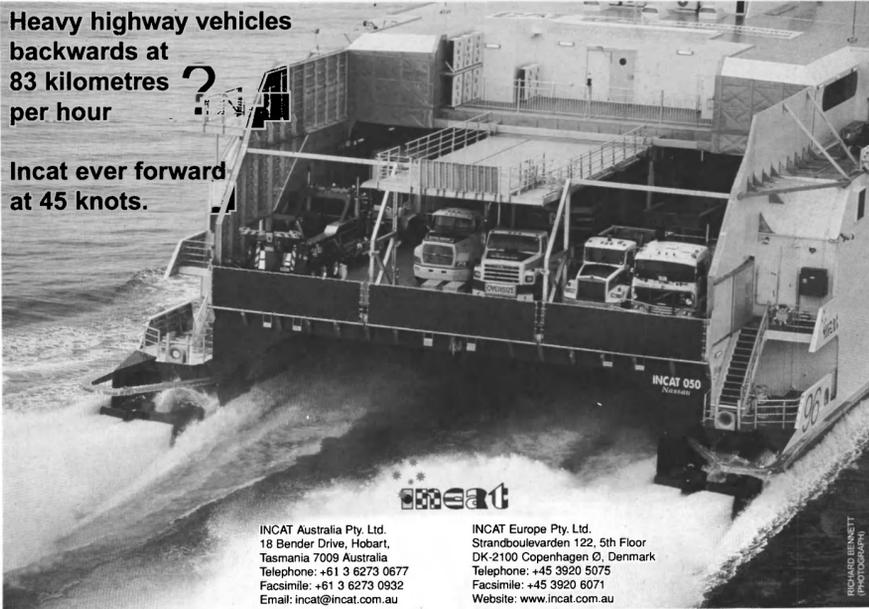
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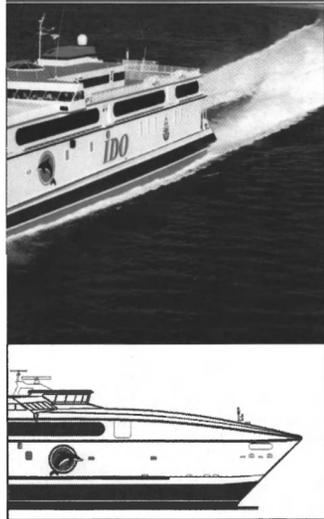
waves up to two meters significant, Austal's Ocean Leveller ride control system has been fitted to further enhance passenger comfort. Featuring T-foils forward and interceptors aft, Adnan Menderes is the first of Austal's 80 m range catamarans to feature these variable interceptors.

The vessel has a car carrying capacity of 200, or it can accommodate 10 buses and 75 cars. The nine main deck lanes and six mezzanine deck lanes are accessed through a 32 ft. (9.85 m) long stern ramp. Vehicles load via the stern ramp and exit on the same ramp after completing an on-board U-turn. The vessel's 800 passengers are accommodated on two decks, in a design that allows up to 1,700 sq. m. of public space. On-board features include a restaurant, buffet and bar/kiosks, shopping arcade, children's play area, and male and female prayer rooms. The wheelhouse is dual level and features 360 degree vision as required by the IMO HSC code. Docking can be achieved either centrally, or from the wing stations. Electronics featured in the wheelhouse include Racal Decca radars and navigational equipment, electronic chart navigation, GMDSS A2 communication system and Satcom B communication.

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Main Particulars

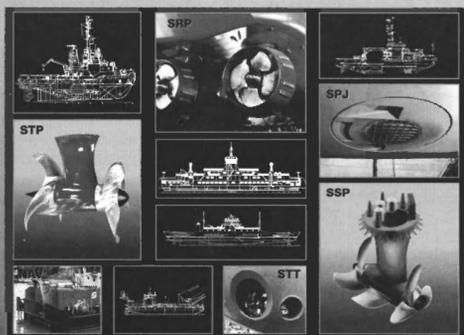
Designer Austal Ships
 Classification Germanischer Lloyd
 Contract date December 1997
 Launch date April 1998
 Delivery date June 1998



Length, o.a.	284 ft. (86.6 m)
Length, waterline	243.4 ft. (74.2 m)
Beam, moulded	78.7 ft. (24 m)
Depth, moulded	24 ft. (7.3 m)
Draft, design	10.5 ft. (3.2 m)
Draft, scantling	13.5 ft. (4.1 m)
GT	5992
Displacement	1,210 tons
Lightweight	870 tons
DWT	400 tons
Speed, 100% MCR	42 knots
Speed, service	40 knots
Fuel consumption at 90% MCR	5 tons/hr
Fuel	70,000 L
Passengers	800
Vehicles	200 cars, or 75 cars & 10 coaches
Crew	30
Bunker	164,000 L
Main engines	4x MTU 20V 1163 TB73L
Total HP	26,000 kW
Waterjets	Kamewa
Generator engines	4x MTU 8V 183 TE52
Generators	Newage Stamford
Motor starters	Air
Ride control	Austal "Ocean Leveller"
Couplings	Geislinger
Reduction gears	Reintjes
Steering controls	Kamewa

Shafting	Geislinger	Pumps	TPS
Bearings	Cooper	Heat exchangers	Alfa Laval
Coatings	International	Air conditioning	Austal Ships
VHF radio	Sailor	Lifeboats	Zodiac
SSB radio	Sailor	Liferafts	Liferaft Systems Australia
Compass	C-Plath	Davits	Schat Harding
GPS	Phillips	Fifi system	Austal Ships
Autopilot	C-Plath	Waste management system	Jets
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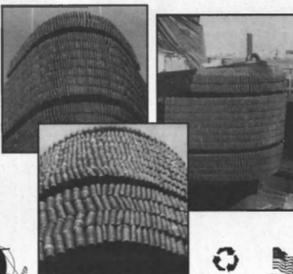
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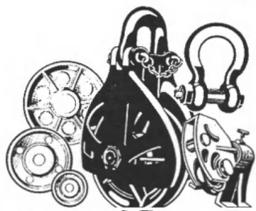
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GREAT BOATS OF 1998

Halter Marine's St. Johns



Halter Marine Group delivered St. Johns, the second in a series of three revolutionary Ship Docking Modules (SDM) to Hvide Marine, Inc. Now in service at Tampa Bay, Fla., the vessel follows the first Halter-built SDM, New River. The patented 90 x 50 ft. SDM design, which requires only two crew members to operate, was conceived by Erik Hvide, chairman and president of Hvide Marine, Inc., and refined by the Elliott Bay Design Group. The double-ended, 4,000 hp harbor tug has skegs mounted on each end, featuring Z-drives mounted forward and aft and offset 6.5 ft. from the center to provide 100 percent of its bollard pull in any direction. It can move sideways with a maximum draft of 16.2 ft., or just 5.2 ft. on the hull and 11 ft. on the skegs. Protecting the saucer-shaped SDM is a 45,000 lbs. Schuyler fender system.

Circle 70 on Reader Service Card

Halter Marine's Kennicott

Kennicott, the first U.S.-flagged, ocean-going passenger ferry built in decades was delivered to the state of Alaska by Halter Marine Group. The \$80 million, 381 x 85 ft., 17.5 ft. draft ferry, can carry 748 passengers on day cruises, or 500 overnight cruise passengers. It is the first vessel in the Alaska Marine Highway System fleet of nine ships capable of operating on all routes between Bellingham, Wash. And Dutch Harbor in the Aleutian Islands.

The 12,635 gt ferry, which displaces 6,000 tons, has more than 100 staterooms providing at least 314 berths with three classes of cabins: first class, tourist class and roomettes.

The ferry features a RoRo design with a vehicle deck capable of carrying 120 cars or a mix of 39 cars and 20 45-ft. highway trailers. It is equipped with a fully enclosed 40-ton vehicle elevator, side doors and a stern ramp.

Powered by two Wartsila diesel engines developing a total of 13,380 hp, which provide a service speed of 16.75 knots and a maximum speed of 19 knots. Maneuverability is aided by a 2,113 hp bowthruster. Generators include two 2,400 kW power takeoff, two 1,440 kW diesel generators and a 385 kW emergency generator.

Circle 71 on Reader Service Card

Maritime Reporter/Engineering News



Eastern Shipbuilding's M/V Stillwater River

Stillwater River is the first advanced high-speed crew boat using the SWATH (small water plane area twin hull) technology. The all-aluminum vessel was designed specifically as a crewboat for operation in the Campos Basin offshore Brazil with a capacity for 250 passengers.

Owned by TRICO Marine Services, Stillwater River is 120 ft. in length, and operates at a loaded draft between 11 and 12 ft. It is particularly suited for high-speed transportation of offshore rig personnel to and from platforms in the rough waters of Campos Basin.

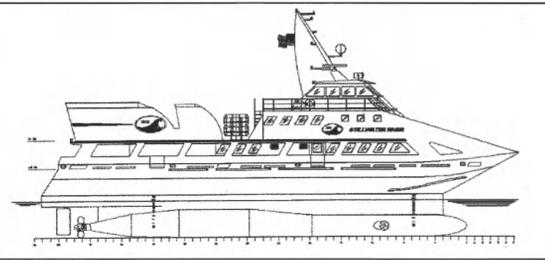
The SWATH design produces slower motions, less likely to cause passenger discomfort due to the fact that the portion of the hull that gives displacement, rides below the surface of the ocean.

During sea trials, the vessel reached a trial speed of 31 knots. Power is provided via a pair of Allison 501 KFS gas turbines, which produce 9,600 total hp. Reduction is provided through a pair of custom-built Philadelphia Gear Model HP-25 gearboxes with 28:1 ratios, that also furnishes power for an assortment of other

ships systems, including controls and shaft lubrication systems.
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Vessel Specifications

Shipbuilder: Eastern Shipbuilding
Group/Owner/Operator: TRICO Marine Services
Flag: U.S.
Classification: ABS
Length, o.a.: 119.5 ft. (36.4 m)
Breadth, molded: 43.7 ft. (13.3 m)
Gross Tonnage: ITC Gross 537
Lightweight: 219 lt
Draft (design): 9.8 ft. (2.9 m)
Speed, Service: Design Speed 28 knots
Complement: Crew 5, Passengers 250
Water Ballast: 26,500 gal.
Main Engines: Allison 501 KFS
Total hp: 11,600
Propellers: LIPS Controllable Pitch Propellers
Thrusters: 200 hp Holland Propeller
Generator Engines: (2) Cummins
Thruster Engines: 200 hp Electric Motors Baldor
Generators: Stamford 315 kW
Motor Starters: Square D
Fin Stabilizers: Maritime Dynamics, Inc.
Couplings: SKF
Reduction Gears: Philadelphia Gears
Engine Controls: LIPS
Steering Controls: LIPS/Hydraulic System by Huber
Deck Machinery: McElroy Anchor Winch
Shafting: LIPS
Bearings: Thordon
Coatings: International
VHF Radio: Sea Model 7156
SSB Radio: Sea Model 330
Radar: Simrad ARPA Interface
Compass: Gyro Compass - Sperry SR 180
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43

Jeffboat's Santa Elena

Jeffboat has launched a new 4,200 hp inland river towboat christened Santa Elena. Designed to carry a crew of 16 for shallow draft operations, the vessel was built by Jeffboat for American Commercial Line's South American operations. The vessel may operate on the Ohio and Mississippi Rivers for some period of time before being shipped to South America.

Power is provided by a pair of EMD 12-645E7 engines, coupled to Haley reduction gears and 100-in. five bladed propellers in custom fabricated Kort Nozzles. The boat has two 150-kW generators driven by Detroit Diesel 8V-71 engines. Fuel capacity is 70,000 gal. Water capacity is 18,000 gal.

The boat has a design draft of 8.25 ft. and the maximum height is 42.5 ft. above the waterline. Outfitting includes Furuno radars and fathometer, Zealand swingmeter and autopilot, Nabrico winches, and a Schoellhorn Albrecht capstan.

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January, 1999



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GREAT BOATS OF 1998

Shipbuilder Kvaerner Masa-Yards
Vessel name Superfast III, IV
Vessel type Vehicle-passenger RoRo ferry
Owner/Operator Attica Enterprises S.A.
Ship manager Superfast Ferries



In early 1998, Kvaerner Masa-Yards' Turku New Shipyard delivered two fast vehicle-passenger ferries to Attica Enterprises S.A. for use in the Patras, Greece to Ancona, Italy route. The ferries are designed to maintain a regular 48-hour round trip with a service speed of 28.5 knots.

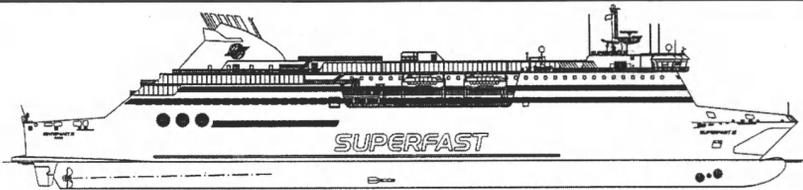
Superfast Ferries, Attica Enterprises' ship managers for the newbuildings is a leading operator of passenger-car ferries between Greece and Italy with two ferries in operation, Superfast I and II. Superfast III and Superfast IV are larger than their predecessors with an overall length of 637.5 ft each. They can hold a total of 1,400 passengers, with accommodation space for 750 in 222 cabins. Each vessel features two restaurants, a disco, a casino, three bars, a boutique, children's play room and a swimming pool. Vehicle capacity for the vessels is 160 cars and 122 trailers on four fixed and two hoistable car decks which are reached by ramps.

The vessels are equipped with fin stabilizers, two bow thrusters and one stern thruster. The total main engine power, supplied by four 10,560 kW Wartsila NSD 16ZAV40S diesel engines, is 42,240 kW. The engines are geared to twin shafts and CP propellers.

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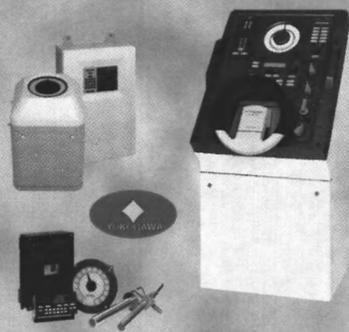
Main Particulars	
Classification	ABS
Length, o.a.	637.5 ft. (194.3 m)
Length, b.p.	577 ft. (176 m)
Breadth, molded	82 ft. (25 m)
Draft, design	21 ft. (6.4 m)
Draft, scantling	21.3 ft. (6.5 m)
DWT	5,600 tons
Speed, service	28.5 knots
GT	29,000
Passengers	1,400
Cars	160
Trailers	122
Main engines	4x Wartsila NSD 16ZA V40S ERI
Roro equipment	MacGregor
Passenger cabin units	KMY Piikkio Works

January, 1999



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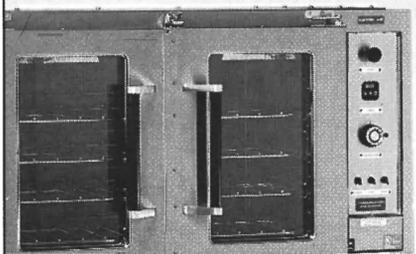
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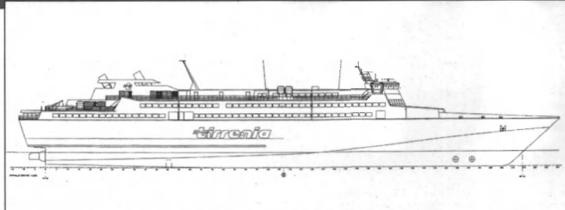
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Shipbuilder Fincantieri
Vessel name Ariès
Vessel type Fast RoRo Pax
Owner/operator Tirrenia

Ariès, built by Fincantieri, is the first of a series of four MDV3000 Jupiter monohull fast ferries ordered by Tirrenia. During sea trials the 476 ft. (145 m) vessel reached a speed in excess of 45 knots in light conditions and at 100% MCR rating.

The carrying capacity at a service speed of over 40 knots is 1,800 passengers and 460 cars. Moreover, the three garage decks can be loaded simultaneously for fast harbor turnaround time. With hoistable car-deck modules, the transport capacity can be altered to reflect fluctuations in passenger and car service needs from tourist season to low season and at night.

Ariès and her sister ship Taurus have been built in high tensile steel with superstructures in aluminum alloy. Four diesel engines and two gas turbines supply power at 95,000 hp. In June 1998 the vessels joined the route between Civitavecchia (Rome) and Olbia (Sardinia).

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Main Particulars

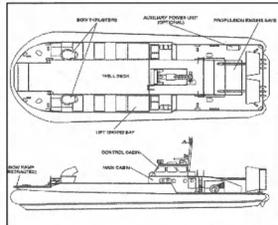
Classification	ABS, RINA
Flag	Italy
Length, o.a.	477.6 ft. (145.6 m)
Length, b.p.	422 ft. (128.6 m)
Breadth	72 ft. (22 m)
Depth	85 ft. (26 m)
DWT, freight	1,200 tons
DWT, pax	805 tons
Speed, service	40.5 knots
Passengers	1,800
Cars	460
Auxiliary engines	Deutz
Steering water jets	KaMeWa
Booster water jets	KaMeWa
Bowthrusters	Fincantieri
Stabilizers	Vosper, Fincantieri
Interior architect	de Jorio
Air condition	Novenco Hi-Pre
Access equipment	ISO
Marine escape system	Viking
Escalator	OTIS
Integrated propulsion	FiatAvio SEPA
Air seats	Geven
Panels	Metalleido
Aluminum structures	Alusuisse
Gear	MAAG
Cranes	Pellegrini
Lifesaving equipment	Viking
Vibration damping	de Martini

**Subcontractor/
licensee** Hike Metal Products
Vessel name Sipu Muin
Vessel type Hovercraft
Owner/operator Canadian Coast Guard

In April, the Canadian Coast Guard received the first of two new amphibious hovercrafts built by GKN Westland Aerospace (GKNWAE) of the U.K. The new type of craft, called the Dash 400, can undertake the duties required of a workboat, but reportedly at less cost and with improved performance. The Dash 400 can operate on and off beaches, making most areas accessible and avoiding the cost of harbor facilities; can travel over both deep and shallow water, mud, marshland, sand, ice, and snow; has high speed and work capacity; and is unaffected by underwater obstructions.

The Dash 400 makes use of an air cushion with a mean depth of 4.6 ft. (1.4 m) between the underside of the hull and the surface below. The cushion is contained beneath the craft by a flexible skirt system around the hull. The craft can be operated by one crewmember, but a radar operator/navigator is normally onboard.

The Canadian Coast Guard's Dash 400 has been named Sipu Muin. It is of the half well deck configuration, although Dash 400s are also available in long well deck. Sipu Muin can be used for a wide variety of roles, including search and rescue, casualty evacuation,



Main Particulars

Designer GKN Westland Aerospace
Flag Canada
Delivery date April 1998
Length, o.a. 93.5 ft. (28.5 m)
Breadth over inflated skirt 39.4 ft. (12 m)
Lightweight 43,000 kg
DWT 27,000 kg
Speed, service 50 knots
Cargo capacity 20,000 kg
Bunker 11,000 L
Fuel consumption 615 L/hr
Main engine mfr. Caterpillar, 3412 TTA
Propellers Hoffman
Generator engines Lister-Petter
VHF Radio Northern Airborne Technologies
Radar Furuno
Compass Sperry
GPS Leica
Air conditioning Anex
Removable sea crane Palfinger
Winch, Capstan North Sea Winches

flood relief, ice breaking, fire fighting and oil spill control. The hovercraft joined its predecessor the AP1-88 half well deck craft, also built by GKNWAE, working in the St. Lawrence Seaway. It is powered by four Caterpillar 3412 TTW water-cooled diesel engines, each developing 671 kW. Two of the engines are used for lift and two for propulsion.

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Guido Perla & Associates has been designing profitable working vessels since 1979. A full-service naval architecture, marine engineering, and project management firm, GPA has extensive experience in design and construction of a variety of vessels. Working vessel experience includes all types of fishing vessels (including the largest factory trawler in the United States), offshore supply and anchor handling vessels, escort and harbor tug.

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- Regulatory agency liaison



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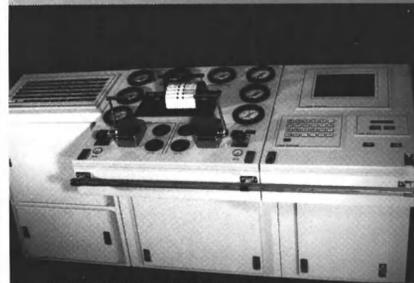
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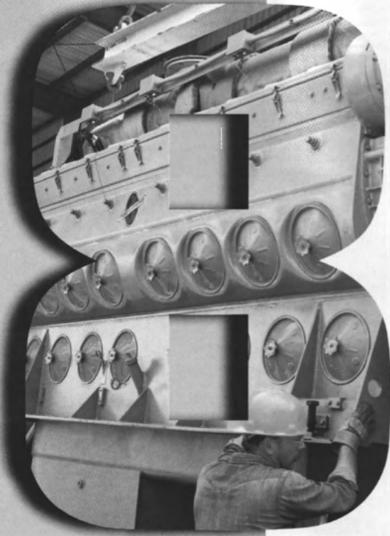
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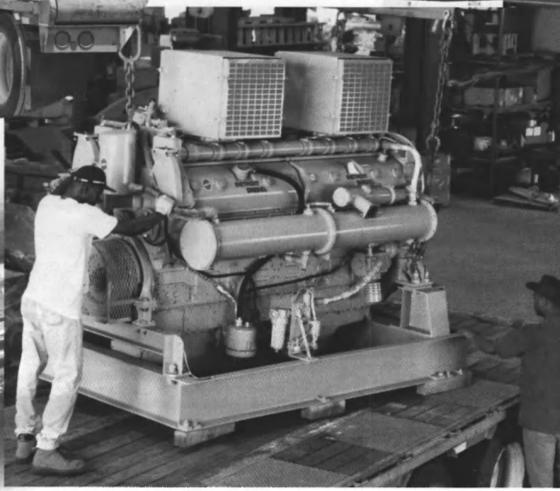
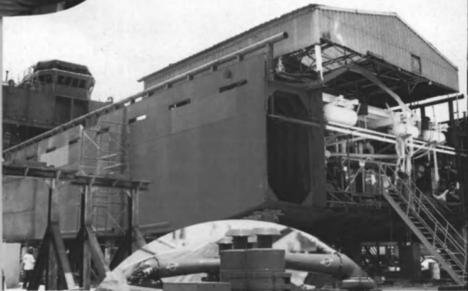
Otto Candies, Inc.



**Motor Vessel
"Agnes Candies"**

- 220 feet long x 54 wide
- Bender Shipbuilding & Repair Inc.,
Mobile, AL
- Built 1998
- Owner: Otto Candies, Inc.

Built in modules for expedited construction, each of this new supply boat series is equipped with 6 Detroit Diesel and 2 rebuilt EMD engines. The stern houses three DD gensets and two EMD drive units. Two more DDs power bow thrusters and a third DD is housed on the deck as a backup.





new line built with 32 S&S engines

8 ENGINES PER SHIP sounds like a lot, but in this case, they're just what the owner ordered. When Otto Candies, Inc. ordered 4 of a new class of supply vessels to serve the Gulf offshore industry, it had one goal in mind: build tough, versatile, efficient boats with power to spare. That's because these ships have to deliver tons of fuel, water, and drilling muds to deep water sectors and remain on station in almost any condition.

The new ships are being built by Bender Shipbuilding & Repair, Inc. in Mobile, AL, using a computer-integrated manufacturing process that creates modular sections for expedited construction. No less than **eight** Stewart & Stevenson engines per ship are installed for a total order of 32 engines. Twin rebuilt GM-EMD 16-645 E6 engines, capable of 1,950 hp at 900 rpm provide main propulsion. Maneuverability is provided by a pair of

Detroit Diesel 16V-149 engines, each developing 900 hp, to drive twin KaMeWa bowthrusters. Three DD 12V-71W gensets each create 250kw service power, and a 75kw DD 4-71N backup genset is on board for emergencies.

Otto Candies, Inc. took delivery of the **M/V Agnes Candies** in September. It was named for Mrs. Otto Candies, Sr., who christened it in a ceremony at the Bender Shipyard in Mobile. Mrs Candies is the matriarch of the Candies family which owns and operates a fleet of tugs, supply vessels, ocean barges, river pushboats and river barges worldwide.

Stewart & Stevenson engines were chosen to power these new vessels because our DD and EMD engines have given many years of reliable service in the Candies fleet. Let us show you how S&S can provide reliable power at a low cost for your vessel.



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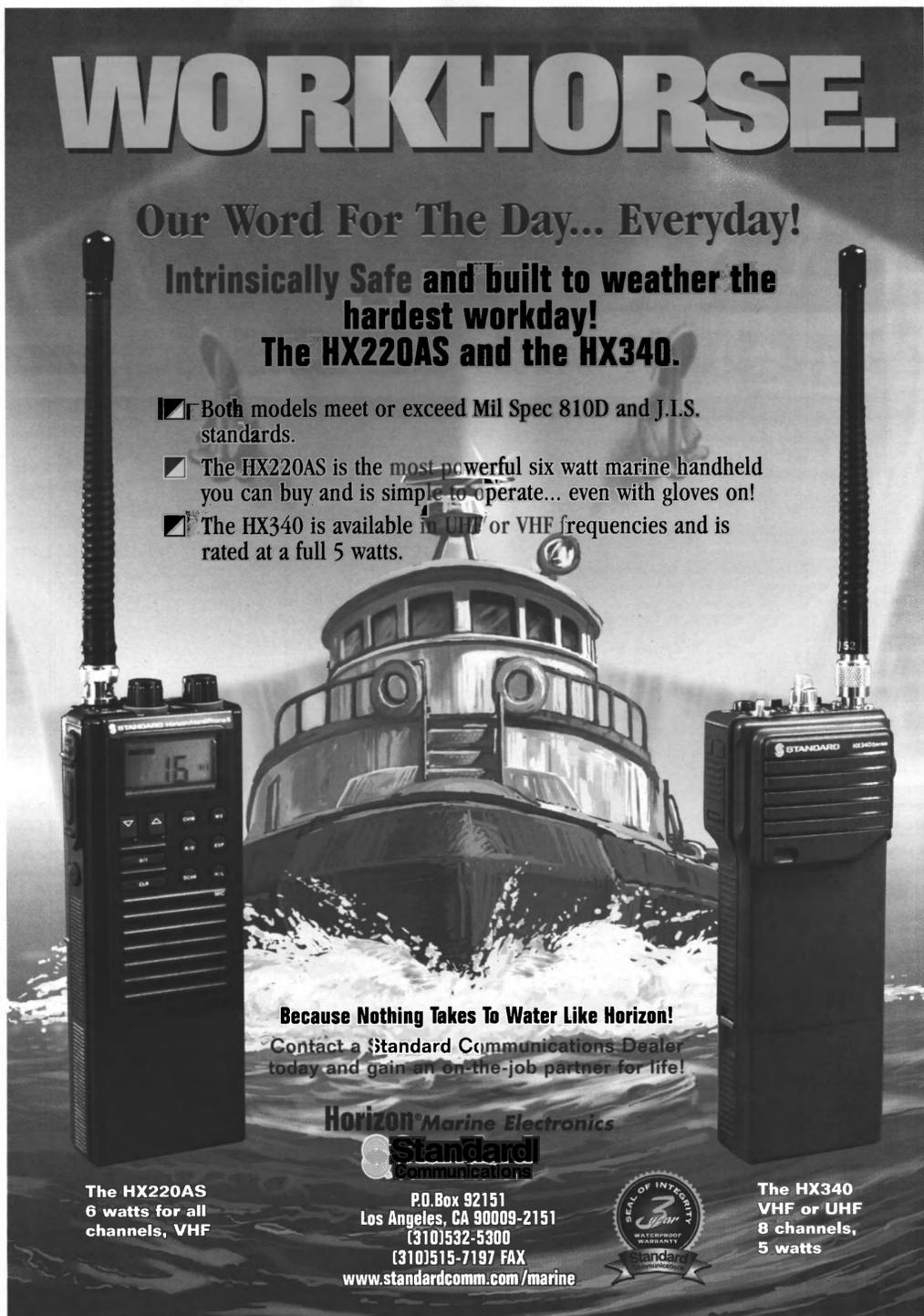
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GREAT BOATS OF 1998

SkipperLiner's Lady Pintail

In April 1998, SkipperLiner Industries launched a 149-passenger corporate entertainment yacht, M/V Lady Pintail. The vessel features cherrywood decor, along with marble floors and countertops. It has a four camera/two monitor external video system, 348,000 btu of HVAC, Eisenglass enclosed canopy with dedicated HVAC system, and a Datron satellite television system. SkipperLiner's in-house naval architect and marine engineers elevated the pilothouse to the third deck, allowing a 360 degree view. Moving the pilothouse allowed for the placement of an expansive dining salon and cocktail skylounge.

The second deck features a built-in U-shaped leather sofa, leather lounge chairs, and an electric fireplace. Lady Pinpoint is owned by Pintail Point, an exclusive hunting resort on the East Coast.

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Lady Pintail Main Particulars	
Length, o.a.	91 ft. (27.7 m)
Beam	20 ft. (6 m)
Fuel capacity	702 gal.
Waste capacity	440 gal.
Fresh water capacity	425 gal.
Displacement	98.5 tons
Passenger capacity	149
Hull material	Steel
Screw propulsion	Caterpillar 3208 DIT
Generator	70 kW Cummins
Screws (propulsion)	Michigan Wheel
Bow thruster	Westerbeke 42B
Marine gear	ZF
Engine mounts	Caterpillar
Propeller shaft coupler	Caterpillar
Steering system	Hydraulic
Shifting (propulsion)	Mathers MicroCommander
VHF/FM radios	Icom M56
Horn	Grover
Depth sounder	Impulse
Radar	Furuno 1721 (close array)
HVAC	348,000 BTU - Flagship Marine

HEAVY-DUTY SIGNALS by Kahlenberg



Model S-120 Piston Horn

Chosen for use on aircraft carriers as well as commercial vessels over 200 meters in length, the S-120 utilizes an oscillating piston driven by 7-1/2 horsepower 3 phase 220/440 volt electric motor producing 143 dB and a fundamental frequency of 94 Hz in 1/3 octave band at one meter.



Model S-203C/S-203 CHT

For vessels over 75 meters in length, this design allows both whistles to exceed 143 dB (1/3 octave band). The S-2036 and S-203 CHT are virtually maintenance free. Durability is ensured by the use of bronze and marine aluminum construction materials through out. For the most extreme cold weather operation, Model S-203 CHT (shown) includes a thermostatically controlled, heated enclosure for both the combination manual/electric valve, and the horn sounding body.

Kahlenberg Signals were developed to withstand the punishing use of commercial and military service. Their durability has been demonstrated over decades of service on ocean-going vessels ranging from naval warships to commercial vessels. Military specifications have required extensive testing for many of these whistles and the accessories supplied with them, which have proven the exceptional qualities of Kahlenberg design and manufacturing.

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MARINE PRODUCTS SINCE 1895

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Gulf Craft Inc.'s

John B. Martin McCall

John B. Martin McCall, reported to be the world's largest aluminum crew/supply vessel, was delivered to Seacor Marine. Measuring 185 x 35 ft., the vessel is working deepwater exploration projects for Chevron. The USCG-approved, ABS loadlined vessel is powered by six Cummins KTA 38-M2 diesel engines, rated at 1,350 bhp @ 1,950 rpm. Each engine is coupled to Reintjes WVS-430 marine gears, which turn Michigan Dynaquad Nibral propellers. The vessel is equipped with four rudders and a

(Continued on page 52)



January, 1999

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52

GREAT BOATS OF 1998



Derektor's Patricia Olivia II

Derektor Shipyards has launched a new high-speed 149.6 ft. catamaran passenger ferry for the Argentinean company Buquebus. Capable of operating speeds in excess of 52 knots, when fully loaded, this new vessel becomes the fastest passenger ferry of its class in the world.

Derektor engineers work with the ferry operator, helping evaluate which vessel design best suits its application, based on passenger capacity, speed, length of route, prevailing sea conditions and operating cost. Several arrangement and propulsion options allow maximum customization of the vessel for its intended use. Derektor ferries can be built to meet any classification society requirements and all applicable government regulations. Designed by Nigel Gee and Associates and styled by Pininfarina, this catamaran has an interior by Julio Cesar Ortega. This vessel is powered by twin Detroit Diesel AlliedSignal TF80 turbines coupled with Cincinnati MA107 gearboxes and MJP 950 waterjets. Choice of the TF100

power pack option would increase the operating speed to more than 61 knots.

Circle 76 on Reader Service Card

Main Particulars

Shipbuilder:	Derektor Shipyards
Flag:	Uruguay
Classification:	ABS Maltese Cross A1
Length, o.a.:	149.6 ft. (45.6 m)
Length, b.p.:	131.7 ft. (40.1 m)
Breadth, molded:	38.7 ft. (11.8 m)
Gross Tonnage:	480
Displacement:	202
Lightweight:	165
Deadweight (design):	37
Draft (design):	4.9 ft. (1.5 m)
Speed, Service:	53 knots
Complement:	10 crew
Cargo Capacity:	300 passengers
Bunker:	6,160 gal.
Main Engines:	(2) TF-80 Marine Gas Turbine
Total hp:	16,000
Propellers:	MJP 950 Waterjet
Generators:	(2) Alaska Diesel Electric M99C
Motor Starters:	Telemecanique Integral
Anti-Heeling System:	Maritime Dynamics
Couplings:	Novenco
Reduction Gears:	Cincinnati Gear
Steering Controls:	Bird-Johnson/PDI Waterjet
Coatings:	International
VHF Radio:	(2) Furuno FM 8500
SSB Radio:	Furuno FS-1562-15
Radar:	Furuno 8111, Furuno Black Box Radar
Compass:	C. Plath Navigat X Gyro
GPS:	Northstar 941XD
Autopilot:	C. Plath Navipilot V/GM
Collision Avoidance:	Furuno ARPA
Liferafts:	(4) Viking 2X50DK
Waste Management System:	Headhunter

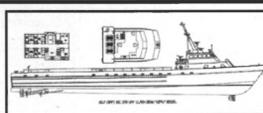
(Continued from page 51)

Thrustmaster 300 hp retractable bowthruster to ensure maximum maneuverability in large seas and strong currents often found at deepwater rigs. Electrical service power is provided by two Cummins 6BT5.9 diesel engines connected to Stamford 75kW generators. Additional equipment includes a 20 hp McElroy winch, a Fritz Culver transom quick release unit, a cascade oxygen breathing system for all crew and passengers, and fuel and rig water transfer systems.

Circle 77 on Reader Service Card

Main Particulars

Shipbuilder:	Gulf Craft, Inc., Patterson, La.
Owner/Operator:	SeaCor Marine, Houston



Flag:	U.S.
Classification:	USCG Subchapter "T", ABS Loadline
Length, o.a.:	185 ft. (56.4 m)
Length, b.p.:	173 ft. (52.7 m)
Breadth, Molded:	35 ft. (10.6 m)
Gross Tonnage:	475 ITC
Displacement:	600 lt
Lightweight:	215 lt
Deadweight (design):	385 lt
Draft (design):	9 ft. (2.7 m)
Speed, Service:	25 knots
Complement:	86 passengers, 6 crew
Water Ballast:	8,300 gal.
Main Engines:	(6) Cummins KTA 38-M2
Total hp:	8,100
Propellers:	Michigan Dynaquad Nibral
Thrusters:	Thrustmaster Model TH-300R-AL

(Continued on page 54)

Maritime Reporter/Engineering News

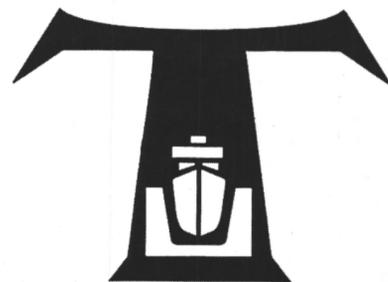


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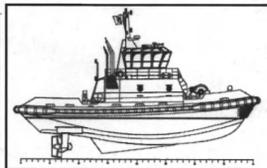
**Industries Ocean's
Ocean Intrepide**

Ocean Intrepide, built by Industries Ocean at Isle-aux-Coudres Shipyard, is the first in a new generation of Ship Assist Tug, delivered to Groupe Ocean Fleet, Montreal, Canada. The new vessel

features a double chine hull with gently sloping stem and a short skeg and counter stern. The hull is ice-strengthened for operation in eastern Canadian ports.

The vessel is powered by a pair of Mitsubishi S16R-MPTA engines, which provide a total of 4,076 hp to drive two Niigata ZP-21 360-

degree azimuthing Z-drive units, through Niigata RGC 140 KY reduction gear clutches (slip clutch) giving the tug a maximum speed of 12.8 knots. Auxiliary power is provided by two Mitsubishi 6D22T gensets with 165 kW each. The vessel features a new automation control system,



Bureau Veritas AUT-MS.
An electric line handling winch with single drum handling in both directions, variable speed, friction hand brake, spooling gear and warping head is located on the fore deck. The line pull is 18,000 lbs. at 70 fpm. The brake holding capacity is 240,000 lbs. On the aft deck is a vertical electric capstan mounted atop the towing bitt.

Main Particulars

Shipbuilder:	Industries Ocean
Owner/Operator:	McAllister/Groupe Ocean
Flag:	Canadian
Classification:	Bureau Veritas, 1 3/3
Length, o.a.:	80 ft. (24.4 m)
Breadth, molded:	30 ft. (9.1 m)
Gross Tonnage:	178
Lightweight:	302
Draft (design):	13.7 ft. (4.2 m)
Speed, Service:	12.8 knots
Main Engines:	(2) Mitsubishi S16R MPTA
Total hp:	4,076
Propellers:	Niigata ZP21 Z-peller
Generator Engines:	(2) Mitsubishi 6D22T
Generators:	165 kW Simpower SM 0165 D3P-6D22T
Couplings:	Centaflex
Reduction Gears:	Niigata
Engine Controls:	Simpson Power Product
Steering Controls:	IMPEG
Deck Machinery:	Timberland Line Handling Winch
VHF Radio:	2x Sailor RT 2048
Radar:	X-Band Radar
Compass:	Magnetic & Gyro Compass
GPS:	Trimble NT 200 D
Heat Exchangers:	Weka Box Coolers

(Continued from page 52)

Generator Engines:	Cummins 6BTS 9-6D (M)
Thruster Engines:	Cummins NTA 855-M
Generators:	Stamford 75kW
Couplings:	Reintjes
Reduction Gears:	Reintjes WVS 430
Engine Controls:	Kobelt
Steering Controls:	Gulf Craft Steering System
Deck Machinery:	Fritz Culver
Shafting:	Aquamet 17
Bearings:	Johnson Duramax
Coatings:	Hempel
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SSB Radio:	Sea 222
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By David Tinsley, technical editor

One of the few Turkish companies with a track record in chemical tanker construction, Celik Tekne Shipyard, has given new expression to its specialist skills with a project involving a 4,200-dwt vessel of IMO type II designation. The chemtanker newbuild, for Adrasan A S, is due to be delivered next month, giving added dimension to the capabilities of the industry in Turkey.

Since 1995, the yard's output has included two 3,500-dwt tankers arranged for IMO II chemical cargoes, and delivered into Dutch hands, followed in 1997 by a 1,500-dwt coastwise and river-going tanker designed to transport bitumen as well as chemicals. Through the latter contract, fulfilled for a north-west European operator, Celik Tekne acquired technical know-how in a field in which certain Dutch and Spanish yards have proved successful in recent years.

The current workload, though, demonstrates the extent to which

the Turkish builder has developed its standing in the intra-regional and feeder containership market, with boxship tonnage accounting for a high proportion of the 1999 delivery program. Scheduled to be commissioned in February, a 1,140-TEU newbuild to the account of Asil Gilda will rank among the largest vessels to date from the industry located on Tuzla Bay. Asil Gilda is part of the Pak Holdings group, which includes the Pinat shipping operation.

Production planning is geared to a requirement for deliveries in rapid succession during the late summer and fall of two 800-TEU containerships and an 8,200-dwt general cargo vessel. The pair of shortsea feederships is destined for Istanbul-based Furtrans Shipping & Trade, a constituent of the M Faruk Urkmez group, while the general purpose trader has been booked by another Istanbul company, Emsan.

Celik Tekne has invested substantially in the upgrading and capacity-enhancing development of its facilities, most recently mani-

fested in the provision of a slipway of 492 x 98.4 ft. (150 x 30 m) main dimensions, the largest at the yard. The latest expenditure has also entailed a new outfitting quay, with a 492 ft. (150 m) length compatible with that of the big slip, and two 50-ton gantry cranes.

Other features of the program have included the installation of the Tribon 4 system, from shipbuilding software specialist Kockums Computer Systems (KCS), a numerically-controlled (NC) oxy-fuel cutting machine, and the construction of a new, 1,000-sq.-m. office building. Some 15,000-sq.-m. of workshops and an NC plasma cutting machine figure large in the planned next phase of development.

Modernization and expansion have enabled the company to continue to demonstrate competitiveness in both the domestic and international domains, although investments are always founded on close consideration of the order-book and real newbuild project opportunities.

Celik Tekne is part of

Galatasaray Holding, which includes Karmaksan, a company dedicated to the production of LPG steel cylinders. Galatasaray's stake in the LPG market also derives from its ownership of two distribution and storage firms, Ocakgaz and Tekgaz.

Among the companies which have done much to raise Turkish shipbuilding's profile among the North European shipowning communities, Marmara Transport has maintained an export basis to its business in recent years through close consideration of design needs and product quality expectations.

A contract with a German client has seen the construction in 1998 of an 11,000-dwt feedership offering an 800-TEU container and self-sustaining cargo handling attributes. The project gives rise to the Marcon 800 design, in which an adjustable cell guide structure confers maximum hold flexibility to suit the requirements of specific trades and charterers. A competitive service speed in excess of 17 knots is promised from a Deutz 6,480-kW installation.

New Ship-Assist And Towing Tug For Turkey

In April 1998, Sanmar Denizcilik Makina ve Ticaret Ltd. of Istanbul, Turkey added Dogançay, a new twin-screw tug to its existing fleet.

The tug was designed by Robert Allen Ltd. of Vancouver, Canada, based on other successful twin-screw designs.

The vessel is designed to provide ship docking services as well as emergency deep sea towage in the Mediterranean and Black Seas, with the intention to provide a highly versatile tug for a range of different tasks. Emphasis was placed on very high maneuverability as well as good directional stability. Dogançay's steel construction and other manufacturing and installation work was performed by Sanmar's own shipbuilding crew, using facilities at Sahin Celik Shipyard of Istanbul.

On trials the vessel performed with a continuous bollard pull of 40 tons, and a maximum free running speed of 13.2 knots.

Dogançay Main Particulars	
Flag	Turkey
Classification	ABS
Length, o.a.	82.8 ft. (25.3 m)
Beam	28.2 ft. (8.6 m)
Depth	13 ft. (4 m)
Power	2 x 1,445 bhp
Complement	6
Speed, service	12 knots
Water ballast	53 cu. m.
Main engines	CAT 3512TA
Auxiliary engines	Beta Marine
Generator engines	Beta Marine
Generators	Newage, Stanford
Couplings	Vulkan
Reverse reduction gears	Reintjes
Engine controls	Kobelt
Propellers	Nautican design, LIPS BV
Rubber bearings	Johnson
Split roller bearings	Cooper
Steering controls	Data Hydraulic Ltd.
Deck machinery	Data Hydraulic Ltd.
Tow hook	Mampaey
Coating	Jotun
Fifi system	Minimax
Fifi pump	SMS
Air conditioning	Carrier
Liferafts	RFD
VHF	Sailor
Compass	Lith
Radar transponder	Lokata
GPS, Echo sounder, Radar	Koden
Searchlight	Norselight

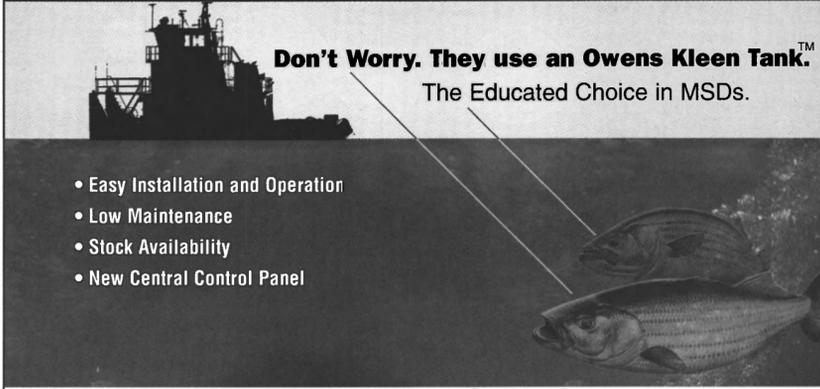
the modular principle by the yard itself, indicative of the company's latent shipbuilding possibilities.

Gemak's compact, but well laid-out site includes a 20-ton per day steelworking output capability for shiprepair and renewal purposes, and quayside for alongside repairs

to vessels up to about 160,000-dwt. Illustrative of its scope in the conversion sector, it undertook the steel-intensive readaptation of the 25,400-dwt bulker Nazli K into a self-discharging cement carrier. The yard also attracted a contract this year to modify a 55-m tug for

the towage of special fresh water containment units between Turkey and northern Cyprus.

As was also the case in Scandinavia in past years, for instance, a number of privately-owned Turkish organizations span shipbuilding as well as shipping



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Turkey: Modernizing & Expanding

and trading. Among such examples among the newbuild facilities clustered around Tuzla Bay is Yardimci Shipping's yard, which has contributed in a prolific manner to fleet development since 1994. As is typical of the Turkish independent shipbuilding sector's

gravitation towards vessels under 15,000-dwt, Yardimci's production is currently focused on container-modulated ships of around 7,800 to 8,800-dwt.

While the Turkish shipping industry steers the bulk of its fleet modernization and development

requirements to the domestic shipbuilding industry, the Dunya group's investment in two 46,500-dwt products carriers from Onomichi Dockyard provides a rare case of a private Turkish shipowner booking tonnage in Japan. Both newbuilds were deliv-

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The Chamber of Turkish Naval Architects and Marine Engineers was founded in 1954 and is one of the oldest engineering societies in Turkey. With head offices in Istanbul and branches throughout the country, the society has over 1,400 members consisting of naval architects, marine engineers, ship technology and ship construction engineers. The chamber is a member of The Union of Turkish Engineers and Architects (TMMOB), and founded the national classification society Turk Loydu in 1962.

Activities of the chamber consist of regulation of the relations of the society members; preparation of the related rules and regulations for the profession as well as technical specifications for the newbuilding, modification and repair jobs of ships, yachts and all type of floating vessels; national and international relations with regard to the safety and environmental protections aspects of the sea; relations with classification societies; and providing consultancy, expertise and arbitration services inside and outside of Turkey.

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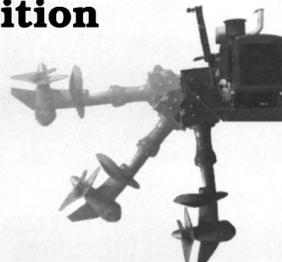


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ered in 1998, and technical supervision was handled through the Suay Umut-headed group's London company.

Judicious acquisitions on the secondhand market for tankers and bulkers had hitherto underpinned fleet development strategy. As a further example of Turkish recourse to overseas shipbuilders, the adoption of Australian high-speed vessel technology is having a major impact on the ferry network in Istanbul waters and the Sea of Marmara.

Istanbul Deniz Otobusleri (IDO) has increased its passenger-carrying capacity three-fold over the past four years through the addition of eight twin-hulled ferries designed and built in Western Australia by Austal Ships. The latest phase of investment was realized last month (December) through the entry into service of the 42-knot Turgut Ozal, the second of two 86-m vehicle-passenger catamarans of the Auto Express series.

Turgut Ozal, arranged for 800 passengers and 200 cars, or a mix

of up to 10 buses and 125 cars, has been assigned to the 62-nautical mile route linking Yenikapi, near Istanbul, with Bandirma, on which sistership Adnan Menderes has been engaged since July. (For more on Adnan Menderes, see *Great Boats* feature on page 40.)

IDO has successfully attracted an increasing volume of traffic off the Istanbul area's congested roads, and was on target at the time of writing to achieve an 11-million passenger throughput for 1998. Its enterprise has given a sharper edge to ferry competition in the region while helping to foster a degree of modal shift.

Like the Adnan Menderes, Turgut Ozal achieved its intended operational speed of 37-knots at less than 80-percent power with full load. This holds out the prospect of reduced operational costs for IDO and significant power and speed reserves in order to ensure that schedules can be maintained.

Turgut Ozal is the eighth Austal entrant to the fleet, the earlier deliveries having entailed two 30-m monohull ferries, two 40-m passenger catamarans, followed by two 60-m RoRo equipped passenger catamarans and the first of the Auto Express 86-type.

A progressive approach to transportation needs is also displayed by UND Ro-Ro Line, the shipping arm of the Turkish international haulers' association, Uluslarasi Nakliyeciler Dernegi (UND). Its maritime operations are based on the maintenance of links between Turkey and Trieste, on Italy's northernmost Adriatic shore, using capacious RoRo tonnage primarily for unaccompanied freight units, complemented by the provision of a shuttle flight service to and from Istanbul for commercial drivers.

UND has progressively expanded its fleet using Scandinavian-designed vessels, in particular, and is set to bolster its capacity further through the addition this year of two examples of the Stena 4-Runner class of 12,350-dwt freight ship. Following the handover of the first two newbuilds of the 4-Runner generation on long-term charter to the U.K.'s Royal Fleet Auxiliary, the third and fourth representatives of the series are due to be phased into service with UND during the spring and latter part of 1999.

Built by Societa Esercizio Cantieri (SEC) in Italy, the 22.5-knot class offers 2,715 lane-m for

January, 1999

freight on three decks.

UND had originally planned to receive the first and fourth of the 4-Runners, but problems in the production program in Italy resulted in a change in the order of commitments. As an interim measure, the Turkish operator engaged the first of Cenargo International's 23

knot-plus series of newbuilds on charter during the latter part of 1998.

Dimensioned for an all-freight load corresponding to 2,000 lane-m, and adopting a drive-through configuration, the 7,360-dwt Dawn Merchant gave first form to Cenargo's building program

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1999 Marine Propulsion Directory

This year's Marine Propulsion Directory starts with an "A to Z" listing of manufacturers of all different type of marine propulsion equipment, followed by a "Category" listing with company name only. Publisher is not responsible for errors or omissions.

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302-322-8080
302-322-8548
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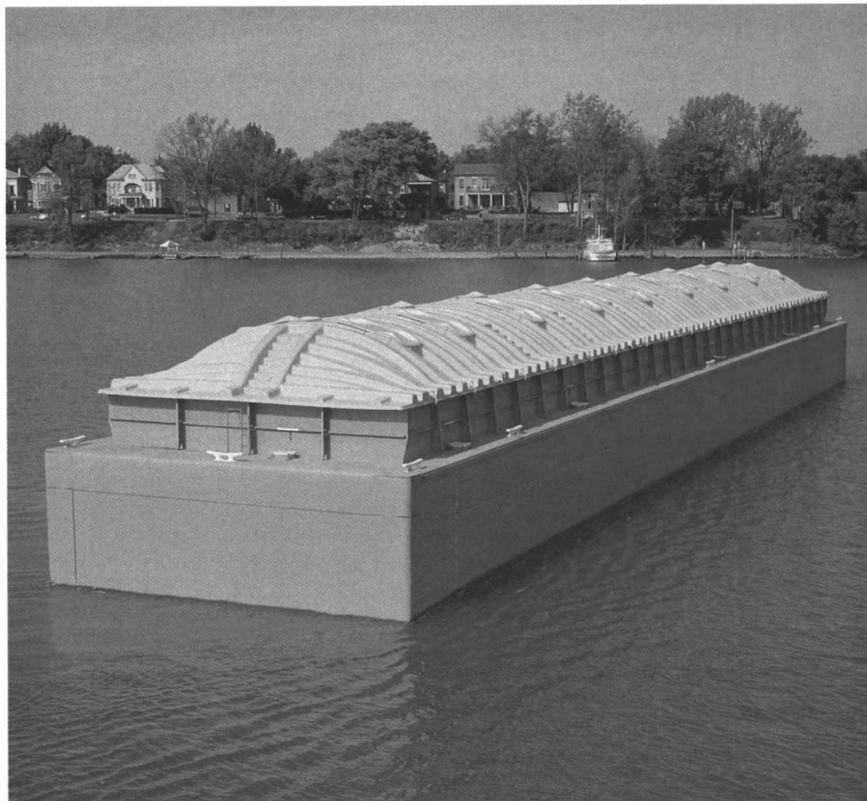
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Thorndon Bearings Inc
VescoPlastics - Johannesburg Sales

BEARINGS

American Industrial Plastics
BHS-Cincinnati Getriebetechnik GmbH
Cincinnati Gear Co
Gohens New York Corp

Valmet Power Transmission Inc

Valmet
Walter Machine Co Inc
Waltz & Krenzer Inc

COUPLINGS (FLEXIBLE)

American Vulkan Corp
BHS-Cincinnati Getriebetechnik GmbH
Centa Corp.
Coupling Corp Of America
Halley Marine Gears
S&S Flushing
S&S Pompano Beach
Vulkan

COUPLINGS (HOSE, CLUTCH, PIPE)

MAAG Gear Co Ltd
Pacer Pumps

CYLINDER LINERS

Gohens New York Corp
Sison S.S.
Stork Services B.V.

DIESEL ACCESSORIES

Automation Products Inc.
Boll Filter Corp

DIESEL ENGINE PARTS

Air Marine Systems
Alaska Diesel Electric
Alstom Diesel Inc.
Alstom Mirlees Blackstone
Brigantine Services Ltd.
Castaldi SpA
Comet Marine Supply
Cummins Engine Company
Cummins Mid-South, Inc.
Deutz Canada
DMI Workshop Company
Fluid Mechanics
Gohens New York Corp
Hermont Marine Inc
John Deere
Kawasaki Heavy Industries Ltd
Klattenberg Marine Agency
Louisiana Machinery Power Systems
MaK Motoren GmbH & Co.
MAN B&W Diesel AG
MAN B&W Diesel AS
MAN B&W Diesel AS-Alpha Diesel
MAN B&W Diesel Inc.
Marlborough Werk GmbH
Motor Services Hugo Stamp Inc
Motor Services AB
Niigata Engineering Co Ltd
Paxman Diesels
Performance Diesel
S.E.M.T. Pleschick
Sabre Engines Ltd.
Scardano Americas Brokerage
Sison S.S.
Stork Services B.V.
Ulslein Bergen AS
Victaulic Co of America
Wartsila NSD North America Inc

DIESEL ENGINE ANALYZER

FCS Inc. (Malin COM)
Hermont Marine Inc
ICON Research

DIESEL ENGINE PARTS

Air Marine Systems
Alaska Diesel Electric
Alstom Diesel Inc.
Alstom Mirlees Blackstone
Brigantine Services Ltd.
Castaldi SpA
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Performance Diesel
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Scardano Americas Brokerage
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Stork Services B.V.
Ulslein Bergen AS
Victaulic Co of America
Wartsila NSD North America Inc

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DIESEL ENGINE PARTS

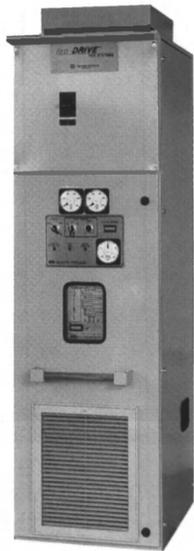
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Alaska Diesel Electric
Alstom Mirreles Blackstone
Cummins Wartala
Deutz Canada
Gohens New York Corp
MaK Motoren GmbH & Co.
MAN B&W Diesel AS + ally
S.E.M.T. Pielstick
Sabre Engines Ltd.

DRIVERS (GEARS)

BHS Cincinnati Getriebetechnik GmbH
Cincinnati Gear Co
Schelde Gears BV

ELECTRIC PROPULSION

ABB Industry Oy
Cincinnati Gear Co
Kawewa Group
Kawasaki Heavy Industries Ltd
MaK Motoren GmbH & Co.
S.E.M.T. Pielstick
SCHOTTEL-Werft
Siemens AG
Siemens Electric
STN Atlas Marine Electronics GmbH

ELECTRICAL MOTOR DRIVES

Marine Safe Electronics (MSE of Canada)
STN Atlas Marine Electronics GmbH
Tech Power Houston

ENGINE

Kabel Manufacturing Co Ltd
MaK Motoren GmbH & Co.
Mathers Controls Inc
Sabre Engines Ltd.
SCHOTTEL-Werft
STN Atlas Marine Electronics GmbH

ENGINE ROOM AUTOMATION

Electronic Design
Seneca Marine Inc
STN Atlas Marine Electronics GmbH

ENGINES (DIESEL)

Alaska Diesel Electric
Alstom Mirreles Blackstone
Alstom Ruston Diesels
Caterpillar
Centa Antriebe Kirschey GmbH
CMB Cummins
Cummins Engine Company
Cummins Wartala
Daihatsu Diesel Manufacturing Co Ltd
Daytona Marine Engine
Detroit Diesel
Deutz Canada
Deutz MWM AG
Dieselmotorenwerk Vulkan GmbH
Electro-Motive Div. of General Motors Corp.
Fairbanks Morse (Coltec Industries)
Florida Performance Diesel
GE Industrial & Marine Engines
Gohens New York Corp
Inland Detroit Diesel Allison
John Deere
Kawasaki Heavy Industries Ltd
KHD Canada
Kliffenburg Marine Agency
Krupp MaK Diesel
Louisiana Machinery Power Systems
MaK Motoren GmbH & Co.
MAN B&W Diesel AG Service Center Werk
Hamburg
MAN B&W Diesel AS
MAN B&W Diesel AS-Alpha Diesel
MAN B&W Diesel Inc.
Mitsubishi Heavy Industries Ltd
MTU Friedrichshafen
Niigata Engineering Co Ltd
Paxman Diesels
Perkins
Prutechakog
S.E.M.T. Pielstick
Sabre Engines Ltd.
Scania
Stewart & Stevenson Services Inc
Ulstein Bergen AS
Valva Pumps of the Americas
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ENGINES (GASOLINE)

CMB Cummins
GE Industrial & Marine Engines
Louisiana Machinery Power Systems
Niigata Engineering Co Ltd

GAS TURBINES

GE Industrial & Marine Engines

GENERATING SETS (DIESEL, GAS, ELECTRIC)

Alstom Mirreles Blackstone
Alstom Ruston Diesels
Caterpillar
Cummins Engine Co.
Cummins Wartala
Daytona Marine Engine
Detroit Diesel
Deutz Canada
Inland Detroit Diesel Allison
KHD Canada
Louisiana Machinery Power Systems
MaK Motoren GmbH
MAN B&W Diesel AS
Mitsubishi Heavy Industries Ltd
MTU Friedrichshafen
Paxman Diesels
S.E.M.T. Pielstick
Sabre Engines Ltd.
STN Atlas Marine Electronics GmbH

GENERATOR PANELS

Sabre Engines Ltd.
Seneca Marine Inc.

GENERATORS

Baylor Company
Caterpillar
FIS Inc. (Malin COM)
Louisiana Machinery Power Systems
Marine Safe Electronics (MSE of Canada)
Sabre Engines Ltd.
STN Atlas Marine Electronics GmbH

JET

Holland Roer Gretha
SCHOTTEL-Werft
Thrustmaster of Texas

MARINE GEARS

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ATA Gears
BHS Cincinnati Getriebetechnik
Caterpillar
Cincinnati Gear Co
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Hermont Marine Inc
Karl Senner
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Marine Gears Inc
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Niigata Engineering
Philadelphia Gear
Reinjes GmbH
Renk Tacke GmbH
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Twin Disc Inc
Ulstein Bergen AS
Valmet Power Transmission Inc
Walter Machine Co Inc
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MARINE SHAFTING

Centa Corp.
Kahlenberg Bros Co
Marine Safe Electronics (MSE of Canada)
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MOTOR PROTECTION EQUIPMENT

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Mecklenburger Metallguss GmbH
S&S Flushing
S&S Pompano Beach
Sound Propeller

PROPELLERS

Associated Marine Technologies
Bird-Johnson Co
Black Dog Stevensville
Cummins Wartsila
Holland Roer Gretna
Kahlenberg Bros Co
Kamewa Group
Kawasaki Heavy Industries Ltd
Lips BV
MAN B&W Diesel AS-Alpha Diesel
Mecklenburger Metallguss GmbH
Michigan Wheel Corp
Nakashima Propeller Co.
Rice Mazzolan
Ralla Sp Propellers
Ralla Sp Propellers USA
S&S Flushing
S&S Pompano Beach
Schottel Inc
SCHOTTEL-Werft
Sound Propeller
Ukrain Bergen AS
Valve Penton America Inc
Valvo Penton of the Americas

PROPELLERS (CONTROLLABLE PITCH, RECONDITIONING)

Bird-Johnson Co
Cummins Wartsila
Haley Greenville
Holland Roer Gretna
Kamewa Group
Karl Senner
Kawasaki Heavy Industries Ltd
Lips BV
MAN B&W Diesel AS-Alpha Diesel
S&S Flushing

S&S Pompano Beach
Schottel Inc
SCHOTTEL-Werft
Sound Propeller

PROPULSION GEARS

Caterpillar
Cincinnati Gear Co
Haley Greenville
Karl Senner
MAAG Gear Co Ltd
MAK Motoren GmbH & Co.
Schelde Gears BV
SCHOTTEL-Werft
Valmet Power Transmission Inc

PROPULSION MONITORING

Bird-Johnson Co
Caterpillar
FCS Inc. (Molin CDM)
ICON Research
John J. McMillen Associates
Keller
Protech/Inkong
Schottel Inc
Vulcan

RUDDER

Goltsens New York Corp
IHC Logersmit
S&S Flushing
S&S Pompano Beach
Thordon Bearings Inc
VescoPlastics - Johannesburg Sales

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S&S Flushing
S&S Pompano Beach
Thordon Bearings Inc

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Blahm & Voss Industrie GmbH
Goltsens New York Corp
IHC Logersmit
S&S Flushing
S&S Pompano Beach
Sound Propeller
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Raikko Ltd.
SCHOTTEL-Werft
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Karl Senner
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Lips BV
Niigata Engineering Co Ltd
Schottel Inc
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Walter Machine Co Inc

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Support Grows For Wärtsilä 64

Developed in response to demand for large medium-speed engines, the Wärtsilä 64 is designed for high output, compact size, fuel economy, good dynamic properties, low emissions, reliability and easy maintenance.

The engine is targeted to solve a great many power problems, and was designed for large and fast cargo ships, which can benefit from the advantages of a single medium-speed main engine, CP propeller and shaft generator; large tankers, which can be pow-

ered with a redundant twin-engine plant, providing efficient shipboard electricity; and large containerships, which are limited by the power that can be transmitted though a single propeller, and the physical size of two-stroke units.

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(Propulsion Notes are continued on page 77)

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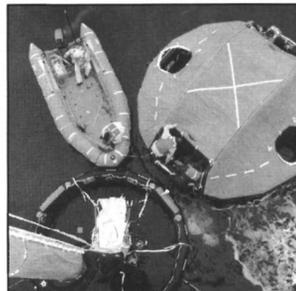
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69

IBIA Elects New Executive Committee

The International Bunker Industry Association has elected a new executive council which will serve until October 1999. **Ivar Tonnesen**, bunker manager of Gearbulk, has been elected IBIA's chairman for the 1998/1999 council year.

First Step Towards Phase One Of Port 2000

The first step in the \$870 million expansion of container facilities at the Port of Le Havre was taken as the French Minister of Transportation, **Jean-Claude Gaysot**, signed an enabling document for phase one of the Port 2000 project.

Final technical and economic studies will begin on four new berths in the first stage of the new facility which will have a long uninterrupted quayside outside of the present tidal basin of the Port of Le Havre, just south of the present container facilities. Phase one, at a cost of \$563,000, will include planning for direct rail and road service to the new berths.

NCA Appoints General Manager

NCA Nuovi Cantieri Apuania SpA of Marina di Carrara, Italy, has appointed **Alessandro Guadagni** as its new general manager. Most recently Mr. Guadagni worked with SEC Shipyards Group of Viareggio.

The appointment is part of a new expansion policy being undertaken at the shipyard. Two of the yard's most recent accomplishments include the delivery of Excellent, a deluxe cruise-ferry, to its owner Grimaldi of Genoa, and the launching of M/S Isola Gialla, a chemical carrier with a 45,000 cu.-m. capacity under completion for the Festival Group of Rome.

ACL Appoints Six

American Commercial Lines LLC has announced the following appointments: **James J. Wolff** as senior VP-Finance & Admin., and CFO; **Martin K. Pepper** as senior VP- International Business Development; **Chris Brinkop** as VP-Gulf Operations; **Bill Kinzler** as VP-River Operations; **Michael A. Khouri** as senior VP-Corporate Services; and **Mary C. Strench** as VP-General Counsel & Secretary.

ACBL Promotes Two In IT Department

Jim Remaley has been appointed manager of Systems Development at American Commercial Barge Lines, Inc. (ACBL). Mr. Remaley was previously manager of End User Computing and Support Service. **Julie Elliott**, with the company since 1979, has been promoted from E-mail Administrator to manager of End User Computing.

Autronica Signs Cooperation Agreement

Autronica AS Maritime Instrumentation of Norway and Hyundai Information Technology have recently signed a cooperation agreement regarding marketing and sales of Autronica's Radar-based Level Gauging System. Autronica evaluates the annual South Korean market for these systems to be more than \$15 million. Hyundai Information Technology expects that the cooperation agreement will have a substantial effect on the turnover of the Autronica systems in South Korea.



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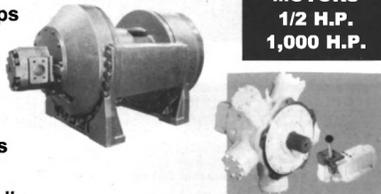
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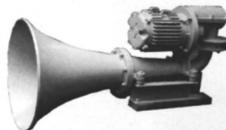

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SHIP REPAIR & CONVERSION

Significant Repair Jobs Fill Yards At Year's End



Pegasus Bay is the first ever P&O Nedlloyd containership to drydock at A&P Southampton.

At Year's End

A&P Falmouth has won a \$9 million contract to carry out extensive repair, maintenance and upgrade work onboard the Ministry of Defense Landing Ship Logistics vessel Sir Percivale. Work includes substantial steelwork repairs, engine inspection and overhaul, maintenance of accommodation areas, a full blasting and painting program and upgrade of ship's safety systems in line with SOLAS guidelines.

The 5,550 tons displacement vessel is 413 ft. (126 m) long and has a beam of 59 ft. (18 m). Built in 1968 by Hawthorne Lesley, Sir Percivale was due at the yard on December 7, and is scheduled to be delivered back to the MOD on April 30, 1999.

Meanwhile, the Landing Ship Logistics (LSL) vessel Sir Galahad, which was built by Swan Hunter on the Tyne in 1987, is to return to the river for a Survey and Essential Defects (SED) refit at the Wallsend yard of A&P Tyne in December. The contract, which comes on the heels of a contract for the conversion of the Smit Pioneer, won by A&P, will see A&P Tyne entering the last year of the millennium with a strong order book.

Work on the 8,861-grt, 460-ft. (140.5-m) long, 65.6-ft. (20-m) beam vessel will include survey and maintenance work on virtually all ship's system including hull and below the water line systems, steering gear, propulsion engines and auxiliaries, fire safety systems, fuel pumps, accommodation areas, pipe and electrical systems and flight deck equipment.

Sir Galahad was due at A&P Tyne on December 7, and is to be delivered back to the MOD on January 8, 1999.

On the commercial side of the group's activities, A&P Southampton has been awarded the contract

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to refit Fred Olsen Cruise Lines' 28,492 grt cruiseship Black Watch at its King George V graving dock. The contract, which is part of an investment by Fred Olsen of more than \$1.7 million in upgrading and maintaining the ship, saw the vessel arrive at the yard on December 3 for a 12-day refit.

Denmark's Orskov Christensens Staalskibsvaerft has over the past few months secured two major conversion contracts from the international market. The first to be awarded was the 3,548-dwt Bahamas offshore supply vessel Kommandor 3000, being converted from a RoRo vessel earlier this year. DSND has recently concluded a provisional agreement with Brazilian state-owned oil group, Petrobras, to enter into a supply contract, worth \$77 million, to supply another vessel for laying flexible pipelines in Brazil waters. The agreement has a term of two years plus a one-year option, with delivery during the second quarter of 1999. The latest conversion project will commence at the beginning of next year at a yet unnamed shipyard in Europe.

The second contract involves District Offshore's 2,500-dwt standby safety vessel Skandi Captain being converted into a subsea inspection and maintenance ship. Arriving at the yard during late-December, the vessel is expected to be completed by next March 1999, and will be renamed Skandi Inspector. The scope of the work includes: installation of han-

dling equipment (for remotely-operate vehicles (ROVs); installation of new accommodation module (aft); installation of accommodation deck (below the existing bridge deck); modification of existing accommodation; installation of ROV handling hangar; installation

The multi-purpose crane vessel Saipem 7000 approaching Rotterdam's Verolme Botlek yard.



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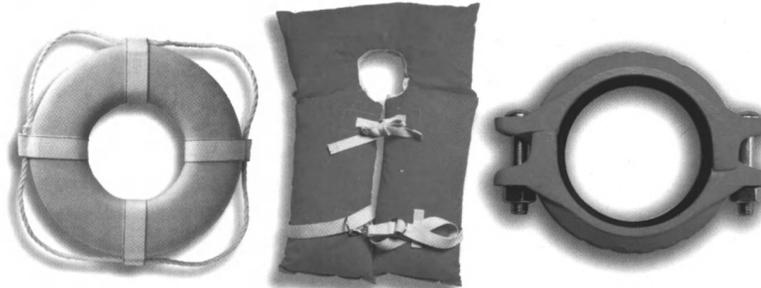
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RefMan Makes Writing Repair Specs Easier

RefMan for Windows is a computer-based Refit/Repair Management System that was developed to allow technical personnel involved in the day-to-day running of ships to take control of the ship repair process. The system, one in a long line of software solution type products designed to provide shipowners with the most advanced tools to manage cost and quality, consists of three software modules: Specification Generator for compiling and printing specification documents; Cost Control for recording, analyzing and reporting on the cost of jobs; and Shipboard Defect Recording for recording defects and other ship initiated jobs onboard.

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January, 1999



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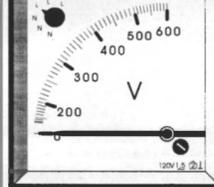
of two moonpools; installation of third thruster (650 kW output); fitting of two new auxiliary generators (1,170 kW output each); and installation of helideck (capable of accommodating Super Puma AS332L2 helicopters).

During early October 1998, Dubai Drydocks was awarded the contract for the extensive refit of the floating production vessel Cossack Pioneer by owners Woodside Energy Ltd. The vessel, which is currently moored about 130 km northwest of Dampier, Western Australia, will be taken off station this month and is scheduled to dock at the yard in February. The work includes major improvements to the gas export system, improvements to the existing four gas turbines and two stern turbines, the installation of an additional gas turbine and generator, improvement to emergency generators and the uninterrupted power supply, and upgrades of electrical switch gear and fire pumps. Extensive pipe renewals are planned throughout the ship during the upgrading of the process plant. The product

swivel assembly will be dismantled for rematching and seal replacement. The accommodation module will be enhanced, and the control system will be upgraded and consolidated, to include rectification of potential Year 2000 problems. During its visit to Dubai, the vessel will be taken through its sixth special survey, under ABS regulations. Apart from winning this contract, Dubai Drydocks' figures for ships being handled during its financial year - to the end of October - is running at the same levels as 1997, with ULCCs and VLCCs totaling 38, compared with 35 at the same period last year. Ships of this type recently at the yard include: NT Argonaut's 285,640-dwt VLCC Argo Athena; Frontline's 491,120-dwt ULCC Sea World (reported to be the world's largest vessel); Olympic Shipping's 302,789-dwt ULCC Olympic Legacy; Livanos' 357,053-dwt ULCC Stavros GL; World-Wide Shipping's 276,422-dwt VLCC Pisa; and Ceres Hellenic's 412,098-dwt ULCC Kapetan Hatzis.

Despite the increasing competition within the shiprepair industry, particularly from the yards in South East Asia, Bahrain's Arab Shipbuilding & Repair Yard (ASRY) has experienced satisfactory demand during the third quarter of 1998, recording sales for the first nine months of the year slightly above budgeted levels at \$61.5 million. Once again, demand during the summer period increased, with the total productive man-hours in the third quarter up 16 percent

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Maritime Reporter/Engineering News

against the preceding quarter and 25 percent higher than the same 1997 period. A total of 24 vessels were repaired by the yard in the third quarter 1998, part of a total of 82 vessels throughout the nine-month period, slightly below levels handled in 1997 — 28 and 86 vessels respectively. Steel renewals rose by 33 percent to 4,329 tons during the nine months to September and pipework increased significantly by 80 percent to 48.6 km, compared with the same period last year, with the third quarter accounting for a large proportion of the increases.

Hull treatment, mechanical and boiler work were all at similar levels to the first nine months in 1997, although electrical work was reduced. Strong demand was noted for ASRY's internal tank blasting/coating services and main-deck hydroblasting.

Predominantly known as a major player in the large tanker repair sector, ASRY docked its longest vessel in 21 years of operation during the third quarter, when the 409,400 dwt Liberian-registered ULCC Sea Splendour, owned by Seatankers, drydocked. She was at the yard undergoing her fourth special survey and life extension work.

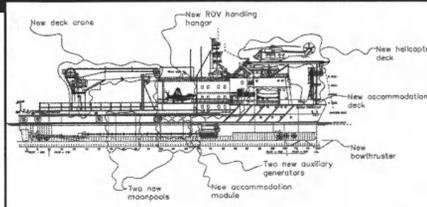
Another notable contract carried out at ASRY was the extensive modification of a ULCC's cargo piping and control systems to facilitate 'over the top' loading, which required 23 km of hydraulic lines and 68 valves to be supplied and fitted. With regards to newbuilding projects, steel construction for the company's new mooring boat, which is ASRY's first newbuilding contract, is already underway and is scheduled to be completed by April 1999. With this project, the yard is currently looking to expand its portfolio in the small vessel sector, including harbor tugs and other service craft, for local clients in the area.

Apart from the construction of a new shipyard in Vietnam, named Hyundai-Vinashin Shipyard, which is due to be opened in February 1999, South Korea's Hyundai Mipo Dockyard (HMD) has announced the signing of a conversion contract with Gearbulk Shipowning Ltd. The contract calls for the conversion of the 42,676-dwt Bahamas general cargo vessel Hawk Arrow into a liquefied pitch carrier, able to carry around 7,550 cu. m. of

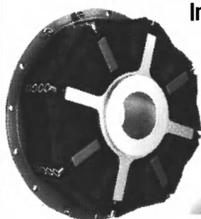
molten pitch. Scheduled to arrive at the yard during the first quarter, work will include the installation of two cargo tanks in the vessel's No. 4 hold.

The tanks will be installed with other arrangements for pumping, heating, inerting, ventilation and

The Skandi Captain conversion contract won by Orskov Christensens Staalskibsvaerft entails the installation of a new bow thruster, auxiliary generators, a new deck crane and a new accommodation module, among other items.



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SHIP REPAIR & CONVERSION

fire protection. To save time and simplify the installation process, the tanks will be prefabricated to the maximum extent with all internal fittings, external stiffening and insulation prior to the vessel's arrival at the yard. The contract is expected to take two months from when the ship arrives at the yard in Ulsan.

Rotterdam's Verolme Botlek has been awarded a modification project by offshore company Saipem Luxembourg SA onboard the world's largest semi-submersible crane ship Saipem 7000. The project, which is to extend the vessel's multi-purpose duties of heavy-lift and pipe laying capabilities, is understood to be the largest contract won by the yard in the past five years in the conventional shiprepair market (non-rigs).

Scope of work includes: detailed engineering; prefabrication and installation of five hinges for J-lay tower and A-frame; conversion of the carpentry workshop into two boiler rooms; outfitting of two existing spaces as new diesel generator rooms; installation of four 16V32 Wartsila diesel engines; conversion of two ballast tanks

into thruster rooms; renewal of the DP system (10 to 12 units); extension of the high voltage supply system; construction and outfitting of a separate high voltage room in foreship area; installation of new additional piping systems; construction of new transformer; and engineering, supply and installation of electrical systems for modified systems, J-lay tower and DP systems.

The 117,812-grt crane ship, built in 1987 at Fincantieri's Monfalcone-based shipyard, arrived in Rotterdam in November 1998 and is scheduled to depart the yard by the end of March 1999. Effective from the beginning of December 1998, Labroy Marine's shipbuilding, shiprepairing and engineering businesses shares and assets were transferred to Labroy Shipbuilding & Engineering (LSE), which was previously managed under Singapore's Heng Huat Shipbuilding and Construction Ltd. and Indonesia's PT Nanindah Mutiara Shipyard (Batam). Meanwhile, a new 25,000-dwt capacity floating dock will shortly be launched at LSE's PT Nanindah Mutiara Shipyard — the dock

expected to be fully operational by mid-January. This unit will complement the yard's existing 8,000-dwt capacity floating docks, extensive water frontage, covered workshops and newbuilding berths.

Integrated Condition Monitoring/Process Data System Launched

Hailed as the first integrated plant-wide condition monitoring and process data system, the SKF MARLIN (Machine Reliability Inspection System) promises to usher in a new era of condition monitoring. Both maintenance and process function monitoring are combined in a lightweight, compact portable package which reportedly combines the advantages of an on-line system with a handheld tool.

MARLIN is designed to support total Productive Maintenance objectives, providing an opportunity to bring operations, maintenance, vibration analysis and reliability functions closer together. The unit consists of: a data manager, which is a hand-held computerized Personal Data Assistant; a

condition director which measures velocity, acceleration enveloping and temperature; QuickConnect mechanical and/or programmable studs for fast, efficient and reliable connections between machine and sensor; and SKF's new PRISM4 Surveyor Software for programming the Data Manager, designed to provide long-term storage of collected data for review, reporting and in-depth analysis.

Circle 33 on Reader Service Card

Helifusion Saves The Day For Cruise Ship

When the salt water pump of a major cruise liner was failing to operate, resulting in the loss of the vessel's ability to produce fresh water from one of the ship's evaporators, Helifusion Engineering Ltd. helped to solve the problem. On examination, the company found that the suction ring had completely eroded away, resulting in the bypassing of water from the discharge side of the pump to the suction side. The company rebuilt the eroded area, and machined it to accommodate a newly manufactured suction ring.

Circle 31 on Reader Service Card

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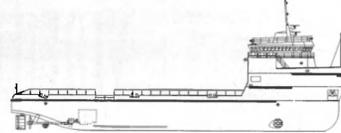
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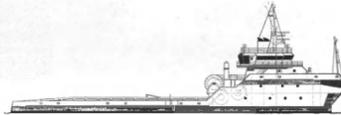
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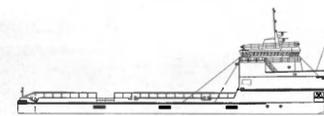
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Supply Vessel



220'x48'x20' 8000 HP
Anchor Handling Tug Supply Vessel



220'x54'x20' 4000 HP
Z-Drive Supply Vessel

(Propulsion Notes, continued from page 69)

Schottel Is Now Anchored In Houston, Texas

As innovators in steerable propulsion, Schottel Inc. is now manufacturing at its new facility based in Houston. Offering replacement parts and new products for Schottel steering and propulsion systems, Schottel Inc. has already produced thruster systems for Enesco and Reading & Bates at its new facility in Houston.

The new office includes Sales, Engineering and Service and is currently managed by Mr. Joachim Schien, General Manager and Mr. John Ryan, Sales Manager.

Circle 63 on Reader Service Card

Haley Participates In Tug Repower

Haley Marine Gears of Belle Chasse, La. is supplying a gear unit for the re-power of a River Parish tug. Haley is supplying the re-manufactured marine reduction gear unit, model RM-2035, 3.05:1 vertical offset for Commander, which is rated 3,600 hp at 1,050. Haley Marine Gear is a 26-year-old, family-owned company which designs and manufactures marine

propulsion gears in the 1,000 to 6,000 hp range, as well as high quality torsionally resilient couplings in the 1,000 to 6,000 hp range.

Circle 50 on Reader Service Card

MAN B&W Logs New Contracts For L27/38

Debut orders last October totaling 32 gensets have been recorded by MAN B&W's L27/38 engine, the second of a new generation of small four-stroke medium speed designs from the manufacturer. One contract is for the auxiliary power demands of four 4,300 TEU containerships; another for the installation aboard four 2,200 TEU containerships.

Circle 60 on Reader Service Card

New Fuel Oil Pump Minimizes Problems

IMO has introduced a new generation of its ACE pump which features Seal Guard, designed to be a solution to some traditional fuel oil pump problems. Specifically, a secondary seal has been fitted on the atmospheric side of the shaft seal, thus completely isolating the inner seal from contact with the air. The

secondary seal is filled with a barrier liquid, which is kept under constant pressure, thus minimizing the leakage of fuel oil.

Circle 55 on Reader Service Card

Deutz Program Addresses Efficient Maintenance

Taking cues from the car and truck business, Deutz AG has introduced a parts exchange and replacement program which is designed to reduce lay time for marine engine users. A key feature is the replacement of complete assemblies in the case of damage.

A recent example is the replacement of a complete bedplate with bearings and crankshaft on one of seven Deutz engines installed in a pipe layer operation off the Brazilian coast. The special purpose vessel features seven in-line 528 series engines.

Within the Deutz service organization, the Service Center West in Duisburg specializes in the manufacture of Recon parts, complete Recon engines and complete Recon assemblies.

Deutz is one of the oldest engine manufacturers in existence, and the company has a solid reputation for developing high performance

engines. It will seek to extend its repertoire, adding engines in the range from 100 to 500 hp.

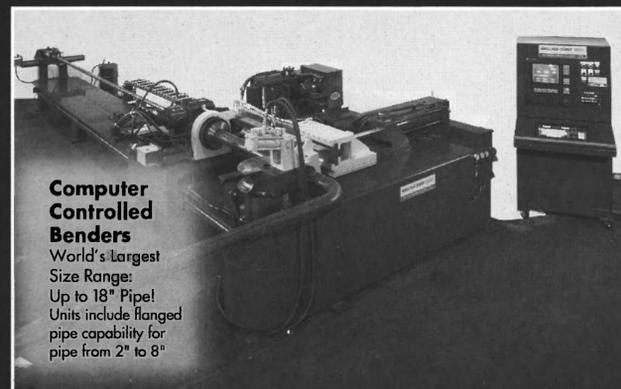
Deutz Canada Inc. — a wholly owned subsidiary of Deutz Germany — markets, sells and provides service for industrial high speed engines in Canada, as well as for medium speed marine and genset engines for North and Central America, as well as the Caribbean. Deutz Canada offers marine propulsion engines from 500 to 10,000 hp, and marine gensets from 100 to 6,000 kW.

Circle 59 on Reader Service Card

PacifiCat Reaches Loaded Service Speed

BC Ferries' first aluminum-hulled fast ferry has successfully completed loaded speed trials. As part of the trials process, the PacifiCat's lower vehicle deck was loaded with flexible water-filled bladders to simulate loaded conditions. The loaded vessel went through an extensive series of tests including speed, maneuverability and hull stress analysis. The PacifiCat reportedly met every major performance criteria including comfortably achieving its 37-knot service speed.

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Shell Offers New Marine Communications Package

Shell Marine Products, Shell's global supplier of marine fuels, lubricants and services, has launched a new low cost communications and service package for the marine industry, called SMP

World. The system has been designed to help ship operators reduce the cost of communications from their ships, but can also be installed and used in shore offices. Communications are made through the Internet or by linking to a Shell computer server. Data files transmitted can include docu-

ments, spreadsheets or files from other third party systems. SMP World is also fully compatible with Shell's RLA OPICA used oil analysis software. Depending upon the specific circumstances, Shell Marine estimated that cost savings in excess of 20 percent are possible when SMP World is compared to certain other ship board communication systems.

Circle 46 on Reader Service Card

sive training solution for cargo operators on LPG vessels.

Circle 64 on Reader Service Card

LR To Issue Marine Equipment Directive

Lloyd's Register (LR) and Lloyd's Register Quality Assurance Ltd. (LRQA) have been appointed by the U.K.'s Maritime and Coastguard Agency (MCA) to certify equipment under the EC's Marine Equipment Directive.

Stratos Partners With Litton

Stratos and Litton Marine Systems have signed a contract making Litton an official distributor of Stratos' multi-network mobile satellite products and services. Litton Marine will now offer its customers around the world Stratos' new handheld global Iridium satellite voice and paging products and services, in addition to global Inmarsat, MarineSat and LandSat products and services.

Circle 45 on Reader Service Card

GL Ranked Fourth Largest

Germanischer Lloyd (GL) announced that its core ship classification activities grew by 19 percent in 1997. Worldwide, 4,664 seagoing ships of 26.6 million GT were in GL class at the end of 1997, representing a 12 percent increase in tonnage over the previous year. A member of GL's executive board, **Rainer Schoendube**, said, "Reckoned by the number of ships classed of over 300 GT, GL is now the fourth largest classification society." Mr. Schoendube also said that GL held nearly 50% of worldwide container-ship orders by number at the end of 1997.



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Circle 319 on Reader Service Card

Aker Wins \$60.6M Order

Aker Maritime ASA won a contract from Esso Norway worth \$20.2 million annually over three years. The contract is for the maintenance of installations in the Jotun and Balder fields in the Norwegian sector of the North Sea.

Transas Now Offers Liquid Cargo Handling Simulators

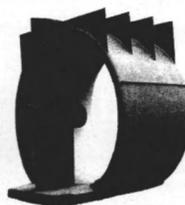
Transas has completed development of two types of Liquid Cargo Handling Simulator:

"Oil Tanker" is specifically designed for the training of personnel responsible for cargo operations on Crude Carriers and Product Carriers; and

"Liquified Petroleum Gas (LPG) Carrier" is for the the comprehen-



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St. Gregory Aluminum Catamaran

FEATURES	SPECIFICATIONS
Built in 1996	Length: 78', Width: 26.5', Draft: 2.5'
Low main engine hrs., approx. 2,500	Tonnage: 91 gross tons
Low gen-set hrs., approx. 4,500	Cruise Speed: 25-26 knots with 150 passengers
Superior maneuverability	Maximum Speed: 28-31 knots light
Finished interior, full galley	Main Engines: (4) 550 hp Luggar 6140AL
Speed 27-30 knots	Generator: (1) 30kw Northern Lights single-phase 240V
Enclosed seating for 150 passengers	Propulsion: (4) Hamilton 362 water jets
Large windows and viewing deck	Fuel: (2) 1,200 gallon tanks
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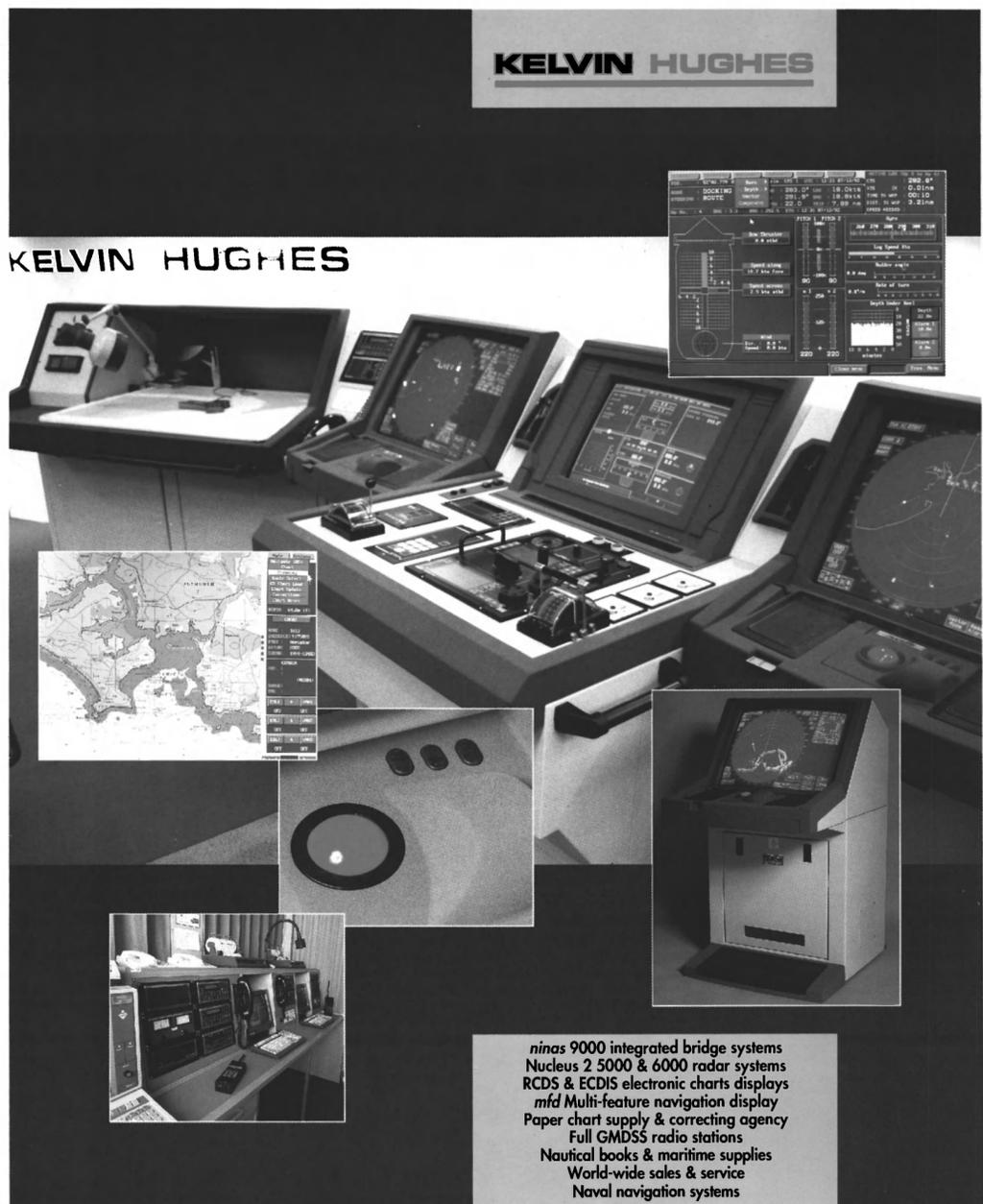
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Circle 25 on Reader Service Card

Marine Literature Review



Autoship Systems
Autoship Systems Corporation is the world's leading developer of PC software for naval architects. Building on its expertise in hydrostatics software, Autoship created stowage planning software to meet shipping industry needs. Other Autoship software capabilities include hull design and surface modeling, resistance and powering prediction, and internal structural modeling.
Circle No. 100



Reliable Supervision and Control
The SELCO M1000 Alarm Annunciator is a compact, 10-channel programmable unit with many features. An input signal originating from a potential free contact will cause the appropriate alarm LED's to flash, and simultaneously the related output to activate. Multiple M1000 units can be interconnected to form a large-scale alarm system.
Circle No. 101



Spurs Line and Net Cutter Systems
Spurs cut line and debris caught by propellers with each revolution of the shaft, eliminating propeller entanglement, oil seal damage, and resulting oil pollution. Spurs are used on thousands of Navy, Coast Guard and commercial vessels worldwide, from coastal tugs and fishing boats to supertankers.
Circle No. 102



Ship Globe Hose Valves Catalog
PENNDL, PA, U.S.A. Loeffler Corporation, a leading supplier of ship valves since 1926, offers a free catalog depicting globe type hose valves in 1-1/2 and 2-1/2 inch for 150 and 300 lb. commercial and 250 lb. Navy versions. Various options are available and all valves are 100% hydrostatically tested.
Circle No. 103



Viking Fenders
Viking Fender Company specializes in tugboat fendering for ship docking, barge and submarine handling. This brochure offers information on Viking Laminated recycled rubber fenders, featuring the Viking Softloop loop style fenders, Viking Softlite lonomer foam fenders, and Molded and Extruded rubber marine fenders.
Circle No. 104



Marine Protective Coatings
Sherwin-Williams, the largest supplier of high-performance protective coatings in North America, provides total coatings coverage for the commercial, offshore and government marine protection needs. Product lines include Dur-Plate, Macropoxy and Steel Master.
Circle No. 105



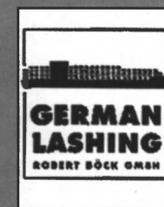
Fresh Water on Command
The new Sea Recovery Aqua Whisper Reverse Osmosis Desalinator produces more fresh water for your dollar, while requiring less energy. Production capabilities range from 400 to 1,500 gallons per day of pure drinking water. Improvements over past models include a new touch pad control panel, reduced power requirements, and a stainless steel high-pressure triplex plunger pump.
Circle No. 106



CSI
Founded in 1984, CSI's mobile construction teams have provided and installed quality marine interiors in over eighty vessels throughout the world, from cruise ships to casino boats. Specialties include joiner bulkheads/doors; ceiling systems; paint and wall coverings; tile and carpet and custom cabinetry and millwork. Turnkey proposals upon request.
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Circle No. 109



Scientific and Laboratory Services (SLS)

A new, full-color brochure entitled, "Scientific and Laboratory Services: Your Partner in Innovation" outlines the full capabilities of Pall Corporation's Scientific and Laboratory Services (SLS) in each of its major markets -- Health Care, Aeropower and Fluid Processing. **Circle No. 110**



Tampa Bay Shipbuilding

Conveniently located on the Gulf of Mexico near main shipping routes, Tampa Bay Shipbuilding & Repair Company is the only commercial shipyard equipped with three large graving docks and extensive crane facilities between Pascagoula, MS, and Hampton Roads, VA. **Circle No. 111**



Thor-Lube

Thordon Bearings, a pioneer in the development of pollution-free bearing designs, offers Thor-Lube, an environmentally friendly, stern tube bearing system. The Thor-Lube sealed system is comparable to conventional oil lubricated white metal systems, but uses proven non-metallic THORDON XL bearings and Thor-Lube, a non-polluting water-soluble lubricant. **Circle No. 112**



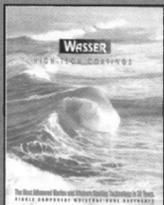
Northeast Industrial & Marine Equipment Supply

Specializing in hard-to-find parts, Northeast offers a variety of hydraulic motors, control valves, hydraulic hoses and fittings, pumps, winches, industrial hardware, electric motors, hydraulic power units, aluminum deck hatches, and other useful items. Located in Cape May, NJ, Northeast can be contacted at 1-800-884-3152. **Circle No. 113**



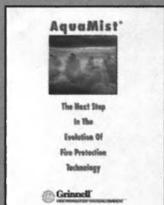
Cascade General Portland Shipyard

Cascade General offers one of the best equipped repair facilities in the industry, with world-class capabilities to service tankers, cruise ships, bulk carriers, container ships, government vessels, tugs, barges and workboats. In addition, Cascade General's Voyage & Small Vessel Repair Division provide mobile ship repair services up and down the West Coast of the United States and worldwide. **Circle No. 114**



Wasser High-Tech Coatings

Wasser uses a technology called single component moisture urethane, which has performed better in lab tests than any commercial system where two-part epoxy, urethane or inorganic zinc is used. Wasser Coatings have applications in on-board and dry-dock painting, as well as new construction. **Circle No. 115**



Aquamist Fire Protection Technology

The Grinnell Aquamist Marine System is a low-pressure automatic wet pipe system that can penetrate fires, absorb heat, strip room smoke, cool room gases, etc. Grinnell designs, engineers, manufactures, installs, inspects and services fire alarm detection equipment, sprinklers and special hazards equipment. Visit their website: www.grinnellfire.com **Circle No. 116**



CTI Industries

The patented Shield/Seal repair for condenser and heat exchanger tubes involves the installation of thin-walled alloy inserts - CTI Shield/Seals - into damaged tube ends. The "shields" are fabricated from a variety of erosion-resistant alloys. Tube ends are cleaned, the shields installed and expanded and installed into existing tubes, saving up to 90% versus the cost of traditional retubing. **Circle No. 117**



FastShip Design

FastShip, by Proteus Engineering, is an easy-to-use, yet powerful program for designing hulls, superstructures, appendages, and other marine structures. It provides the ability to design fair surfaces quickly and accurately to meet requirements for shape and hydrostatic qualities. Written by naval architects for naval architects. **Circle No. 118**



Autopilots That You Can Rely On

Since ComNav Marine's introduction in 1982, our autopilots have gained a reputation for top performance and reliability in even the harshest sea conditions. ComNav Marine has a broad line of autopilot systems and can offer products to serve virtually any commercial or pleasure boat application. **Circle No. 119**



Reverse Osmosis

Matrix Desalination, Inc. was established in 1987 to manufacture high quality reverse osmosis systems for seawater, brackish water, chemically polluted and biologically fouled water. Services include pilot plant design and operation, project engineering, site investigations, and more. This brochure includes specifications for various systems as well as replacement parts. **Circle No. 120**



BCM Trawl Blocks

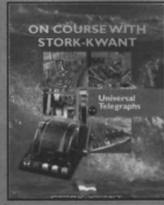
The latest addition to the line of blocks built by Skookum is the new 18" 25-ton BCM fullsided trawl block with improved wear resistant steel sheave. An additional feature is an elongated eye stem, designed to be stronger and longer lasting. Skookum is "engineered for extremes." **Circle No. 121**



DBC's Evacuation Slides

DBC has developed an efficient, accessible and cost effective marine evacuation system specifically for low freeboard vessels. A combination slide and platform stowed in an innovative place saving container provides safe, speedy evacuation for all passengers -- young, old and the physically challenged.

Circle No. 122



Stay on Course with Stork-Kwant

The Stork-Kwant Universal Telegraph operates various transmitters and signaling devices from one control lever; i.e. signals to remote control systems, telegraph orders, contacts for one-way alarm and order recording, etc. The single control lever operation offers a considerable saving in space.

Circle No. 123



Mackay Communications, Inc.

Mackay Communications, Inc. designs, installs and repairs satellite communications systems for offshore, marine and land-mobile applications. Mackay specializes in 64 Kbps data transmission, real-time video and voice communications. Worldwide installation, licensing and repair services are offered through Mackay Marine, a wholly owned subsidiary of Mackay Communications.

Circle No. 124



Jastram Steering Gear

Jastram Model S steering cylinders are specifically designated for commercial marine hydraulic steering service under the ABS-Type Approval Program. They are most frequently installed on commercial workboats, large passenger vessels, supply vessels, tankers and icebreakers, and can be used in either new steering system applications or in retrofit and repair programs.

Circle No. 125



ICG Satellite Services

ICG, based in Miami, has two divisions: Maritime Telecommunications Network (MTN), a major provider of C-Band voice, fax and data communications to the cruise industry, the U.S. Navy, and to offshore oil & gas platforms worldwide; the International Voice and Data (IVD) division provides satellite communications to U.S. backbone providers, foreign Internet Service Providers (ISP's) and telephony carriers. Circle No. 126



S&S Propeller

Family owned and operated for more than 50 years, S&S Propeller, with locations in Flushing, NY, and Pompano Beach, FL, offers a lengthy list of products and services, including computerized propeller sizing. Both locations stock propellers, shafting and related hardware to accommodate boat sizes from 15 to 150 ft..

Circle No. 127



Heavy Duty Deisel Engines

The Luger 6170A engine from Alaska Diesel Electric marks the return of the original diesel philosophy of long life, safety, dependability, and low life cycle costs. The 6170's remarkable fuel economy comes from superior engineering and four-cycle operation.

Circle No. 128



Heard The World Over

This brochure details certified sound signal systems from Airchime for commercial vessels under 75m. These include model KMJ air horns, enclosed and heated air horns, and automatic whistle controls. Installation instructions are also given.

Circle No. 129



Shipboard Automation

Tano Corp. designs, builds, and services shipboard information systems, including propulsion controls, boiler controls, alarm systems, and condition monitoring. Tano developed MS2000, a family of marine software systems available in the following configurations: machinery plant control and monitoring, steering control system, cargo/ballast control system, and damage control system.

Circle No. 130



SIMSMART

Applied High Technology Corporation (AHT) develops and distributes Computer Aided Engineering (CAE) software productivity tools and related engineering services. SIMSMART is a high-fidelity process and controls design tool that works through modeling and simulation. It enhances tactical advantage, ship survivability and saves time, money and lives.

Circle No. 131



Load Test Bags from Waterweights

Waterweights load test bags are used for suspended loads or deck loads using any number of bags for loads up to 600 tons. Special bags can be manufactured to any practical size or shape. They provide a load in place of traditional dead weights for all forms of load testing or ballasting. This highly certified system is safe, practical and economical.

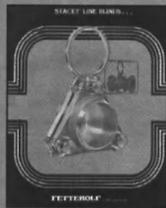
Circle No. 132



MacGREGOR Group

The MacGREGOR Group is the global market leader in shipboard cargo care products and their service. The products include hatch covers, cranes, RoRo equipment, shipboard elevators, air conditioning chillers, cargo securing systems and refrigerated cargo handling equipment.

Circle No. 133



Dead-Tight Shutoff

Stacey Spectacle Line Blinds, manufactured by Fetterhoff Corporation, provide positive dead-tight shutoff of liquids, gasses or slurries in piping 1-in. through 36-in. sizes. Stacey Spectacle Blinds are available in all ANSI pressure ratings; a wide range of sizes; all body materials and for service temperatures from cryogenic to elevated.

Circle No. 134



Kraissl Company

Kraissl offers you:

- Model 72 Simplex and Duplex Strainers and Filters to protect pumps and expensive pipeline equipment.
- Model 72AA series Transfer Valves used to duplex equipment with only one valve in minimum space.
- Model 60 Fuel Oil Transfer Pumpsets - U.L. listed for fuel oil. Both direct drive and V-belt drive versions.

Circle No. 135



Fail Safe Diesel Couplings

Renold Hi-Tec Couplings' new MSC Range for diesel engines has a maximum torque of 276,585 lb.-ft. It provides complete control of resonant torsional vibration and exceptional noise attenuation. The intrinsically fail-safe design features low linear stiffness, large misalignment capability and high heat capacity.

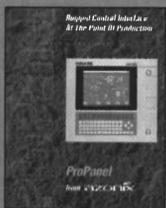
Circle No. 136



Signs For Safety

Maritime Associates Inc. manufactures and supplies a complete range of IMO/SOLAS safety signs and posters as well as LLL pathway systems. The company uses a number of materials in manufacturing, including the internationally certified American Permalight substance used to make the photoluminescent signs.

Circle No. 137



Going Beyond the Industrial PC

Put this robust reliable PC control/data display anywhere on your ship. Compare ProPanel's thin profile and compact footprint to bulky monitors and enclosures. Its totally sealed design excludes liquids, particulate, EMI/RFI, shock and vibration. The flat panel display is ideal on the bridge or in the engine room. Find us on the Web at: <http://www.azonix.com>, or call 800-365-1663.

Circle No. 138



Hubbell

Hubbell Electric Heater Company has more than 70 years in the marine and naval industry. Its shipboard water heaters are designed and manufactured specifically for marine installation. Hubbell carries a large inventory to ensure quick deliveries and product range to meet all hot water needs.

Circle No. 139



New England Marine and Industrial

New England Marine and Industrial has three convenient locations in the Northeast: Portsmouth, NH; Brant Rock, MA; and Stonington, ME. Since 1976 they have carried "from anchors to zincs and everything in between," including chain and fittings, Hooven Allison ropes, Stearns safety gear, and a full line of tuna gear.

Circle No. 140



Pelican Rope Works

Considered the Best Value on the market, Pelican Rope manufactures braided ropes with a hard-to-beat quality, price and customer service. Double-Braid/12-Strand/8-Plait, sizes from 3/16" to 1.24" diam., Nylon/Polyester/Spectra/Kevlar. Colors and urethane coatings available. Thanks for calling 800-464-ROPE.

Circle No. 141



Integrated Waterjet Propulsion

Volvo Penta delivers complete waterjet packages including engine, waterjet, gearbox, shafting and control systems. For each application Volvo Penta produces accurate thrust curves based on the nominal service speed of the vessel. This is the first time a complete waterjet propulsion package has been delivered, serviced and supported by the same supplier.

Circle No. 142



Marine Fire Protection

Thermax non-combustible, non-toxic, marine construction boards are used worldwide for joiner bulkheads, panels, liners, ceilings, door and furniture cores. Thermax has all major regulatory body certificates (USCG, Canada, DNV et al) and meets the requirements of IMO/SOLAS resolutions. Thermax is sold, distributed, warehoused, laminated and cut to size in North America by PSI.

Circle No. 143



ZF Marine Transmissions

ZF Marine is the world's largest supplier of marine transmissions, covering a power range from 10 to 10,000 hp, and has manufacturing locations in Italy, Germany, Brazil and the USA. ZF Marine produces heavy-duty gears for all types of workboats as well as fast ferries and naval craft. Among the larger gears (above 1400 hp), the BW 361 and BU 5300 gears were exhibited at SMM '98.

Circle No. 144



Big Blue

Big Blue, manufactured by Electronic Marine Systems Inc., is designed for use by shipboard personnel to view the complete loading operation in one glance. It is built for the harshest environments of temperature, water, salt and vibration and is approved by both the ABS and USCG in full compliance for on-deck cargo operations.

Circle No. 145



Scana Volda

Scana Volda is an independent supplier of propulsion equipment designed and manufactured in-house, along with CP-propellers, ships gears and rudders. The Scana Volda electronic remote control system monitors the status of the propulsion system, using PLC (Programmable Logic Control) to link several control panels together.

Circle No. 146



Blasts Your Costs Away

The VT 1150 from VT Blast can blast up to 90% of hull areas. Use of the VT 1150 provides a clean, dustfree surface with predictable and measurable surface roughness offering superior coating. Dust-free and leaving minimum contaminated grit disposal behind, the VT1150 is the most environmentally friendly, clean and safe method of surface preparation.

Circle No. 147



Specialty Products and Lubricants

In 1949, Jet-Lube developed a specialized compound addressing the drilling and completion problems of heat, corrosion and friction better than any other product available. Since the 1980's, Jet Lube has led the way in development of environmentally acceptable lubricants, sealants and related specialty products.

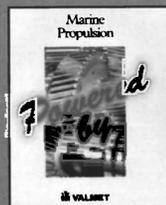
Circle No. 148



Construction and Repair

From its location in Northwest Florida, Eastern Shipbuilding Group is a leading innovator in marine construction and repair. Eastern uses state-of-the-art CAD techniques, numerical control plasma arc cutting, and submerged arc welding systems and modular construction techniques to ensure that vessels are delivered on time.

Circle No. 149



Drive Solutions

Valmet Power Transmission is one of the world's leading suppliers of gears, couplings and drive systems for shipbuilding applications. Valmet has equipped nearly 600 vessels with individualized marine gear machinery. And when better reliability, lower noise and vibration levels, and greater safety are required, Valmet also can provide the perfect re-engining solution.

Circle No. 150



Next Generation Turbochargers

Representing the next generation of quality 'large' turbochargers for medium speed diesel engines, the NAPIER 458 and 558 Turbochargers from Alstom provide capacities from 4MW to 11MW for a single turbocharger installation. Offering outstanding thermal efficiencies and high-pressure ratios, these NAPIER turbochargers include the very latest technology.

Circle No. 151



Houston Marine Training

As the Global Maritime Distress and Safety System (GMDSS) nears full implementation, forward-looking companies are realizing the full impact this SCTW requirement will have. Houston Marine is one of only a few training companies in the United States currently offering a U.S. Coast Guard-approved course for GMDSS operators. We can ensure that your crew is prepared.

Circle No. 152



Safe Scale Removal

Delta's complete line of chemical formulations is designed to safely remove water scale, rust and lime deposits formed in any water-operated equipment. With Delta's line of products, most equipment can be cleaned in a matter of a few hours -- with your own personnel and without dismantling. Delta can provide the specific properties to remove the most stubborn deposits.

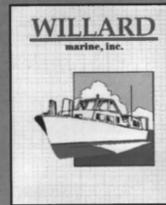
Circle No. 153



CIT: In It for the Long Haul

Where do you find a lending partner with substantial financial resources, flexibility and a long-term dedication to your industry? With a maritime portfolio of more than half-a-billion dollars, the CIT Group/Equipment Financing is a recognized leader in fleet and equipment financing to barge and towing companies, coastal marine companies, marine terminal operators and shipyards.

Circle No. 154



Fiberglass Boats

Willard Marine, Inc. is a leading manufacturer of fiberglass boats for the U.S. Navy and Coast Guard. Willard Marine, Inc. specializes in building 26' to 40' Personnel Boats and 33' to 50' Utility Boats for the U.S. Navy, as well as constructing Ports and Waterways and Surf Rescue Boats for the U.S. Coast Guard. They recently added a new and versatile class of Rigid Inflatable Boats (R.I.B.).

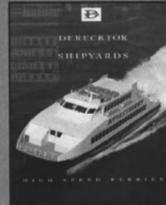
Circle No. 155



Barges from Zidell

Zidell Marine Corporation builds barges. Any kind, size or type you want. Built for toughness, durability, and a long working life, there are more than 300 double and single hull barges with the Zidell name on them currently hauling such diverse commodities as lumber, grain, chemicals, petroleum products, general freight, sand, gravel, and wood chips.

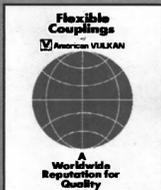
Circle No. 156



High-Speed Ferries

In 1997 two high-speed passenger catamarans went into service in America's most visible venue, the New York Harbor. Operating at 35 knots, with a capacity for 350 passenger, they immediately became the largest, fastest passenger ferries in the country. Their builder Drektor Shipyards, now brings its expertise in aluminum yachts and commercial vessels to high-speed passenger ferries.

Circle No. 157



American VULKAN Corporation
This four-page color catalog introduces the RATO couplings for diesel and electric motor-driven equipment such as marine propulsion, compressors and two-bearing generators. It includes VULKAN Couplings for shock absorbing, alignment correcting and torsional vibration control.
Circle No. 158



Portable Ventilators/Dehumidifiers
Dry Air Technology designs, engineers and manufactures custom fans, ventilation equipment and dehumidifiers. We offer a full line of high performance, portable, lightweight ventilators and dehumidifiers. Made of high-density polyethylene, these durable, maintenance-free, corrosion-resistant products are perfect for heavy industrial needs. **Circle No. 159**



Motivators Conferences L.L.C.
The 1999 conferences in the New York City schedule of events includes the following: January - Incidents Response; February - Harbor Safety/ Navigation Operations Committees; March - Dredging; March - Severe Storm at Sea/ Night of Heroes; April - High-Speed Ferry Northeast Conference; May - International Maritime Hall of Fame.
Circle No. 160

Mark Your Calendar Now...

so that your company will not miss any of **Maritime Reporter & Engineering News'** Marine Literature Review opportunities in 1999. For details, contact your advertising sales representative, or the marketing manager @ tel: 212-477-6700.

1999 Marine Literature Review Schedule

April May August
October December

Contract Awarded To Reactivate LNG Southern

Argent Marine Services, owner of the LNG carriers Southern and Arzew have signed a contract with Norfolk Shipbuilding and Drydock Corp. (NORSHIPCO) to reactivate the Southern in 1999. The vessel is expected to enter the shipyard in January, to undergo gas trials in October and to begin operating under a time charter to Shell Bermuda (Overseas) Ltd. (SBOL) in November 1999. Argent Marine Operations (AMO) will manage the reactivation and will oversee all aspects of the construction and repair work, sea trials and certification. Drydock work will include a complete cleaning and painting of the underwater hull, tailshaft and sea valve inspection and renewal of the bowthruster.
Circle 78 on Reader Service Card

Blount Contracted For Dinner Cruise Vessel

Horizon Cruises, Inc. of New York Harbor has signed a \$4 million contract with Blount Industries to design and construct a 161-ft. (49 m) dinner cruise vessel scheduled for completion in November 1999. The 600-passenger vessel will be powered by two 620 hp 16V-92 Detroit Diesel engines and will be equipped with two 200 kW Detroit generators. The vessel will be built with three enclosed decks, providing a yacht-style dining experience. A full width sun deck is accessible from all other decks and offers a prime viewing area. Added design features will include aft balustrades

on each deck, plus an elevator for service and handicap access.
Circle 79 on Reader Service Card

Consortium Providing Chem Tanker Propulsion

The Chinese Shanghai Edwards Shipyard has awarded the Siemens-Schottel Propulsor (SSP) consortium the contract for a SSP 7 with a power rating of 5.1 MW. The newly developed pod drive is to be installed in a 19,500 dwt chemical tanker ordered by the Swedish company Rederi AB Donsotank. Designed by FKAB in Uddevalla (Sweden), the tanker will be built in accordance with DNV Ice Class 1A and is scheduled to be delivered in April 2000 for future operation in the Baltic Sea.
Circle 82 on Reader Service Card

Furuno Nears Completion Of Major GMDSS Contract

Furuno U.S.A. is nearing fulfillment of a contract to supply 200 of its RC1515 GMDSS consoles to offshore service vessel company, Tidewater Marine. G.S.I. Marine, a Furuno marine electronics dealer in New Orleans, La., arranged the sale and coordinated the installation on Tidewater Marine vessels worldwide.

Each compact console consists of several units integrated to form a complete communications center. They include a Furuno FS1562-15 radiotelephone, DSC6 MF/HF DCS Terminal, DP6 NBDP Terminal, AA50 MF/HF DSC Watch Receiver and the Felcom 12 Inmarsat-C MES. The individual components of the GMDSS system are manu-

factured by Furuno Electric Company in Japan, with the consoles themselves fabricated, assembled, pre-wired and tested at Furuno's Denton, Md. facility.
Circle 51 on Reader Service Card

OSL Awarded Chinese Oil Company Contract

Offshore Systems & Deck Machinery LLC (OSL) has been awarded a major contract from Shengli Petroleum Administration Bureau for the complete rack and pinion jacking system and associated structural components for the Shengli #3 jackup platform which is to be constructed in China.

DRS Will Produce Navy Display Workstations

DRS Electronic Systems Group, part of DRS Technologies Inc., has been awarded \$33.5 million in new contracts from Lockheed Martin Tactical Defense Systems to produce additional AN/UYQ-70 Advanced Display Systems and computer peripheral equipment for the U.S. Navy. The computer workstations are being installed on the most technologically advanced surface ships, submarines and aircraft in the U.S. Navy fleet.

Hornblower To Manage Caesars Indiana

Caesars Indiana has chosen Hornblower Marine Services to manage all Marine Department responsibilities. This includes the development, implementation, and management of U.S. Coast Guard (USCG) inspections, emergency

drills team member hiring and day-to-day marine operation of the M/V Glory of Rome, reportedly the world's largest riverboat gaming vessel.

Strong Order Boost For Umoe Schat-Harding

Umoe Schat-Harding, a supplier of evacuation equipment and systems to the shipping, offshore and cruise industry, has seen orders for lifeboats and davits boom over the last quarter. Passengership sector orders include 14 150-person lifeboats and four CTL38 cruise tenders for the Royal Caribbean Cruise Lines (RCCL) newbuilding program at Meyer Werft.

BBE Awarded HVAC Installation Contract

Friede Goldman Offshore Inc. has awarded Bill Brown Enterprises, Inc. (BBE) a contract for the installation of the heating, ventilation and air conditioning (HVAC) systems on the Bingo 9000 Mobile Offshore Drilling Units (MODU).

Manitowoc Nabs Mobil Barge Contract

Manitowoc Co. Inc. won a contract to build a twin-hull, 140,000-barrel ocean-going tank barge for Mobil Oil Corp., for delivery to enter service in early 2000. It will haul refined petroleum products to major metropolitan markets along the Eastern Seaboard and Hudson River. Manitowoc specializes in ship repair work for vessels operating on the Great Lakes.

BUYERS DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER. 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 assumes no responsibility for errors. If you are interested in having your company listed in this Buyers Directory Section, contact Angela Criscola at (212) 477-6700.

- ADHESIVES**
Adtech Marine Systems, 815 W. Shepherd St., Charlotte, MI 48813
- AIR CONDITIONING AND REFRIGERATION - Repair & Installation, Equipment & Services**
AES Fluid Marine, Box 1043, S-438 21 ASKIM SWEDEN
Adrick Marine, 81 Mahan St., West Babylon, N.Y. 11704
Bailey Refrigeration Co., 2323 Randall Ave., Avenel, NJ 07001
Carrier Transicold, P.O. B. 4005, Syracuse, NY 13221
Refrigeration Resources, 210 Westside Ave., Jersey City, NJ 07305
RTF Manufacturing, 793 Route 66, Hudson, NY 12534
Adrick Marine, 81 Mahan St., West Babylon, N.Y. 11704
Bailey Refrigeration, 2323 Randall Ave., Avenel, NJ 07001
RTF Manufacturing, 793 Route 66, Hudson, NY 12534
Unter Ship Service Inc., 2375 West Esther Street, Long Beach, CA 90813
Stork Canada, 47 boul. Marie-Victorin, Candiac, Quebec, Canada, J5R 1B6
- ALARMS, FACTORY MUTUAL-APPROVED**
Datostar Marine Products Inc., Unit 100 18 Goslick Pl., N.Vancouver, Canada V7M5G31
SELCO 353 A Albany Commons Dr., Atlanta, GA 30338
- ALUMINUM BOATS**
American Eagle Mfg., P.O. Box 597, La Conner WA 98257
Manson Mfg., P.O. Box 597, La Conner WA 98257
- ANCHORS AND CHAINS**
Al Alpha Int'l., Inc., P.O. Box 48985, Cincinnati, OH 45249
Crandall Dry Dock Engineers Inc., P.O. B. 50580A, MA 02150
G.J. Worlesborer Jr. BV, P.O.B. 5003, 3008 AA Rotterdam, Netherland Chain, 230 Avenue Desandrouins, 95300 Valenciennes FRANCE
Washington Chain Inc., Box 3645, Seattle, WA 98124
Waltman Supply Co., P.O. Box 596, Wilmington, CA 90748
Willem Pot, P.O.B. 29102, 3001 GC Rotterdam
- AUTOMATION SYSTEMS**
Electronic Design, 2020 20th St., Metairie, LA 70002-4911
- AUTOPILOT SYSTEMS**
Maskey Communications, 2721 Discovery Dr., Raleigh, N.C. 27616-1851
Conner Marine, 1915 Stainsburg Ave., Vancouver, B.C. CANADA
- BALLAST**
Ballast Technology, 4620 S. Coach Dr., 85714, Tucson, AZ
Reifand Genstar Inc., Executive Plaza IV, Hunt Valley, MD 10912-1033
P.O. B. 40847, Cleveland 2022 SOUTHWEST AFRICA
- BASKET STRAINERS**
Beard Industries Inc., 601 Benton Kelly St., Shreveport, LA 71106-7199
- BATTERY CHARGERS**
Newmar, 2911 West Garry Ave., Santa Ana, CA 92863
- BEARINGS - Rubber, Metallic, Non-Metallic**
Bohm & Voss Industrie GmbH, P.O. B. 100720, D-2000 Hamburg 1, GERMANY
Simplex-Tumar Inc., P.O. B. 186, Little Neck, NY 11363-0168
U.S.A. Repe
Ralko Ltd., Loudwater, High Wycombe, Bucks
Hamshire ENGLAND HP190V
Kaltenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Orion Corp., 1111 Cedar Creek Rd., Grifton, WI 53024
Duramax Marine, 16025 Johnson St., Middlefield, OH 44062
Thordon Bearings Inc., 3025 Manway, Burlington, Ont., CANADA L7M 1A6
NTN Bearing, 1600 E. Bishop Court, Mt. Prospect, IL 60056
Vesco Plastics, P.O. B. 40847, Cleveland 2022 SOUTHWEST AFRICA
- BILGE SYSTEMS**
Nelson Div., Exhaust & Filtration Sys., Hwy 51 West, P.O. Box 428, Stoughton, W. Mass., MA 02159
- BLOCKS & RIGGING**
Stookum, P.O. Box 280, Hubbard, OR 97032
- BOAT RENTAL**
Edson Chouest, P.O. Box 309, Galliano, LA 70354
- BOILERS**
B & D Marine & Boilers Inc., P.O. Box 71687, Charleston, SC 29415
- BOILER MAINTENANCE**
Technical Marine Services, 8040 North Cutler Circle, Portland, OR 97217
- BOX COOLERS**
Storv Machinery Int'l., 8375 N.W. 56 St., Miami, FL 33166
- BRIDGE WIPERS**
In-Mar Systems, Yellowstone Street, Kenner, LA 70064
- BROKERS**
151 Maritime Services, 34062 El Encanto, Dana Pt. CA 92629
Crestair Astad Company, Inc., P.O. Box 350486, Ft. Lauderdale, FL 33335
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 SEAL/PANELS**
CSD North America, 880 Candia Rd., Unit 10, Manchester, NH 03109
Böhm & Voss Industrie GmbH, P.O. B. 100720, D-2000 Hamburg 1, GERMANY
Parnet Specialists, Inc./Thermax, 3115 Range Rd., Temple, TX 76701
Ralko Ltd., U.S.A. Repe: Simplex-Tumar Inc., P.O.B. 675, Tonawanda, NY 14151-0675
Roni Corp., 12402 E. 60th St., Tulsa, OK 74146-6922
- CABLE TRANSIT SYSTEMS**
CSD North America, 880 Candia Rd., Unit 10, Manchester, NH 03109
O-Z Gedney • Nelson Frestop, P.O. B. 726, Tulsa, OK 74101
Roni Corp., 12402 E. 60th St., Tulsa, OK 74146-6922
- CAD/CAM SYSTEMS**
Abaco Research, 4196 Kashton Place, Victoria, B.C. Canada V8K4L7
Al Alpha Int'l., Inc., P.O. B. 48985, Cincinnati, OH 45249
Autoshop Systems Corp., #403, 611 Alexander St., Vancouver, BC, Canada V6A1E
Creative Systems, Inc., P.O. B. 1910, Port Townsend, WA 98368
MSA, 13 Jenkins Court, Suite 200, Durham, NH 03824
Kokum Computer Systems AB, PO Box 50555, S-202 15 Malmö SWEDEN
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029
- TMSCO, P.O. B. 91360, Mobile, AL 36691
Ship Motion Associates, 10 Danforth St., Portland, ME 04101-4567
- CARGO MONITORING & CONTROL SYSTEM**
Ian-Connard Bergen, Inc., 3409 Gulf Breeze Parkway, Gulf Breeze, FL 32561
Radio-Holland USA, 8943 Gulf Freeway, Houston, TX 77017
- CHAINS**
Columbus McKinnon Corp., 140 John James Audobon Pkwy., Amherst, NY 14228
New England Marine & Industrial, 200 Spaulding Turnpike, Portsmouth, NH 03801
Washington Chain, P.O. Box 3645, Seattle, WA 98124
- CHARGE AIR COOLERS**
Globe Heater, 17 Grandview Ave., W. Orange, NJ 07052
- CHEMICALS**
Uniservice Americas, 57174 Hardin Rd., Sidell, LA 70461
Unter Ship Service Inc., 2375 W. Esther St., Long Beach, CA 90813
- CLASSIFICATION SOCIETY**
American Bureau of Shipping, 9 World Trade Center, 106th Fl., New York, NY 10048
- CLEATS**
Dei Norske Veritas, 70 Grand Ave., Riveredge, N.J. 07661
- CLUTCHES**
Haley Clutch and Coupling Corp., 1820 Hwy. 1 North, Greenville, MS 38702
- COATINGS / CORROSION CONTROL / PAINT**
Easton Chemical Co., 234 Lawrence Ave., South San Francisco, CA 94080
Corrosal, Inc., 8114 304th Ave., SE, Preston, WA 98050
Nase Int'l., 1440 South Creek Dr., Houston, TX 77084
Encoast Corporation, 125 Baylis Rd., Melville, NY 11747-3800
Egand, Inc., P.O. Drawer 2698, Lafayette, LA 70502
Faro Corp., 1301 North Fresa St., Plymouth, IN 46563
Jameson Dairb, P.O. Box 348, Jameson, WI 02835
Graeco, Inc., P.O. Box 1441, Minneapolis, MN 55440-1441
Hempel Coatings, 6901 Cavalcade St., Houston, TX 77028
Suffield Industries, 2081 Bridgeview Dr., N. Charleston, SC 29405
Signal Coatings, P.O. Box 816, Houston, TX 77029, 330 Harvey, LA 70059
Atlantic Systems Supply Co., 1100 Adams St., Hoboken, NJ 07030
TNO Institute of Industrial Technology, P.O.B. 3, 2600 AA Delft, Netherlands
Boatfile, 2081 Bridgeview Dr., N. Charleston, SC 29405
Unter Ship Services Inc., 2375 West Esther Street, Long Beach, CA 90813
- COMMERCIAL DIVING COMPANIES**
Cruzan Divers Inc., 300 Strand St., Frederickssted, Virgin Islands 00940
- COMMUNICATION AUTOMATION**
International Communications, 814 Diligence Dr. Ste 120, Newport News, VA 23066
- COMMUNICATIONS SYSTEMS**
Hose McCann, 1241 W. Newport Gender, Deerfield Beach, FL 33442
ICG Satellite Services, 8400 NW 52nd St., Suite 110, Miami, FL 33166
Maritime Telecommunications Networks, Inc., 8400 NW 52nd St., Suite 110, Miami, FL 33166
Azcom Tabeo AB, Eppendorfer Weg 23A, 20251 Hamburg, GERMANY
AT & T Maritime Services, 412 Mt. Kemble Ave 5170, Morristown, NJ 07960
Comair Maritime Services, 6560 Rock Spring Drive, Bethesda, MD 20817-1146
Newmar, 2911 West Garry Ave., Santa Ana, CA 92863
Watercom, 458 E. Park Place, Jefferson, IN 47130
- COMPACTORS/FILTER CRUSHERS**
Tech Oil Products Inc., 4308 W. Admiral Doyle Dr., New Iberia, LA 70560
- COMPOSITE PROCESSING**
Composite Technology Consultants, Inc., 12310 Northwinder Row, Bayview Point, Fla. 34667
- COMPOUNDS**
ITW Philadelphia Resins, 130 Commerce Dr., Montgomeryville, PA 18936
- COMPUTER LOFTING**
Baratania Lofting Co., Inc., 1616 Baratania Blvd., Ste. 4, Manro, LA 70072
- COMPUTER / COMPUTER SOFTWARE**
Autoshop Systems Corp., #403, 611 Alexander St., Vancouver, BC, CANADA V6A1E
Chand Corporation, 107 Hwy 654, Mathews, LA 70375
Coastal Oceanographics, Inc., 11-G Old Indian Trail, Middlefield, CT 06455
Senec, C-Svevo Cooch, 4 Parque Tecnologico de Madrid, 28760 Tres Cantos - Madrid SPAIN
Invecolor Corp., 2150 Boggs Rd., Deats, GA 30396
Creative Systems, P.O. Box 1910, Port Townsend WA 98368
Lloyd's Register, 100 Leadenhall St., London, England EC3A 3BP
Ship Motion Associates, 10 Danforth St., Portland, ME 04101
Aroni Corp., 800 Middlesex Tpk., Billerica, MA 01821
Proteus Engineering, 301 Pier One Rd., Stevensville, MD 21665
- CONDENSERS/SEPARATORS**
Beard Industries Inc., P.O. Box 31115, Shreveport, LA 71130
- CONSTRUCTION MATERIALS**
Adtech Marine Systems, 815 W. Shepherd St., Charlotte, MI 48813
- CONSULTANTS**
Hornbower Marine, Pier 3 Ferryboat Santa Rosa, San Francisco, CA 94115
- CONSOLE - GMDSS**
Mackay Communications, 2721 Discovery Dr., Raleigh, N.C. 27616-1851
- CONTROL SYSTEM - Monitoring/Steering**
Engine Monitor, Inc., 179 Hickory Ave. Harahan, LA 70123
GEC ALSTHOM Diesels Inc., 10801 Kempwood Drive, Suite 1, Houston, TX 77043-1412
Ian-Connard Bergen, 3409 Gulf Breeze Pkwy, Gulf Breeze, FL 32561
- Gems Sensors Division, One Cowles Rd., Plainville CT 06062
MMC International, 60 Inp Dr., Inwood NY 11096
Robertson Marine Systems, 3000 Kingman St., Suite 207, Melrose, LA 70006
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029
Kobell Mfg. Co. Ltd., 2938-129 St. Surrey, B.C. V3M0A6
Stork-Kwart BV, P.O.B. 23, 8600 AA Sneek, Netherlands
Electronic Marine Systems, 800 Fendale Pl., Rahway, N.J. 07065
Autoklav Marine Systems Inc., 55A Clipper St., Coquitlam, B.C., Canada V0K 0X2
Kokum Sonics, Inc., 819 Veterans Blvd., Suite 201, Kenner, LA 70068
- CONTROL VALVES**
Leslie Controls, 12501 Telecom Dr., Tampa, FL 33637
- CONVERSIONS & REPAIRS**
Crestair Astad Company, 30 Pemberton Ave., N. Vancouver, B.C. CANADA V7P 2R2
- COOLERS/FREEZERS**
Kaiser Engineers, 2112 SE 8th Ave., Portland, OR 97214
- COUPLINGS**
Mapoco Products, 91 Wilberbrock Rd. Unit B, Oxford, CT 06478
Crispe Corp., 8185 Cass Ave., Danes, IL 62551
Haley Clutch and Coupling Corp., 1820 Hwy. 1 North, Greenville, MS 38702
Fasterline, P.O. Box 103, Shippack, PA 19474
Lo-Ric Vibration Control, Ltd., 186 West 8th Ave., Vancouver, B.C. V5Y 1N2
American Vulcan, P.O. Drawer 673, Winter Haven, FL 33882
MMC Int'l., 60 Inp Drive, Inwood, NY 11096
Renold Hi-Tec, 512 W. Cresscarnhill Rd., Cincinnati, OH 45246
- CRANKSHAFT - DERRICK - WHIRLEYS**
Lake Shore Inc., P.O. Box 809, Iron Mountain, MI 49801, 1150 Baso Marine Co., P.O. Box 4113, New Orleans, LA 70178
Hullbush Corp., P.O. Box 51, Clear Shores, MI 48080-0086
Edgewater Machine & Fabricators, P.O. Box 358, Edgewater, FL 32132-0358
Marine Traveler, Inc., 49 E. Yew St., Sturgeon Bay, WI 54225
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Bloomington, IL 61801
- CRANKSHAFT DEFLECTION ANALYZER**
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
- CRANKSHAFT REPAIR**
In-Place Machining, 1929 North Bufum St., Milwaukee, WI 53212
- CUSTOM CABLE CONNECTOR**
Tachtinger & P.O. Box 10, Drachten, Netherlands, 8200AA
Wein Lombe N.A. Inc., 18 Ridgeway Drive, Bridgewater Nova Scotia, Canada B4V 3 V6
- CUSTOM CLOSURES**
Yalitz & Krenzer, 91 Wilberbrock Rd., Oxford, CT 06478
- CYLINDER LINES**
Sisan A.S., P.O. Box 127, TR-01210 Adana, Turkey
- CYLINDER LOAD ANALYZER**
Gertsen Thermotronics, 210 South Meadow Rd., Plymouth, Ma. 02360
- DAVIS SYSTEMS**
FCS, Inc., 22 Main St., Centerbrook, CT 06409
Holly Host Corp., P.O. Box 809, Iron Mountain, MI 49801, 1150 Holly Host Corp., P.O. Box 86, St. Clair Shores, MI 48080-0086
Wein Lombe N.A. Inc., 18 Ridgeway Drive, Bridgewater Nova Scotia, Canada B4V 3 V6
- DECK MACHINERY - Cargo Handling Equipment**
Lake Shore Inc., P.O. Box 809, Iron Mountain, MI 49801, 1150 Markey Machinery Co., Inc., P.O. Box 24788, Seattle, WA 98124-0788
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Bloomington, IL 61801, 39535-4454
Stookum, Inc., P.O. Box 280, Hubbard, OR 97032
Sempco Marine Inc., 3721 5th Ave., Seattle, WA 98104
Intercontinental Engineering, P.O. Box 9055, Kansas City, MO 64168
Edgewater Machine & Fabricators, P.O. Box 358, Edgewater, FL 32132-0358
New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150
Pursnes, PO Box 102, N-4818, Faerik, NORWAY
Smith Berger Marine Inc., 516 South Chicago St., Seattle, WA 98108
Timberland Equipment, P.O. Box 490, Woodstock, Ontario N4S 7Z2 CANADA
Waterman Supply Co., P.O. Box 596, Wilmington, CA 90748
- DEHUMIDIFIERS**
Dry Air Technologies, 313 N. Oak St., Burlington, WA 98233
- DESALINATION - REVERSE OSMOSIS**
Shipposec SV12 CAN, England
Hemont Marine Inc., 3528 Griffin St., Laurent, Quebec Canada
GEC ALSTHOM Diesels Inc., 10801 Kempwood Drive, Suite 1, Houston, TX 77043-1412
- DESIGN CONSULTING**
Fleet Technologies, 311 Leggett Dr., Kanata, Ont. K2K 1Z8 Canada
FCS, Inc., 22 Main Street, Centerbrook, CT 06409
Iron Research & Marine Street, Elnesmeer, Shipposec SV12 CAN, England
Hemont Marine Inc., 3528 Griffin St., Laurent, Quebec Canada
Sempco Marine Inc., 3721 5th Ave., Seattle, WA 98104
Intercontinental Engineering, P.O. Box 9055, Kansas City, MO 64168
Alaska Diesel, 4420 14th Ave. NW, Seattle, WA 98107
Borginone Services Ltd., 48 Wang Lok St., Yuan Long Hemont Marine Inc., 3528 Griffin St., Laurent, Quebec Canada
Industrial Estate, New Territories, HONG KONG
Caterpillar, Inc., Engine Div., P.O. Box 610, Meseville, IL 61552-0610
Castro S.p.A., Viale Mazzini, 161, 20061, Abbiategrosso, ITALY
Cummins Engine Co., 4500 Leeds Ave., Ste. 301, Charleston, SC 29405-8521
Cummins-Mc-Scath, Inc., 110 E. Airline Highway, Kenner, LA 70062
John Deere, John Deere Rd., Moline, IL 61265
Haupt Canada, Inc., 4420 Garand St., Montreal, Que. HAR 2A3
DMI Norsphco Co., P.O. Box 2100, Norfolk, VA 23501-2100
GEC ALSTHOM Diesels Inc., 10801 Kempwood Drive, Suite 1, Houston, TX 77043-1412
- Kaltenberg Marine, 17 Grandview Ave., W. Orange, NJ 07052
MAN B&W Diesel AG, Stadtbachstrasse 1, D-86153 Augsburg 1, GERMANY
Canadian Marine Systems, Inc., P.O. Box 660, West Elizabeth, PA 15088-0660
Air Marine Systems, 2701 Sonic Dr., Virginia Beach, VA 23456
MAN B&W Diesel AG, Tagelholmsgade 41, DK-2450 Copenhagen SV, DENMARK
MAN B&W Diesel, 17 State St., New York, NY 10004
Motor-Service AB, Box 2115, S-144 04 Roninge, SWEDEN
Motor-Service-Hugo Stamp, 3190 S.W. 4th Ave., Ft. Lauderdale, FL 33315
Fluid Mechanics Inc., 4521 W. 160th St., Cleveland OH 44135
Parron Diesels, P.O. Box 8, Parron Works, Cochester, Essex, CO1 2HW ENGLAND
Ustlen Bergen AS, PO Box 924, NS302 Bergen, NORWAY
Wartsila Diesel, 201 Defense Highway, Annapolis, MD 21401
Gotters, 160 Van Brunt St., Brooklyn, NY 11231
CMB Cummins Engine Co., 500 Jackson St., Columbus, IN 47202
FM / Alco 701 Lawton Ave., Beloit, WI 53511
Gottens, 160 Van Brunt St., Brooklyn, NY 11231
Kline Diesel, 525 South Farmers, Addison, IL 60101
Deutz Canada Inc., 4420 Garand St., Montreal, Que. HAR 2A3
- DIESEL FUEL DECONTAMINATION**
Fuel Dynamics, 707 Muller Dr., 1110, Case Canaveral, FL 32920
- DIGITAL TORQUE METER SYSTEM**
Instruments Computers & Controls, 70 South Bow Rd., Hooksett, NH 03038
- DIVING & SALVAGE**
Coast Diving Services, Inc., 793 B Mira Flores, San Pedro CA 90733
Basco Marine Co., P.O. Box 4113, New Orleans, LA 70178
H.J. Merrin, P.O. Box 21323, New Orleans LA 70183
JW Finnen, 65 Anthony St., Berkley, MA 02779
South Texas Underwater Divers, 2921 16th Ave. North, Texas City, Texas 77590
Mudbon Marine Services, Inc., P.O. Box 3221, Terminal Island, CA 90731
- DOCK BOXES**
Beltway Products, 70891 County Rd. 23, New Paris, IN 46653
- DOCK FENDERING SYSTEMS**
Seward Int'l., P.O. Box 98, Clear Brook, VA 22624
Plastic Piling Inc., 1485 South Willow Ave., Rialto, CA 92376
Poly In Solid, 2710 American Way, Fort Wayne, IN 46889
Urethane Products Corp., 17007 South Broadway, Gardena, CA 90248
- DOORS - MARINE & INDUSTRIAL**
Baron Int'l., 1101 Edwards Ave., Jefferson, LA 70181
Mapoco, Inc., 80 Forest Ave., Locust Valley, NY 11560
Walz & Krenzer, 91 Wilberbrock Rd., Unit B4, Oxford CT 06478
Marine Accommodations, Inc., 3530 Wilsberg Park Blvd., Building 7, Jacksonville FL 32257
Railway Specialties Corp., 2979 State Rd., P.O. Box 29, Raleigh, PA 19007
- DRY DOCKS-Design**
Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381
Crandall Dry Dock Engineers Inc., P.O. Box 50580A, Chelsea, MA 02150
Hull Dry Dock Engineers, Inc., P.O.B. 6605, Holliston, MA 01746
Poly In Solid, 2710 American Way, Fort Wayne, IN 46889
- DOUBLE HULL TECHNOLOGY**
Kobon, 1915 Market St., Philadelphia, PA 19103
- DUCTORS**
Vita Molitor, 566 Parker St., Newark, NJ 07104
- ELECTRICAL EQUIPMENT**
Baylor Co., 500 Industrial Blvd., Sugarland, TX 77478
L. F. Gaubert & Co., Inc., P. O. Box 50500, New Orleans LA 70150
MMC International, 60 Inp Dr., Inwood NY 11096
Air Marine Systems, 2701 Sonic Dr., Virginia Beach, VA 23456
Sempco Marine Inc., 3721 5th Ave., Seattle, WA 98104
Lauderdale, FL 33314
- ELECTRICAL MOTOR DRIVES**
Tech Power Controls, 10850 S. Wilcrest, Houston, TX 77099
- ELECTRONIC INFORMATION SUPPORT**
Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolbotn, NORWAY
- ELEVATORS**
Almar Elevator Co., 1100 Boston Ave., Bridgeport, CT 06610
McElroy Machine, 1101 Lorraine Rd., Bloom, MI 39535-4454
- EMPLOYMENT**
Bait Crews, 1 Sebe Court, Suite 309, New Orleans, LA 70114
Marine Jobs, Inc., 800 Downtowner Blvd., Ste. 111, Mobile, AL 36609
- ENGINEERING SERVICES / MARINE ENGS**
Kveerner Mass Marine Inc., 201 Defense Highway, Suite 202, Annapolis, MD 21401
NKF Engineering, Inc., 4200 Wilson Blvd., Arlington, VA 22203
Elliot Bay Design Group 5301 Shilohole Ave. N.W. Ste. 200, Seattle, WA 98107
Scientific Marine Services, Inc., 101 State Pl., Suite F, Escondido, CA 92029
- ENGINE LUBRICATION SYSTEMS**
Engine Lubrication Systems, 64 State Rd., Paoli, PA 19301
- ENGINE ROOM LIGHTING/MONITORING & CONTROL SYSTEMS**
Walsau Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearland, TX 77581
Mackay Communications, 2721 Discovery Dr., Raleigh, N.C. 27616-1851
Radio-Holland USA, 8943 Gulf Freeway, Houston, TX 77017
- EVAUATION SYSTEMS**
ISC, 10251 Bridgport Rd., Richmond, BC Canada
- EVAPORATORS**
Alfa Level Separation, Inc., 955 Mearns Rd., Warrimster, PA 18974
Beard Industries Inc., P.O. Box 31115, Shreveport, LA 71130
- EXPANSION JOINTS**
Stlex Inc., 758 Trannere Dr., Mississauga, Ontario L5S1L8
Applegate Industrial, 1440 Government Street, Baton Rouge, LA 70802
- EXPLOSIVELY BONDED METALS**
Northwest Technical Industries, 2249 Diamond Point Rd., Sequim, WA 98382
- FAIRING COMPOUND**
Adtech Marine Systems, 815 W. Shepherd St., Charlotte, MI 48813
Phildelpha Resins, P.O.B. 309, Montgomeryville, PA 18939

FANS - VENTILATORS - BLOWERS

Dry Air Technologies 313 N Oak St, Burlington, WA 98233
Jon M. Liss Associates, Inc., 411 Borel Ave., San Mateo, CA 94402

FASTENERS

Jamestown Distributors, P.O. Box 348, Jamestown, RI 02835
Sunco, P.O. Box 283, Gurnee, IL 60032

FENDERING SYSTEMS/BUOYS - Dock & Vessel

Plastic Plings Inc., 1485 South Willow Ave., Rialto, CA 92376
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

Seward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook, VA 22624

Urethane Products, 17007 South Broadway, Garden, CA 92424

Duramax Marine, 16025 Johnson St., P.O. Box 67, Middlefield, OH 44062-0067

Wing Fender Co., 1160 State St., Perth Amboy, NJ 08861
Ultra Poly, Inc., 2326 South Steele St., Tacoma, WA 98409

Pomar, 115 Industrial Blvd., Keamsville, W. VA 25430
Schuyler Rubber Co., 1801 Woodson Rd., Woodville, WA 98072

Urethane Products Corp., 17007 South Broadway, Garden, CA 92424

FIBERS

Wellington, P.O. Box 244, Madison, GA 30650

FILTERS/FILTER SYSTEMS

Boll Filter, 15 International Dr., East Granby, Ct. 06026
Kraissl Co., 299 Williams Avenue, Hackensack, NJ 07061

Tech Oil Products Inc., 4308 W. Admiral Doyle Dr., New Iberia, LA 70560

Luber-Finer, Inc., 202 South 4th St., Abion, FL 6806-1313
Hamburg 1, GERMANY.

Ralko Ltd. U.S.A. Repe Simplex-Turner Inc., P.O. Box 675, Tonawanda, NY 14151-0675

FIRE & SAFETY PRODUCTS

Nautical Safety Products, P.O. Box 590462, Houston, TX 77259
AGI Shipboard Fire Service Ltd., 561 Wain Rd., Sidney B.C. Canada V8L 5N8

NSSCO, 2040 Harbor Island Dr., Suite 201A, San Diego, CA 92101

Nautical Safety Products, P.O. Box 590462, Houston, TX 77259
Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807

Unitor Ship Service Inc., 2375 West Esther Street, Long Beach, CA 90813

Grimmel Fire Protection, 635 Sharon Drive, Westlake, OH 44145

American Pacific Corp., 3770 Howard Hughes Pkwy, Las Vegas, NV 89102

Grimmel, 635 Sharon Drive, Westlake, OH 44145
Panel Specialists, Inc./Thermax, 3115 Range Rd., Temple, TX 76701

Barbridge, 252 Revere St., Canton, Mass. 02021

FLUID HANDLING EQUIPMENT
Graco, Inc., P.O. Box 1441, Minneapolis, MN 55441

FRESH WATER GENERATOR
Sasaku Engineering, 7-32 Takeshima, 4-chome, Nishiyodogawa, KY 026455, Japan

FUEL CONSERVATION
Instruments Computer & Controls, Inc., 70 South Bow Rd., Hooksett, NH 03103

FUEL DECONTAMINATION
Fuel Dynamics, 707 Mullet Dr. #110, Cape Canaveral, FL 32920
Environmental Solutions Intl., 11032 Racoon Ridge, Reston, VA 20191-4911

GALLEYS EQUIPMENT
Copaiah Refrigerator Co., 940 Industry Rd., Kennel LA 70002
Jamestown Metal Marine Sales, Inc., 4710 Northwest Second Ave., Boca Raton, FL 33431

Ling Manufacturing, P.O. B. 995, Redmond, WA 98073
Marine Accommodations, Inc., 3830 Williamsburg Park Blvd., Building 7, Jacksonville FL 32257

GALVANIZED LADDERS
Nautical Safety Products, P.O. Box 590462, Houston, TX 77259-0462

Siphon Safety Flooring, 2545 Beaufort St., Detroit, MI 48207
Woolser Products Inc., 1000 Spruce St., P.O. Box 896, Wooster, OH 44691

GEARS & GEAR REPAIR
Haley Marine Gears International, Inc., 2600 N. Concord Belle Chasse, LA 70037

Nico Marine Specialists, 29 Louisiana St., West Wingo, LA 70094
The Falk Corp., PO Box 462, Milwaukee, WI 53201-0462

Marine Gears, P.O. Box 669, Greenville, MI 38702
Cincinnati Marine Systems, Inc., P.O. Box 660, West Elizabeth, PA 15088-9660

Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati, OH 45227

GENERATOR
Alaska Diesel, 4420 14th Ave., NW, Seattle, WA 98107
Baylor Co., 500 Industrial Blvd., Sugarland, TX 77478

Insuline Recycling B.V., Deconing 3, 1042 AT Amsterdam, NETHERLANDS

GEARS
International Communications, 813 Diligence Dr. Ste 120, Newport News, VA 23606

Furuno USA, Inc., 271 Harbor Way, S. San Francisco, CA 94090

Radio-Holland USA, 8943 Gulf Freeway, Houston, TX 77017
Sea, Inc., 7039 220th S.W. Mt. Lake Terrace, WA 98043

HEAT EXCHANGERS
Alfa-Laval Separation Inc., 955 Meams Rd., Warminster, PA 18974

Beird Industries Inc., P.O. Box 31115, Shreveport, LA 71130
Computer - A Division of Britannia Heat Transfer, Ltd., 15-20 Colwell Industrial Estate, Station Road, Colwell, Birmingham B45 1JX, UK

Crane Heats, 17 Grandview Ave., West Orange, NJ 07052
Tartler, Inc., 1054 Claussen Rd., Augusta, GA 30907-3215

HEAT TRANSFER FLUID
Parsham Corp., 1050 Cowell Rd., Conshohocken, PA 19428

HIGH TEMPERATURE ELASTOMER
Gears, Tawed & Co., 2075 Detweiler Rd., Kutztville, PA 19443-0305

HOISTS
Holly Heist Corp., P.O. Box 86, St. Clair Shores, MI 48080-0086

HORN/WHISTLES
Alchimie Mig. Co. Ltd., 5478 267th Street, Gloucester Industrial Estate, Langley, B.C. Canada V6W 2S8

Kahlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241
Kokum Sonics, Inc., 933 Industry Rd., Ste105, Kenner, LA 70002

HOSE & FITTINGS
Hydrasearch Co., Chesapeake Bay Business Park, 100 Log Caroe Circle, Stevensville MD 21666

HYDRAULICS
Cunningham Marine Hydraulics Co., 201 Harrison St., Hoboken, NJ 07030

Engine Motor, Inc., 170 Hickory Ave., Harahan, LA 70129
Hamilton Jet, P.O. Box 709, Christchurch, NEW ZEALAND

Offshore Inland, Inc. 3521 Brookside Drive, Mobile, AL 36618
Ultra Hydraulics Limited, Cheltenham Road East, Gloucester, GL2 9QN, ENGLAND

January, 1999

Demaree Inflatables Boats, 410 Oak St., Friendsville, MD 21531
Ocean Technical Services Inc., 1140 Peters Rd., Harvey, LA 70058-1705

HYDRAULIC SYSTEM FLUSHING
Consolidated Fluid Power, 155 Wright Ave., Dartmouth, N.S. Canada B4C 3M1

HYDRAULIC TRAINING
Consolidated Fluid Power, 155 Wright Ave., Dartmouth, N.S. Canada B4C 3M1

INFLATABLES
Ocean Technical Services Inc., 1140 Peters Rd., Harvey, LA 70058-1705

Zodiac of North America, P.O. Box 400, Thompson Creek Road, Stevensville, Spots, MD 21152

INSULATION
Bohm & Voss Light Insulation, Barrels & Ladders GmbH, Norddeutsche 13, 20457 Hamburg GERMANY

Panel Specialists, Inc./Thermax, 3115 Range Rd., Temple, TX 76701

Insulations, Inc., 1101 Edwards Ave., Harahan, LA 70123
Mascoat Products, 3500 E.T.C. Jester, Suite N, Houston, TX 77018

Tacon Inc., P.O. Box 107, Westville, NJ 08020
Superior Energies Inc., P.O. Drawer 386, Groves TX 77819

INTEGRATED MONITORING SYSTEMS
Balsalar, Unit 100, 18 Goswick Place, N. Vancouver, BC Canada

INTERIORS
Custom Ship Interiors, Inc., P.O. Box 882, Solomons, MD 20688

Hopeman Brothers, P.O. Box 820, 435 Essex Ave., Waynesboro, VA 22980

Insulations, Inc., Rt. 5, 12360 Leisure Rd, Baton Rouge, LA 70807

Jamestown Metal Marine Sales, Inc., 4710 NW Second Ave., Boca Raton, FL 33431

Marine Accommodations, Inc., 3830 Williamsburg Park Blvd., Building 7, Jacksonville FL 32257

Marine Services Corp., 3457 Guillard Drive, Hood River, OR 97031

Directions In Design, 1848 Craig Rd., St. Louis, MO 63146
James P. Cole & Associates, 2116 Sherman St., Hollywood, FL 33020

ISOLATORS
Lo-Rez Vibration Control, Ltd., 186 West 8th Ave., Vancouver, B.C. V6Y 1R2, Canada

JET BOWTHRUSTERS
Thrustmaster of Texas, P.O. Box 840189, Houston, TX 77084-0189

JOINER - Waterlight Door - Paneling - Ceiling System - Decking
Al Alpha Int'l., Inc., P.O. Box 498865, Cincinnati, OH 45249

Arco Marine, Inc., 1101 Edwards Ave., Jefferson, LA 70101
CustomShip Interiors, Inc., P.O. Box 882, Solomons MD 20688

Hopeman Brothers, Inc., P.O. Box 820, Waynesboro, VA 22980

Insulations, Inc., 1101 Edwards Ave., Harahan, LA 70123
Marine Accommodations, Inc., 3830 Williamsburg Park Blvd., Building 7, Jacksonville FL 32257

Marine Services Corp., 3457 Guillard Drive, Hood River, OR 97031

Panel Specialists, Inc./Thermax, 3115 Range Rd., Temple, TX 76701

Walz & Krenzer, 91 Wilenbrook Rd., Unit B4, Oxford CT 06478
WY 06251

KEEL COOLERS
R.W. Femstrom & Co., 1716 Eleventh Ave., Menominee, MI 49858

Kahlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241
Duramax Marine, 16025 Johnson St., P.O. Box 67, Middlefield, OH 44062-0067

The Walter Machine Co., Inc., 84-98 Cambridge Avenue, Jersey City, NJ 07307

LASER ALIGNMENT
Balsalar Industrial & Consulting Services, P.O. 91360, Mobile, AL 36691

LIFEBOATS/DRAFTS
American Eagle Mfg. Inc., 780 Pearle Jensen Way, LaConner, WA 98257

Avon Marine, 11215 Young River Ave., Fountain Valley, CA 92708
DCC Marine Safety Systems, 12351 Bridgeport Rd., Richmond, B.C. CANADA V6V1L4

Norsafe AS, P.O. Box 115, N-4818 Faenik, Norway
Edgewater Machine & Fabricators, P.O. Box 358, Edgewater, FL 32124-0358

Viking Life Saving Equipment, 1625 N. Miami Ave., Miami, FL 33158

Willard Marine Co., Inc., 1250 N. Grove St., Anaheim, CA 92806
Zodiac of North America, P.O. Box 400, Stevensville, MD 21666

LIFESAIVING EQUIPMENT
MGI International, 119-225 West 1st St., North Vancouver, B.C. CANADA

Streams Manufacturing, P.O. Box 1498, St. Cloud, MN 56302

LIFT EQUIPMENT
JLG Industries, Inc., JLG Drive, McConnellsburg, PA 17233-9533

LIGHTING SYSTEMS / EQUIPMENT
ACR Electronics, Inc., 5757 Ravenswood Rd., Ft. Lauderdale, FL 33310-5247

Archway Marine, 4501 Swan Ave., St. Louis, MO 63110
Gollen Marine, 160 Van Brunt St., Brooklyn, NY 11211

Kokum Sonics, Inc., 933 Industry Rd., Ste105, Kenner, LA 70002
Paulson Electric Mfg. Co., Inc., P.O. Box 53, Piqueland, TX 77968

Francis Searchlights/Stam Supply Co., 4415 8th N.W., Seattle, WA 98107

LINE & NET CUTTER SYSTEMS
Spurs Marine, 201 S.W. 33rd Street, Ft. Lauderdale, FL 33315

LIQUID OVERFILL PROTECTION SYSTEMS
E.F.L. Marine Products, P.O. Box 1001, New Albany, IN 47151

King Engineering Corp., P.O. Box 1228, Ann Arbor, MI 48106
Gems Sensors, Inc., 1 Cowles Rd., Plainville, CT, 06062

LOGISTICS
V.L. Logistics Consultants, Inc., 3420 Bienville Blvd., Ocean Springs, MS 39564

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
Lake Shore Inc., P.O. Box 809, Iron Mountain, MI 49801, 1150

Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11211
Mackay Communications, 2721 Discovery Dr., Raleigh, N.C. 27604-1851

CT Marine, 58 Crooked Trail, Rowayton, CT 06853
Crandall Dry Dock Engrs., Inc., P.O. Box 505804, Chelsea, MA 02150

MANAGEMENT SYSTEMS & SERVICE
Crane Consultants, 15301 First Ave S., Seattle WA 98148

C.R. Cushing, 18 Vesey St., New York, NY 10007
CT Marine, 58 Crooked Trail, Rowayton, CT 06853

Cunningham & Walker, 1762 Providence Hollow Lane, Jacksonville, FL 32223

Frank L. Darden, 3000 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

Designs & Planners, 2120 Washington Blvd. Ste.200, Arlington, VA 22204

Eron Mgmt.& Engineering Consultant Services, P.O. Box 7790, Beaumont, TX 77705

GIM Inc. (Int. Measurement Consultants), P.O. Box 1836, Newport News, VA 23601

Gibbs & Cox, Inc., 50 West 23rd St., New York, NY 10010

Resolution Management, 11 Eves Drive Suite 140, Marlton, NJ 08053

Hornblower Marine, Pier 3 Ferryboat Santa Rosa, San Francisco, CA 94111

Boards Industrial & Consulting Services, P.O. B. 91360, Mobile, AL 36691

Kvaerner Masa Marine, 201 Defense Hwy., Annapolis, MD 21401

MARINE DECKING
E.H. O'Neill Co., 1405 Chippendale Rd., Lutherville, MD 21093

Hopeman Brothers, Inc., P.O. Box 820, Waynesboro, VA 22980

Insulations, Inc., Rt. 5, 12360 Leisure Road, Baton Rouge, LA 70807

Selby, P.O. Box 1600, Sapulpa, OK 74067

Boatse Docking 2708 N. Australan Ave. Ste. 9, West Palm Beach, FL 33407

Siphon Safety Flooring, 2545 Beaufort St., Detroit, MI 48207

MARINE DRILLING & BLASTING
Marine Drilling & Blasting, Inc., P.O. Box 18098, Beverly Hills, CA 90229-4098

MARINE ELECTRONICS
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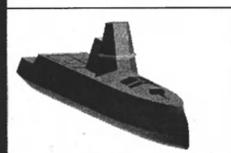
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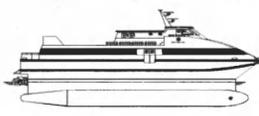
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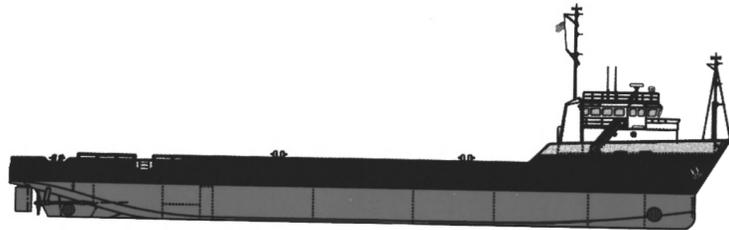
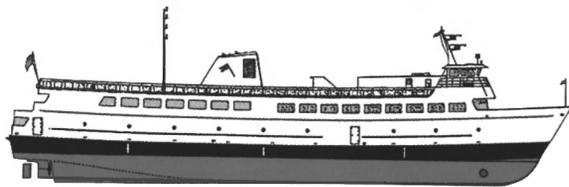
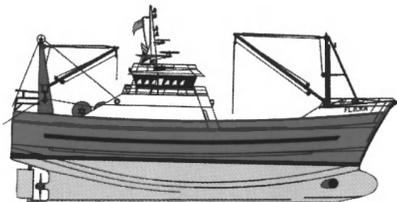
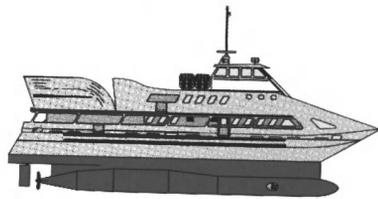
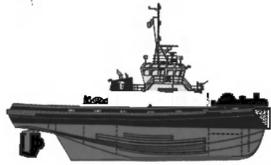
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