

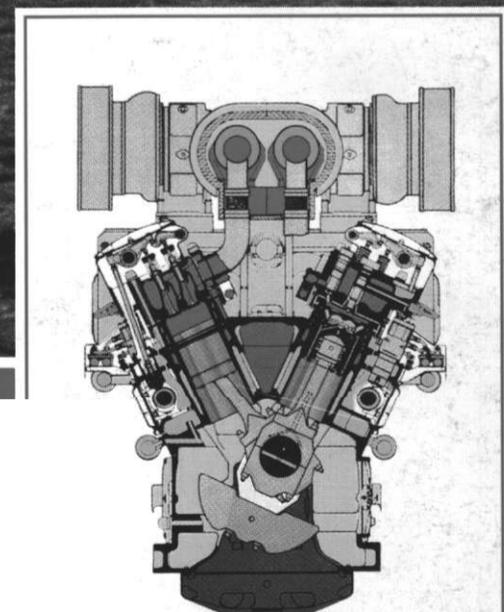
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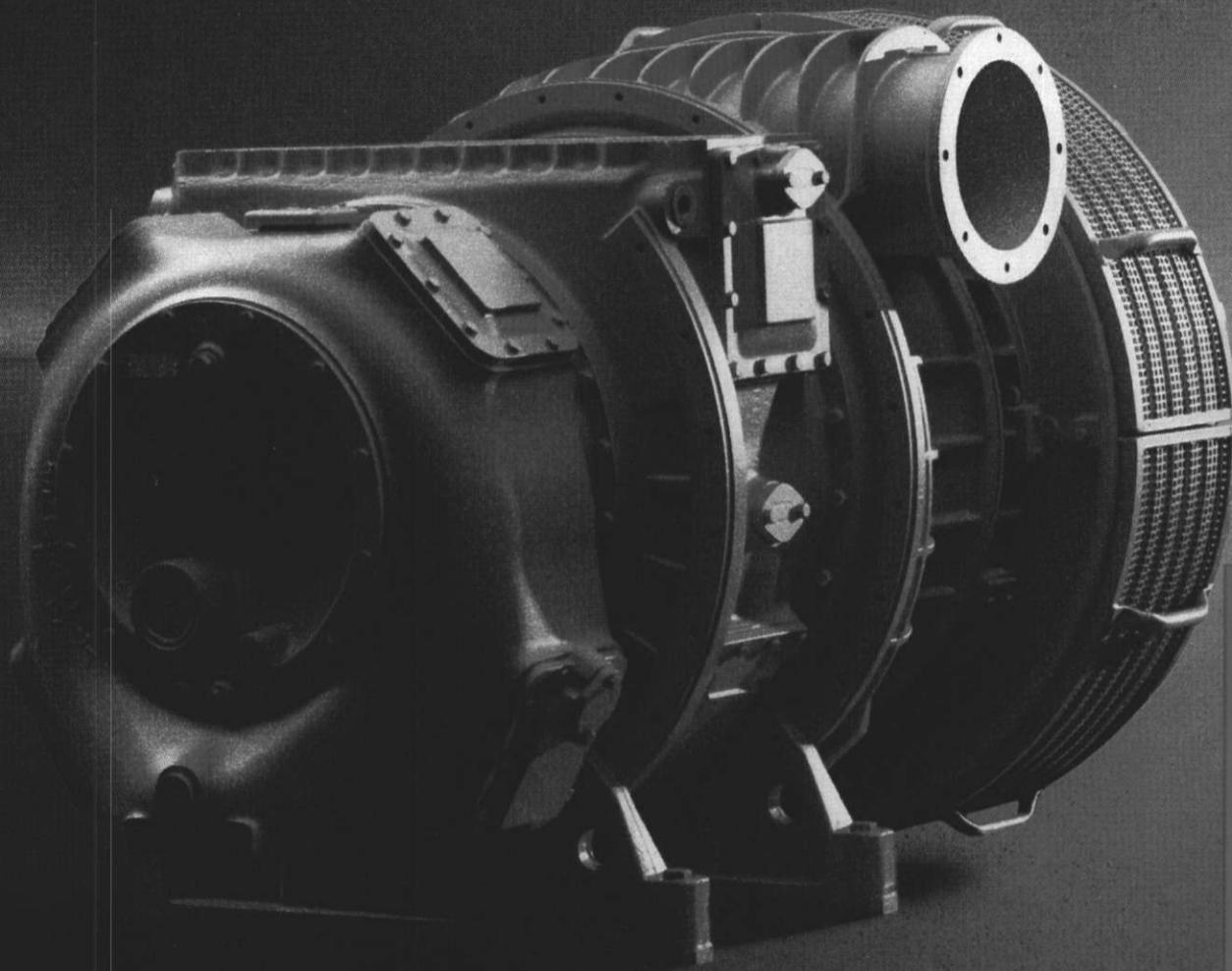
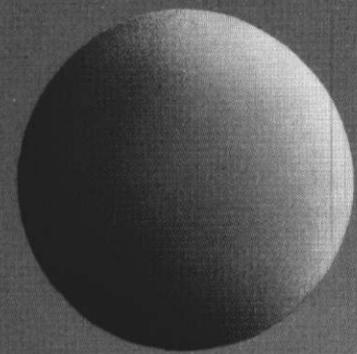
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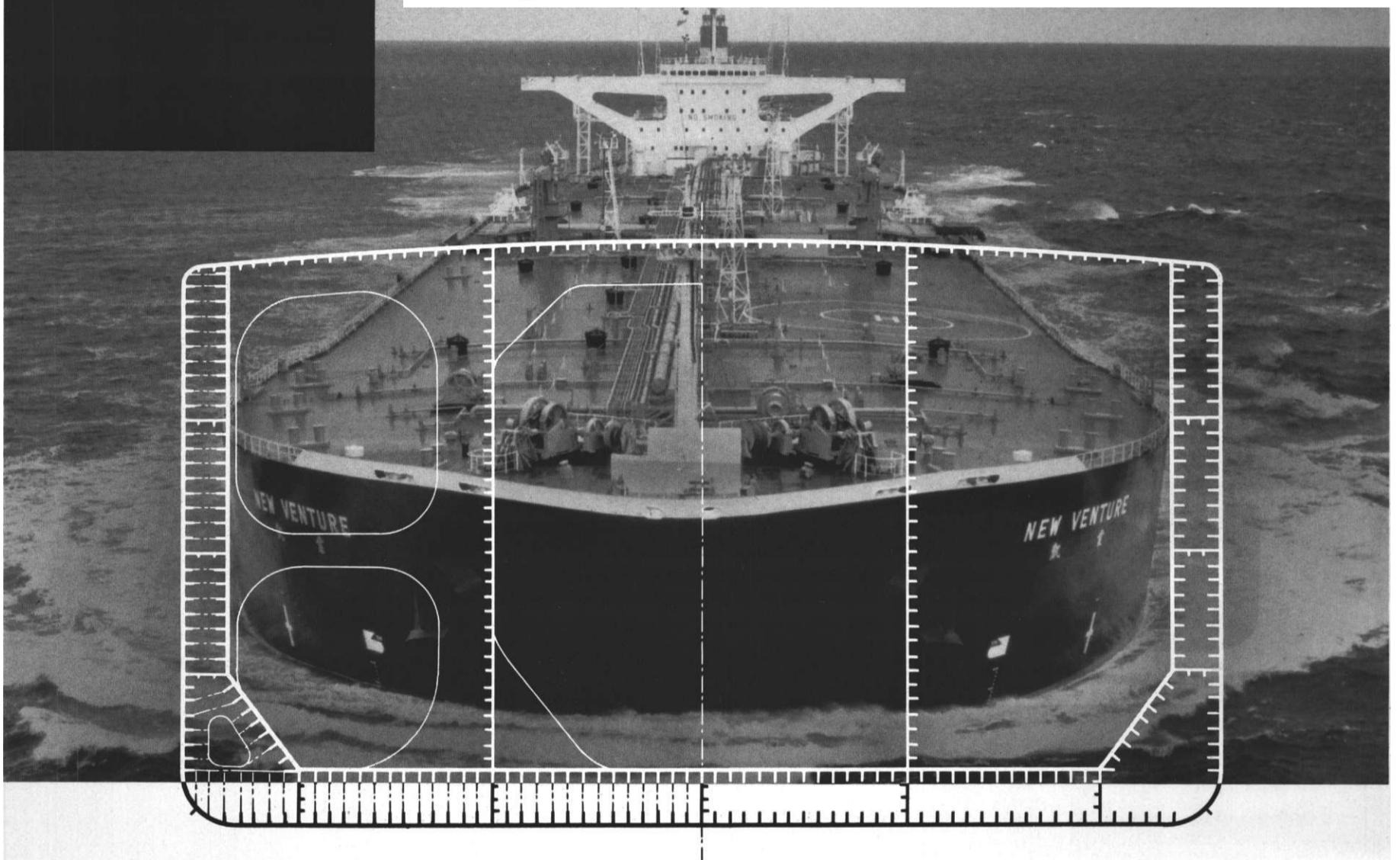
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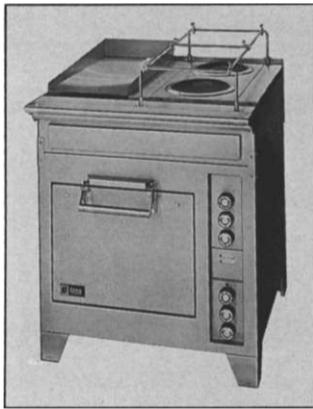
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The twin-hulled SSC Radisson Diamond, recently delivered by Finnyards Oy of Finland, may be the first of several SWATH vessels to join the world cruise shipping fleet. For details on the Radisson Diamond, see page 66. **Inset photo:** Cross sectional drawing of the Sulzer ZA40S medium-speed diesel, which will be marketed and built in the U.S. by Westinghouse. See "Inside Diesel Power," page 21 for details.

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Secondhand Ships: Market Prospects During the 1990s 61

\$3.3 Million In Contract To Continental Maritime

The San Diego shipyard of Continental Maritime was recently awarded Navy repair contracts worth over \$3.3 million. Under the separate contracts, Continental Maritime will repair the cruiser USS Halsey (CG-23) and the destroyer USS Chandler (DDG-996).

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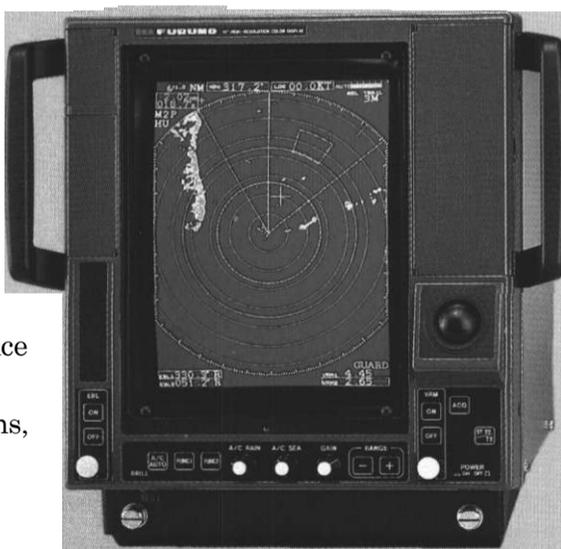
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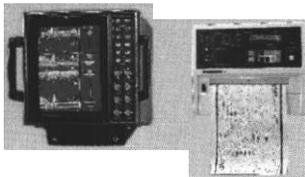
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Finnyards Close To \$40 Million Ferry Deal

Finnyards, of Rauma, Finland, has received a letter of intent from the Danish shipowner A/S Progress for the construction of a \$40 million high speed ferry.

Likely to soon become a firm order, the proposed new diesel-powered monohull design will be ca-

pable of carrying 700 passengers and 600 cars at a speed of approximately 30 knots.

Progress intends to use the ferry on its service between Mandal, Norway, and Hanstholm, Denmark. Once the letter of intent becomes a firm order, Finnyards has stated that the vessel could be delivered by spring 1994.

Subic Bay Conversion To Commercial Port Would Cost \$300 To \$500 Million

A plan to finance a conversion of the U.S. naval base at Subic Bay, Philippines, to a commercial port has been agreed to in principal by the World Bank.

Being centrally located in South-

east Asia, the deep water natural harbor of Subic Bay is considered to be a prime regional ship repair and commercial port area.

An estimated \$450,000 in initial technical assistance would be granted by the World Bank, according to Mr. **Rogelio Singson**, executive director of the Coordinating Council on the Philippine Assistance Program, with several million dollars of additional soft loans being made available once the plan is completed. It has been estimated by project analysts that the final financing package could be worth from \$300 million to \$500 million.

Significant investors in the project include: Keppel Corp., of Singapore; Hong Kong's Hopewell Holdings Ltd.; and Kawasaki Heavy Industries Ltd., of Japan.

Galveston To Link U.S. And Mexico In New Joint Rail/Barge Venture

Mexico City-based Protexa Burlington International SA de CV (PBI), a new joint venture between the U.S. railway operator Burlington Northern (BN), Inc., and Grupo Protexa SA de CV, a Mexican construction and marine services firm in Monterrey, recently made an exclusive agreement with the Port of Galveston that establishes the port as the U.S. connection in a planned rail-barge trade link with Mexico.

Galveston was chosen by BN officials to be the rail-barge project's port because of its proximity to open water, a factor that will reduce transit time, and easy rail access.

Under the agreement BN trains will connect at the port with Protexa rail barges bound for the eastern Mexico ports of Altamira, Veracruz and Coatzacoalcos. From there, Mexico's national railway systems, Ferrocarriles Nacionales de Mexico will distribute the cars inland.

In the early stages of the project, two PBI barges carrying 54 railcars each will make the run weekly, with the average Gulf transit time being 3-1/2 to 4 days. While the initial cargoes will be grain, PBI foresees automobiles, auto parts, chemicals and consumer goods soon following.

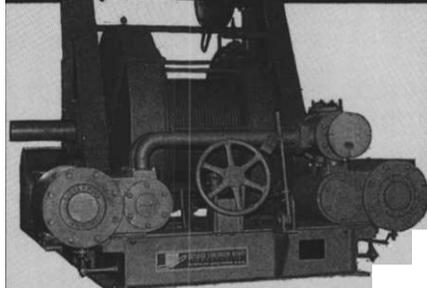
Danish Merchant Fleet Undergoes Major Expansion

New ship deliveries and the return of several vessels to Denmark's international ship register expanded the size of the Danish-flag merchant fleet by 43 vessels last year to 603 ships of 7.9 million dwt, according to the Danish Shipowners Association.

Tankers accounted for more than half of the fleet, with another 30 percent employed in the container and ferry trade. Denmark operates the world's 6th largest container fleet.

Denmark's shipyards have almost 100 ships worth \$3.2 billion on order from Danish shipowners.

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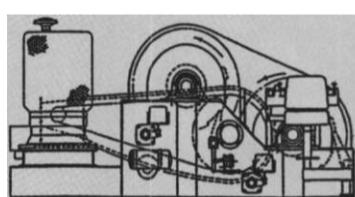


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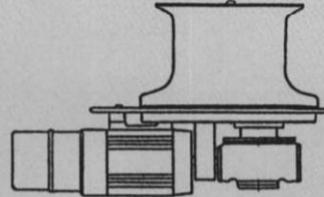
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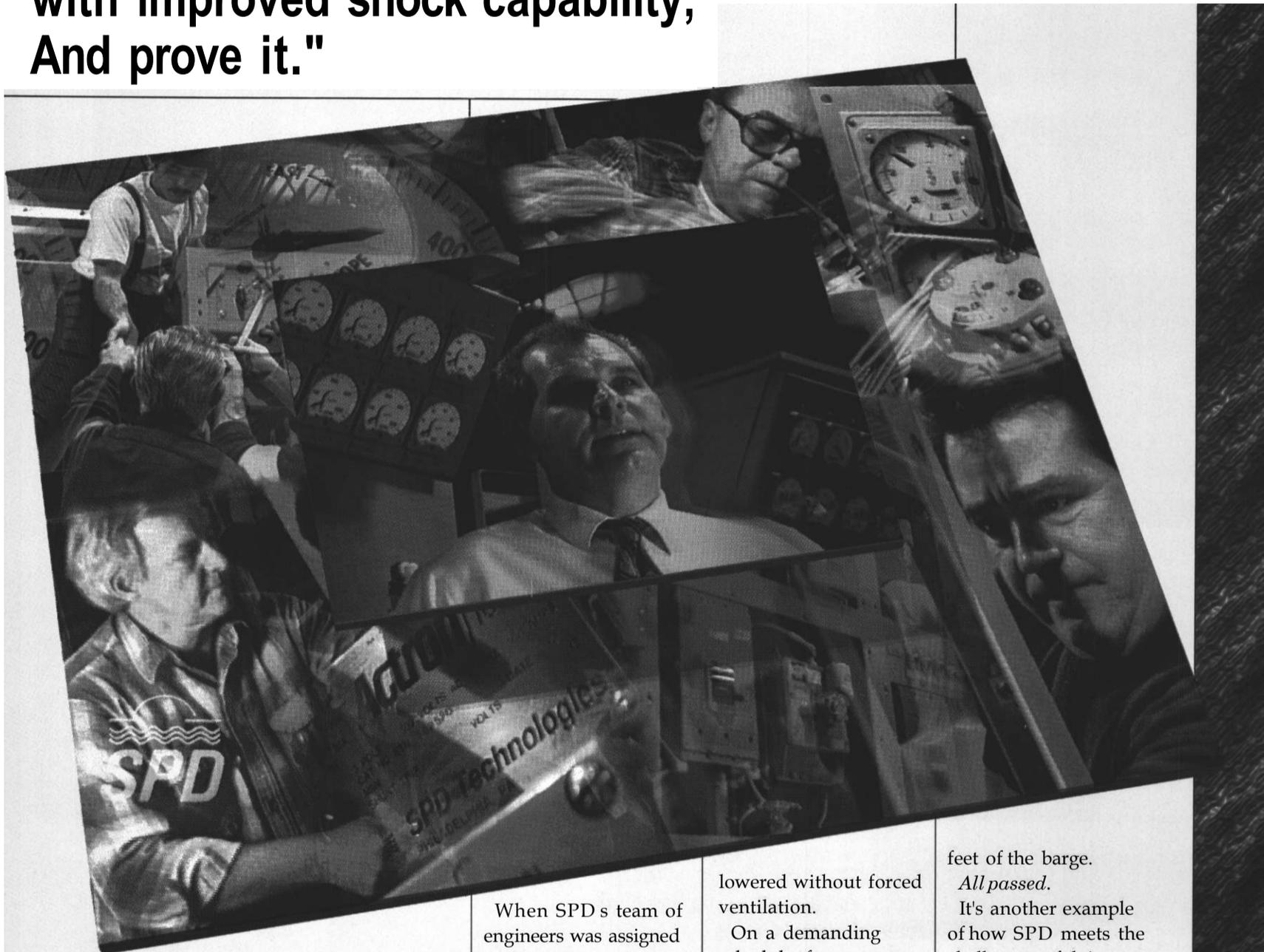
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*Zinc level less than 10 ppm

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Electronics Update

Siemens Division Supplies Integrated Electric Propulsion System For B.C. Ferry

The Quebec-based Industrial Systems Division of Siemens Electric Ltd. has supplied an integrated electric propulsion system (see Figure 1) for the newest British Columbia car ferry. Already in service, the 85-vehicle, 300-passenger MIV Queen of Capilano is the first of two such ferries for operation between Earl's Cove and Saltery Bay in British Columbia.

The electrical power at 4.16 kv is generated by three brushless 1,700-kw generators driven by Bergen Diesels.

The MS21 medium voltage switchboard, which includes nine sections, distributes this energy to the propulsion motors and ship's service transformers. The three generator sections are provided with vacuum circuit breakers and the four propulsion motor sections and two transformer sections include vacuum contactors.

Each of the ship's four Z-drive propellers are driven by Siemens 900-kw propulsion motors. Siemens has provided ship's service transformers which supply the ship at 480 v.

All the control and protection equipment is located in the control and protection switchboard RS21. This switchboard includes 6 Siemens' SIMATIC PLCs to control

diesels and generators, 15 micro-computer-based control and protection devices and various instrumentation. All these controls are implemented in the power management system which provides control of the propulsion system.

The main machinery is checked by an alarm and monitoring system, SIMOS 32C, collecting the signals from 450 different sensors.

The output of the system is connected to the two VDUs for alarms, one VDU for graphics and two printers, one for alarms and the other for data logging.

Siemens supplied a PC-based Health Monitoring System used as the main tool for an optimal maintenance of the ship's main machinery.

At the same time, the fuel monitoring system permits the ship's crew to optimize the fuel oil consumption.

The second ferry of the series is being commissioned by Siemens engineers at Vancouver Shipyards. In addition, a Jumbo Class 470 car ferry under construction for B.C. Ferries will be fitted with a complete Siemens electrical and automated control system.

For free literature detailing the Industrial Systems Division of Siemens Electric,

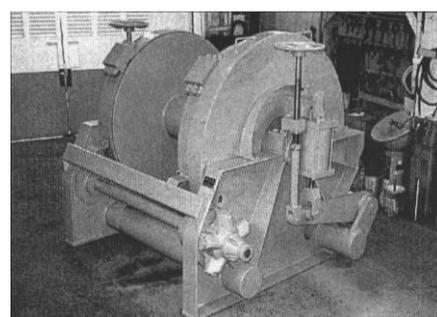
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Markey Machinery Supplies Hawser Winch For LOOP Emergency Response Vessel

A Markey Machinery Co., Inc., type DUSS-71 single drum hawser winch was provided to Edison Chouest Offshore, Inc., recently for service aboard a new emergency response vessel built at North American Shipbuilding and owned by L.O.O.P. Offshore, Inc.

This single drum winch design has a capacity of 700 feet of 14-inch circumference synthetic line, and uses a two-speed hydraulic motor configuration to achieve line pulls up to 25,000 pounds with speeds of 0 to 200 feet per minute.

To accommodate the large braking capacity requested by the customer, two self-energizing band-type brakes were used to produce a total capacity of 500,000 pounds. Brake air cylinders are integrated with the winch controls for automatic operation of each brake, and



Type DUSS-71 Hawser Winch, S/N 15652, from Markey Machinery Co., Inc.

handwheels are provided for auxiliary manual brake engagement.

"Built for Strength and Durability," according to Markey, a tubular winch frame reduces the overall weight of the machine, and facilitates winch maintenance with its

open design. Self-lubricating plastics, wear resistant materials, and heavy rolled stainless steel brake drums are used to keep maintenance to a minimum, while enhancing the reliability of the winch.

On-call 24 hours a day, the L.O.O.P. ERV must rely on this machine to perform at any moment, in all types of operating conditions.

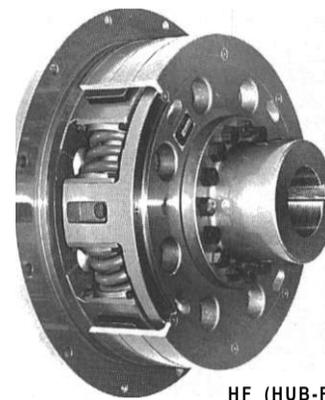
Markey Machinery Company, Inc., Seattle, has been supplying deck machinery for over 80 years.

For free literature detailing the deck machinery offered by Markey Machinery,

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STEEL-SPRING FLEXIBLE COUPLINGS

LO-REZ



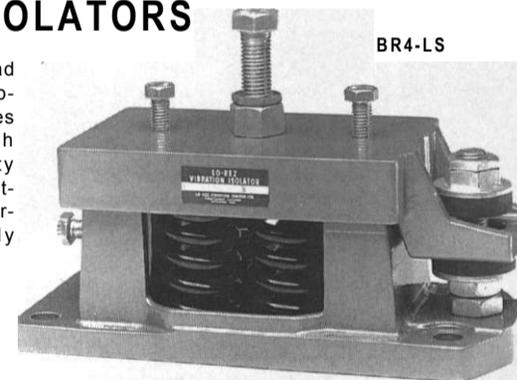
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LO-REZ helical steel-spring couplings, with their low, constant and accurately-controlled torsional stiffness factors, provide excellent torsional characteristics for geared marine reciprocating propulsion systems, engine and reciprocating compressor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

LO-REZ was one of the first coupling manufacturers, 40 years ago, to recognize the importance of torsionally-soft couplings in power transmission systems, particularly in reciprocating, variable speed systems and those involving gearing.

STEEL-SPRING VIBRATION ISOLATORS

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



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

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LO-REZ manufactures both the conventional untuned viscous dampers and its new patented mechanically-tuned viscous dampers. Extensive research has shown that the single and compound tuning methods, as developed by LO-REZ, reduce resonant amplitudes by some 40% and 60%, respectively, of the untuned values.

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\$75 Million Cable Ship Launched By AT&T/ Teleglobe At FELS

AT&T and Teleglobe of Canada recently announced the launching of a \$75 million cable ship, the Global Mariner, which is jointly owned

by the two companies through a limited partnership between their respective subsidiary companies, Teleglobe Marine, Inc., and Transoceanic Cable Ship Co.

The ship's interior is being fitted out at the Far East Levingston (FELS) shipyard in Singapore, with sea trials scheduled for this fall.

With the addition of the new cable ship, AT&T now operates five cable

ships for the AT&T/Teleglobe partnerships. Two of the vessels, the C.S. Global Sentinel and the C.S. Global Link were also built by FELS shipyard in 1990 and 1991.

For additional information about the services and facilities available from Far East Levingston's shipyard,

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Gerhard Kurz Elected Chairman Of Ocimf

The president of Mobil Shipping and Transportation, **Gerhard Kurz**, was recently elected as chairman of the Oil Companies International Marine Forum (Ocimf). The Ocimf represents the oil industry and independent tanker owners, particularly in matters of marine safety. He succeeds **Douglas Wolcott**, of Chevron, who has been the organization's chairman since 1989.

Mr. Kurz- became Mobil Shipping's president in 1988, after first joining the company in 1964. His responsibilities extend over 40 tankers and 53 tugs and barges.

Dutch Launch One Of World's Largest Dredges

Reported to be the world's largest trailing suction hopper dredger, the 17,300-dwt J.F.J. De Nul, was recently launched from the Merwede Shipyard, in Hardinxveld-Giessendam, Netherlands. She is scheduled to be commissioned in August by her owning company Jan De Nul, of Aalst, Belgium.

A substantial amount of the dredge's \$55.6 million construction contract was subsidized by the Dutch and Belgian governments.

The J.F.J. De Nul's 415,000 cubic feet hopper capacity brings major economies of scale to dredging, reclamation, offshore trenching and backfilling tasks. As a cargo dredger, the vessel will be capable of reaching sand and gravel at depths approaching 250 feet, reportedly far beyond the range of contemporary dredges.

The vessel's twin MAN B&W L48/60 diesel engines generate 16,800 bhp and powers the ship at 15 knots. Two 12,000-bhp dredging pumps are also onboard. In deep water, the dredge utilizes a Simrad Albatross dynamic positioning system and twin 880-hp bowthrusters fitted in the foreship section.

Kawasaki Receives \$55 Million Order For Bulker From K Line

Tokyo-based Kawasaki Kisen Kaisha (K-Line) has recently placed a \$55 million order with Kawasaki Heavy Industries for a 150,000-dwt pure bulk ship.

The keel is scheduled to be laid in June 1993 and completed at the end of February 1994. The vessel has already been committed to operation with K-Line under a long term charter contract with Kawasaki Steel for the Japanese iron ore import market.

The new bulker will be used as a replacement for the Liberian-flag, 116,000-dwt ore/coal carrier Brockman, which is managed by Kobe Kisen Kaisha.

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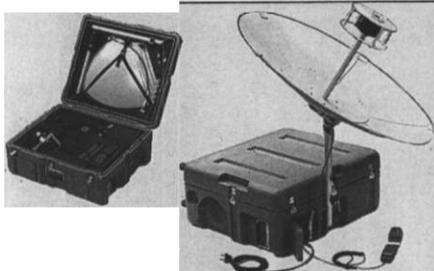
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New Maritime Policy Proposed

U.S. Owners Could Place \$5 Billion In New Ship Orders

In mid-June, Secretary of Transportation **Andrew H. Card Jr.** outlined a major initiative to revitalize U.S. shipping. In explaining the proposed policy, Secretary **Card** said that the changes will "set a new course for America's merchant marine, one which will enhance its competitiveness and improve its viability into the 21st century."

Of particular relevance is the proposal to allow use of Capital Construction Funds (CCF) to build ships outside the U.S. The CCF program was established in 1970 to enable U.S. shipowners to accumulate tax deferred funds for building or reconstructing ships. A condition of the program was that the fund could only be used to build ships in U.S. shipyards. Under the new proposed policy, the 92 companies who participate in the CCF program will be freed to use the \$1.2 billion now accumulated to build ships in a country or nation of their choice. These funds provide equity which could produce a flow of shipbuilding orders totaling as much as \$5 billion.

Other proposed changes include allowing foreign-built ships to carry preference cargo immediately upon registry in the U.S., loosening citizenship requirements on U.S.-flag vessels and initiating actions designed to improve the competitiveness of U.S. shipyards.

The new **Bush** Administration maritime policy also includes a system of payments to U.S.-flag ship operators to keep ships under the American flag and make them available in times of war or national emergency.

The policy changes were influenced by the need for reliable sealift capability pointed out by Operations Desert Shield/Storm, the decline of the U.S.-flag merchant fleet and recent announcements by two of the largest U.S.-flag operators, APL and Sea-Land, that they would withdraw their vessels from U.S.-flag status beginning in 1995 unless reforms were implemented to assist U.S.-flag operators' competitiveness.

Secretary **Card** noted the program of contingency retainer payments to ship operators was needed because the other initiatives and reforms could not overcome the advantages of operating ships under foreign flags. Lower foreign wages in combination with foreign subsi-

dies contribute to the problem, said Secretary **Card**.

To counter the prospect of a significantly diminished U.S. liner presence in the foreign trade, up to 74 liner ships could receive payment over a seven-year period beginning in 1994. The payment would be \$2.5 million per ship for each of the first two years, phased down to \$1.6 million per ship in the final year.

The program would differ significantly from the current operating differential subsidy (ODS) program, which will be allowed to expire. Unlike ODS, the new program, for example, will allow operators to acquire vessels worldwide, operate them anywhere in the foreign trade and in conjunction with foreign-flag feeder vessels. Operators will be free to compete efficiently and flexibly for international cargoes.

Besides the system of contingency retainer payments, the program contains other legislative, regulatory, and administrative initiatives designed to help U.S.-flag ship operators and American shipbuilders compete more effectively in the world marketplace. Some of the points include:

- Support the use of the federal ship financing fund (Title XI) to help finance shipbuilding in American yards;

- Initiate a research and development program and an export promotion program for U.S. shipyards;
- Prevent foreign shipyards that receive excessive subsidies from benefiting from the new U.S. maritime policy;

- Support for the Jones Act and enforcement of current cargo preference laws;

- Encourage investment in U.S.-flag ships by relaxing citizenship ownership requirements and regulations affecting the changing of registries;

- Elimination of foreign government subsidies to foreign shipyards through bilateral negotiations and an expedited section 301 action and a GATT action under the subsidies code;

- Reduction and eventual elimination of the 50 percent ad valorem tax operators must pay on ship repairs in foreign yards.

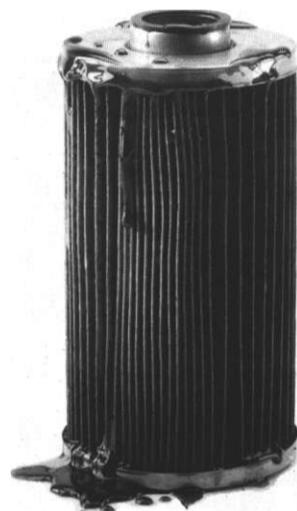
Congressional approval is still required for the new maritime policy—and the debate in Congress will be heated.

NKK Forms New Joint Agreement With Small-Ship Firm

A new working arrangement that is expected to boost profitability and further consolidate the Japanese shipbuilding industry has been an-

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According to an NKK statement, the agreement with Tsuneishi will cover the range of marketing, design, materials procurement, construction and repair of shipments.



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Stolt-Nielsen Adds Two Inland Tankers; Acquires Comex Services

Purchase Forms World's Largest Subsea Contracting Group
For Oil & Gas Industries

The third and fourth in a series of five 2,100-dwt stainless steel chemical tanker for the transport of bulk liquids along the Rhine River and its tributaries have been delivered to Stolt Stinnes. Stolt Stinnes, headquartered in Duisburg, Germany, is a new tanker service formed by international bulk liquid transportation company Stolt Tankers and Terminals (Holdings) S.A. and Stinnes Reederei AG, one of the largest operators of inland tankers in Western Europe.

Designed by Stolt-Nielsen, these new ships, the M/T Stolt Mosel and M/T Stolt Neckar, will join two Stolt, the Stolt Main and Stolt Maas, and four Stinnes vessels already in service, for a total of eight. One more inland tanker from each owner will enter service by early 1993.

The Stolt Mosel was built by Bayerische Schiffbau GmbH shipyard in Erlenbach, Germany, while the Stolt Neckar was delivered by the Scheepsweg Grave B.V. ship-

yard in Grave, Holland.

The 282-foot, Caterpillar-powered double-hull tankers have stainless steel cargo tanks, each served by an individual deepwell pump. Eight cargo tanks provide a capacity of 2,080 m³ at 100 percent tankage. The design for this series has many of the features usually found on much larger parcel tankers, providing maximum safety and environmental protection. For example, besides their double hulls, the tankers have: insulated cargo/stripping/vapor lines with electric heat tracing; separate stripping pumps, with discharge lines to the manifold, minimizing cargo residues; an integral absorption filter, installed to minimize emission of hazardous gases during loading; and stainless steel slop tanks.

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A.P. Moller selected CHOCKFAST ORANGE® to protect their investment in the world's largest marine engine on the Majestic Maersk, a super container ship, constructed at the Odense Steel Shipyard Ltd.

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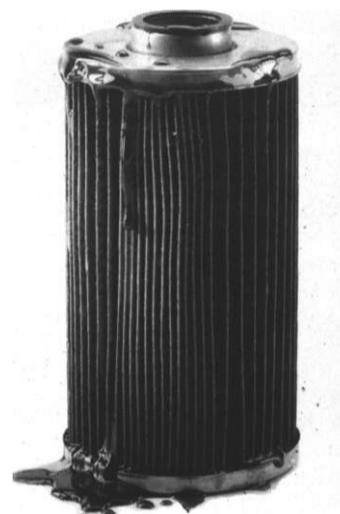
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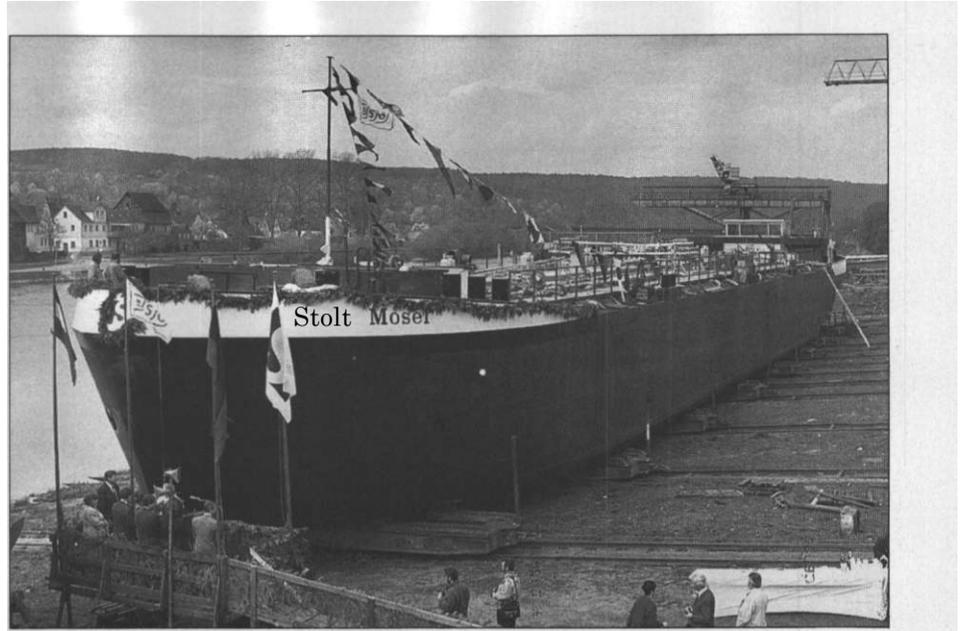
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The larger your investment, the greater your need for unsurpassed reliability,

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New Oceanographic Ship Christened By MSC At Avondale

The oceanographic research ship USNS Waters (T-AGS 45) was recently christened by the U.S. Navy's Military Sealift Command (MSC) at Avondale Industries, Inc., New Orleans, La.



MSC's new oceanographic ship USNS Waters is christened at Avondale Industries.

The principal speaker at the ceremony was MSC's commanding officer, Vice Adm. **Francis R. Donovan**, USN, and the ship was sponsored by: **Carol Weir Waters, Martha Waters Philipps, Ann Waters Scott and Dabney Waters Schmitt**, all daughters of the ship's namesake, Rear Adm. **Odale D. Waters Jr.** Admiral Waters organized the Navy's oceanographic efforts into one centralized command while Oceanographer of the Navy between 1965 and 1970.

Upon delivery the Waters will join MSC's 20-ship Special Mission Support Force and will conduct acoustic, hydrographic and oceanographic surveys and other scientific and experimental operations under the direction of the Space and Naval Warfare Systems Command.

The Waters has a length of 442 feet, a beam of 69 feet and a 21-foot draft when fully loaded. She is ice strengthened and powered by two electro-propulsion motors that give her a sustained speed of 13.2 knots. The ship will carry a crew of 57 civilian mariners, 21 scientists and a six-man military communication detachment.

For free literature about the services available from Avondale Industries, Inc.,

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Shaver Awards Z-Drive Tug Contract To Martinac

J. M. Martinac Shipbuilding Corporation, Tacoma, Wash., recently received a contract to build a 3,000-hp, twin-screw, Z-drive tug from Portland, Ore.-based Shaver Transportation Company.

The new tug is a variation on the successful Z-30, two-man tug design from the naval architecture firm of Robert Allan Ltd., Vancouver, Canada. The design firm will also serve as the owner's project man-

ager until vessel delivery in spring 1993.

The tug is 75 feet, 11 inches long with a beam of 28 feet and a maximum depth of 12 feet. Its configuration is of the reverse-tractor type, with fully-azimuthing Niigata ZP-2A drive units located aft. Propulsion is supplied by two Detroit Diesel 16V-149TI-DDEC diesel engines, each rated at 1,500 bhp at 1,700 rpm, marking the first installation

of the new electronically controlled DDEC engine type in a ship assist tug.

The Z-30 will work ships off the bow using a heavy duty electric line handling winch. An articulated extending-boom crane will increase the speed and safety of the ship assist operation by raising the 10-inch hawser approximately 55 feet to the ship's deck.

The tug is also equipped with four

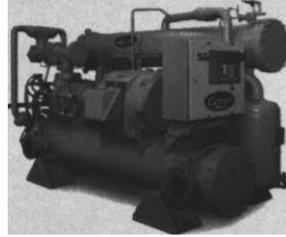
electric winches, mounted fore and aft on the main deck.

For additional information about J.M. Martinac Shipbuilding,

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For free literature about the Z-30 tug design from Robert Allan, Ltd.,

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Boats & Barges



The Caterpillar-powered Empress is the fourth casino boat built by the Jacksonville, Fla., shipyard of Atlantic Marine, Inc.

Atlantic Marine Delivers 1,200-Passenger 'Empress/ New Illinois Casino Boat

Atlantic Marine, Inc., Jacksonville, Fla., recently delivered the Empress to Des Plaines River Entertainment Corporation, Joliet, Ill. The 222-by-66-foot twin deck casino vessel, with a capacity for 1,200 passengers and 100 crew, will offer gam-

ing cruises on the Des Plaines River.

Designed by Rodney E. Lay Associates, Inc., Jacksonville, the vessel is powered by two Caterpillar 3412 TA marine engines turning ZF BW251 reduction gears with a 4.13:1 ratio. Caterpillar also supplied the

following machinery: two 3508, 715-kw generator sets, which provide shipboard electrical service; a 3304NA, 113-kw generator set for emergency power; and a 3208TA engine to power the Schottel SST170 48-inch bow thruster.

Its impressive Las Vegas-style interiors were designed by Directions in Design of St. Louis. The two grand ballroom-sized casinos are located on the upper and main decks. Deck access is provided by a 27-person Montgomery hydraulic elevator.

Electronic equipment on the vessel includes a Furuno 1730 radar, a Datamarine International 300 depth sounder, and VHF radios from Icom and Si-tex.

In addition to the Empress, Atlantic Marine has delivered three other casino boats. Two, the Diamond Lady and Emerald Lady, formerly operated out of Iowa, while a third, the Par-A-Dice, operates out of Illinois. The Diamond Lady and the Emerald Lady will reportedly be moved to Biloxi, Miss., shortly.

Established in 1964, Atlantic Marine constructs all types of vessels including dinner boats, ferry boats, research vessels, tugs, barges and fishing vessels for domestic and international owners.

On the international side, Atlantic is building a steel hull twin-screw passenger/vehicle ferry for the Resort Hotel Playa Tambor. The 130-foot ferry Tambor, scheduled for

delivery in September 1992, will operate between Puntarenas and Paquera on the Pacific Coast of Costa Rica. The Caterpillar-powered vessel will have a capacity of 375 people and between 16 to 18 cars and six trucks or buses.

For free literature detailing the boatbuilding capabilities of Atlantic Marine,

Circle 60 on Reader Service Card

Australian Shipbuilders Predict Sales To Double

John Farrell, head of the Australian Shipbuilding Association, recently stated that sales by Australian shipbuilders could double to more than \$500 million a year by 1995.

The Australian shipbuilding industry will produce \$267 million worth of new ships by the end of fiscal year 1992, 70 percent of which are sold overseas.

While its shipbuilding industry was dominated by the steel construction of coastal traders, trawlers and tugs in 1985, 75 percent of the production in Australia's yards today are built from lightweight materials, including aluminum, used in constructing fast vessels such as catamarans.

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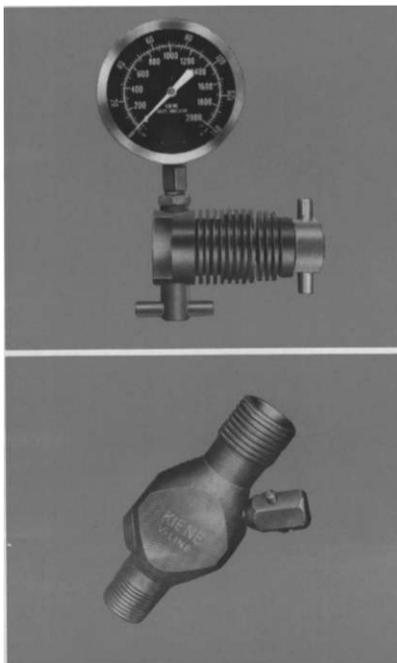
Indicator valves
provide direct access
to engine cylinders

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U.S.-FLAG CRUISING: READY TO SAIL?

New Gaming Law First Step In Opening Lucrative Market To U.S. Operators

By Lawrence H. Evans

Director— Domestic Affairs Transportation Institute*

***Editor's Note:** The Transportation Institute is a maritime trade association based in the Washington, D. C. area which represents more than 140 U.S.-flag shipping companies engaged in the nation's foreign and domestic waterborne commerce. Among the institute's members are American Hawaii Cruises, operating the only two deep-draft U.S.-flag cruise ships, and Delta Queen Steamboat company, which operates on the nation's inland rivers.

Interest among the institute's member companies in U.S.-flag cruise activities and gaming boat operations has increased as a result of recent developments. Those companies offer vessel management services, ownership and investment opportunities.

Recently President Bush signed into law P.L. 102-251, which included provisions to partially redress the inability of potential U.S.-flag cruise operators to offer onboard gaming as is done on foreign-flag ships serving U.S. ports.

While important, the significance of the legislation is apparently misunderstood by some observers of the cruise industry and distorted by others. One widely read marine publication declared the law a failure because no U.S.-flag vessels had been built within six weeks of passage. One must wonder how even meeting with designers could be scheduled in that timeframe, let alone signing a contract, ordering materials and building a vessel in only six weeks.

One problem does remain, however, which limits the short term impact of the legislation in opening up the day cruise market. When E.L. 102-251 was passed it amended the Gambling Devices (Johnson) Act regarding the possession and transport of gaming equipment. It did not address the poorly crafted, ill defined Gambling Ship Act which prohibits U.S. citizen involvement in ships used "principally" for the purpose of gaming or offering "large scale commercial gambling." Unfortunately, those terms are not explained anywhere in federal law. In April 1991, the U.S. Department of Justice (DOJ) attempted for the first time in 40 years to explain the meaning of the law.

Essentially, DOJ said that a ship offering gaming was a gambling ship unless it called on a foreign port every voyage or stayed at sea for more than 24 hours and offered food



With the recent passage of new legislation, ship operators can now offer gambling aboard U.S. flag cruise ships the same as foreign-flag operations.

service and cabins to all passengers. DOJ then went on to say that their statement was only "guidance" not clarification and enforcement was up to the various federal attorneys whose replacement in the future could view the "guidance" differently.

In any event according to DOJ, a vessel could meet the guidance and still be in violation of, or fail to meet it and not violate the Gambling Ship Act. Since, with one exception, foreign-flag cruises-to-nowhere are apparently immune from DOJ action only prospective U.S.-flag operators continue to suffer the inequity. Each state has the authority to control or prohibit cruises-to-no-

where on the intrastate itineraries.

Enactment of E.L. 102-251 did clarify beyond a doubt the ability of U.S.-flag vessel to conduct gaming operations on international or inter-state voyages which will be beneficial over the long term. The law, however, is not an end unto itself and was not thought of by supporters as being such. Just as casino gaming is now an important source of onboard revenue for foreign-flag operators, it soon will be an important key to success for U.S.-flag operators as well. It is an important first step and further indication of the sea change which is occurring with regard to U.S.-flag cruise pros-

pects. To fully appreciate the importance of this development, some background is in order.

The enormous growth in the U.S.-based, foreign-flag cruise industry is, to a degree, the result of the absence of U.S.-flag competition. Until recently, less than strenuous enforcement of U.S. law and regulation against foreign-flag vessels also facilitated their operation. Without U.S.-flag competition, foreign operators were awarded the U.S. market by default. One of the reason that market grew rapidly is because of a confluence of trend among the American public, the source of 85 percent of worldwide cruise passengers. Significant among those trend is the willingness to spend greater amounts of disposable income for leisure activities. In spending that income, however, Americans are taking more, but shorter vacations.

Two increasingly popular leisure activities among Americans are cruise vacations/excursions and gaming pursuits. The parallel growth of those two activities has been a major factor in the development of the cruise sector. By not recognizing those trends and not removing competitive obstacles which prevented involvement by U.S.-flag operators, the industry became predominately a foreign-flag community [see table, page 8]. Where offshore shipboard gaming is involved, it has been an entirely foreign domain. That largely unregulated floating gaming industry is based in the United States and caters mostly to an American clientele, an irony not lost on the U.S. Government.

According to *Gaming & Wagering News*, from 1982 to 1990 the gross annual wager of the United States grew at 10.82 percent yearly, jumping from \$125.7 billion to \$286.2 billion, a staggering 127.55 percent increase. In 1990, \$1.8 billion of that amount was wagered in shipboard casinos and an undetermined amount via shipboard lotteries. Most of that money was wagered by Americans, but none on U.S.-flag ships. Studies done for cruise lines indicate that passengers prefer shipboard casinos to be larger, better appointed and open longer hours. Thus, shipboard gaming will eventually make an even greater contribution to the industry's bottom line. The fact that onboard gaming is critical to the success of the cruise industry awakened the U.S. Government to the need to grant equal treatment to its own national fleet.

A parallel development which also heightened official awareness and illuminated the possibilities for U.S. marine industries has been the rapid growth of state-authorized onboard gaming. The phenomenon began in Iowa with the first boat beginning operation in April 1991. Illinois followed shortly thereafter with the first operation beginning in Alton in September 1991. Since that time Mississippi, Louisiana, and Missouri have passed legislation which authorize waterborne gaming, although Missouri voters will have to approve it in a statewide referendum in November and Mississippi voters have a mixed record of approval in county referendums, there is interest in at least 15 other states. The market has not yet matured nationwide, although there has already been some repositioning of equipment from one market (Iowa) to another (Mississippi). While the state level activities comprise an industry unto itself, there are also some factor which underscore the potential for U.S.-flag cruise activities.

To date, state level waterborne gaming has been focused exclusively on inland waterways. The predominant inland gaming vessel configuration has been the paddlewheeler. That is primarily the result of a state requirement, usually related to the heritage factor in promoting

gaming boats as hubs for tourism development. As the industry moves into tidewater states where gaming vessels will have to cruise on open saltwater, larger monohull and especially SWATH vessels will be utilized. The latter design in particular portends well for U.S. interests.

As the recent launch of the Radisson Diamond indicates [see this month's cover story], there is much interest in this design for cruise purposes. The United States is particularly well situated to capitalize on interest in the SWATH approach. U.S. yard have built several SWATH vessels and an American firm designed the interiors on the Radisson ship. Currently, Ocean Systems, Navatek and SwathTech America (in conjunction with J.J. McMullen, Studio Bertolotti and McDermott, Inc.) all have impressive gaming boat designs available. SwathTech America through its marketing arm, WorldSwath, also has developed a revolutionary cruise ship design using a SWATH configuration for carrying up to 1,500 passengers.

That directly addresses another obstacle to U.S.-flag cruise activity which is the perceived inability of U.S. shipyards to deliver a quality cruise ship on time and at a reasonable price. Again, the current situation is dramatically different from just a short time ago. U.S. shipyard

labor costs are substantially lower than those in most countries which build cruise ships. Also, the extensive U.S. Navy construction work, which sustained the American shipbuilding base, is rapidly disappearing.

Consequently, some major and mid-size American yards are looking at cruise ship projects and discussing teaming arrangements with prominent European designers and builders in order to transfer technology and management expertise. This latter development prompted the President of one of the world's leading cruise lines to state at an industry conference that: "Fortunately, there are some exceptions and some competitive U.S. yards. With the proper investment, effort and motivation, I am convinced that they could redevelop the ability to construct cruise vessels on an internationally competitive basis."

Already, some of the reluctance to seriously consider an American shipbuilding or design alternative is being alleviated by the development of the domestic gaming boat sector. Boats designed for some markets will have a capacity for up to 3,500 passengers and, in addition to the obvious casino, will include other onboard amenities such as dining rooms, lounges, shops, arcades, etc. of significant size and complexity. It must be remembered that the gam-

ing boat industry is less than two years old. Notably, U.S. shipyards, designers and marine architects have demonstrated an ability to provide large, soundly built vessels, with well-appointed public spaces of a quality level sufficient to meet the demands of the existing market.

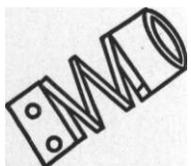
Also, operators of inland gaming boats pay substantial licensing fees, state taxes, some as high as 20 percent of adjusted gross gaming revenue, per passenger taxes and a variety of local fees in addition to the usual state and federal corporate taxes. Those operators utilize large onboard crews and shoreside staff at prevailing U.S. wages and under state and federal labor regulations. The structure of administrative rules, regulation and daily oversight are extensive and time consuming.

Yet that structure has not stopped the industry from prospering, especially in jurisdictions with less onerous requirements. In 1991, with less than a full year of operation, the gaming boats were the most popular new tourist attraction in the United States according to a travel industry survey. To date, more than 4.5 million people sailed on only eight gaming boats generating more than \$165 million in adjusted gross gaming revenue. At least seven more boats are coming on line in Illinois. In addition to those impressive figures can be added revenues from

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passage, dining/bars and gift shop/arcades. The foreign-flag cruise industry may boast to potential investors in public offerings that it weathered the recession and Operation Desert Storm. During the same period, however, an All-American industry exploded and is still growing!

Some analysts are beginning to re-examine the outdated belief that U.S. operating costs are prohibitive and regulations too burdensome. While certainly different from the cruise sector, the experience in the gaming boat market coupled with recent developments in federal law

is a strong indicator that a U.S.-flag cruise operation can succeed.

A splendid array of coastwise and nearby foreign itineraries, enhanced shipboard convention deductibility, and shipboard gaming coupled with marketing an American product will all help to propel the development of

a U.S.-flag cruise fleet. Not all the steps have been taken, but the progress made thus far and a growing determination on the part of U.S. marine industries to play a greater role will eventually launch a U.S.-flag industry which will not only survive but prosper.

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ADMIRAL CRUISES, Miami			CROWN CRUISE, Coral Gables			NORWEGIAN CRUISE, Miami			Renaissance V	100	ITA
Azure Seas	756	LIB	Crown Monarch			Norway	2044	BAH	Renaissance VI	100	ITA
Emerald Seas	776	LIB	CRYSTAL CRUISES, Los Angeles			Seaward	1798	BAH	Renaissance VII	100	ITA
CARNIVAL CRUISE, Miami			Crystal Harmony			Skyward	1798	BAH	Renaissance VIII	100	ITA
Cam ivale	1160	BAH	CUNARD, New York			Southward	754	BAH	ROYAL CARIBBEAN CRUISE, Miami		
Celebration	1900	LIB	Cunard Countess	796	BAH	Starward	758	BAH	Majesty of the Seas	2766	NOR
Ecstasy	2634	LIB	Cunard Princess, New York	802	BAH	Sunward	865	BAH	Monarch of the Seas	2766	NOR
Fantasy	2634	LIB	QE 2	1864	UK	Westward	865	BAH	Nordic Empress	2000	LIB
Festivale	1432	BAH	Sagafjord	618	BAH	OCEAN CRUISE, Ft. Lauderdale			Nordic Princess	1012	NOR
Holiday	1850	BAH	Vistafjord	749	BAH	Ocean Pearl	740	BAH	Song of America	1551	NOR
Jubilee	1900	LIB	Sea Goddess I	118	NOR	Ocean Princess	520	BAH	Song of Norway	1146	NOR
Mardi Gras	1100	BAH	Sea Goddess II	117	NOR	PAQUET FRENCH, Ft. Lauderdale			Sovereign of the Seas	2690	NOR
Tropicale	1400	LIB				Mermez			Sun Viking	882	NOR
CHANDRIS CRUISES, Miami			DIAMOND CRUISE, Miami			PREMIER CRUISE, Miami			Viking Serenade	1840	BAH
Amerikanis	617	PAN	Radisson Diamond			Starship Atlantic	1769	UB	ROYAL CRUISE, San Francisco		
Azur	660	PAN	DOLPHIN CRUISE, Miami			Starship Majestic	1032	BAH	Crown Odyssey	1052	BAH
Britanis	926	PAN	Dolphin IV	692	PAN	Starship Oceanic	1934	BAH	Golden Odyssey	460	BAH
Horizon	1354	LIB	Seabreeze	1100	PAN	PRINCESS CRUISE, Los Angeles			Royal Odyssey	812	BAH
Meridian	1106	BAH	DOLPHN HELLAS CRUISES, L			Crown Princess	1690	ITA	ROYAL VIKING, Miami		
Victoria	548	PAN	Aegean Dolphin			Dawn Princess	1467	UB	Royal Viking Queen	212	BAH
Zenith	1374	LIB	EPIROTIKI LINES, New York			Fair Princess	1467	UB	Royal Viking Sun	740	BAH
CLUB MED, Scottsdale, AZ			Jason	268	GRE	Island Princess	610	UK	SEABOURN CRUISE, San Francisco		
Club Med I			Neptune	190	GRE	Pacific Princess	610	UK	Seabourn Pride	204	NOR
COMMODORE CRUISE, Coral (Odysseus	485	GRE	Regal Princess	1590	ITA	Seabourn Spirit	204	NOR
Caribe I	1160	PAN	Orpheus	288	GRE	Royal Princess	1200	UK	SEVEN SEAS CRUISE, Vancouver, B.C.		
Enchanted Isle	848	PAN	Sunward II	670	BAH	Sky Princess	1400	LIB	Song of Flower		
Enchanted Seas	850	PAN	World Renaissance	450	GRE	Star Princess	1470	LIB	SUN UNE CRUISES, New York		
COSTA CRUISE, Miami			HOLLAND AMERICA, Seattle			REGENCY CRUISES, Miami			Stella Oceania	369	GRE
Carta Costa	748	ITA	Nieuw Amsterdam	1214	NAN	Regent Sea	760	BAH	Stella Solaris	620	GRE
Costa Classica	1800	ITA	Noordam	1214	NAN	Regent Star	1000	BAH	WINDSTAR CRUISES, Seattle		
Costa Marine	1026	ITA	Rotterdam	1075	NAN	Regent Sun	836	BAH	Wind Song	158	BAH
Costa Riviera	984	ITA	Westerdam	1494	BAH	RENAISSANCE CRUISES, Ft. Lauderdale			Wind Spirit	158	BAH
Danae	404	LIB	MAJESTY CRUISE, Miami			Renaissance I	100	ITA	Wind Star	158	BAH
Daphne	406	LIB	Royal Majesty			Renaissance II	100	ITA			
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Because of recent environmental protection decisions taken by the U.S. and European Community, shipowners are aware that a worldwide ban on CFC emissions is imminent. The implications of the Montreal Protocol, an international agreement to end all ozone-threatening chemical production within 10 years, are: minimized refrigerant emissions; mandatory annual preventive inspections; CFCs unavailable from 1995; price and tax increase on refrigerants; mandatory recovery units; service and installation legislation; improved crew training; and the logging of refrigerant consumption.

Unitor's "Phase-out" concept provides everything an owner needs to operate his vessels in compliance with international regulations, from safe gases and reclaiming to service and control. For more information about Unitor's CFC refrigerant "Phase-Out" concept,

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Vancouver Shipyards Co., Ltd., Vancouver, B.C., has completed the drydocking of the 30,000-dwt tanker Petrobulk Rover for Naess Holland. The work was completed by Vancouver Shipyards in its Panamax floating drydock.

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World Shipbuilding Level Remains High

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scheduled for delivery by the end of 1993.

Of the total order book, ships under construction represented 17 million gt (1,355 ships), while orders not commenced amounted to 26.1 million gt (1,092 ships).

New orders reported placed during the first quarter of 1992 amounted to 5.2 million gt, down by 0.7 million gt from the December quarter. Completions, also amount-

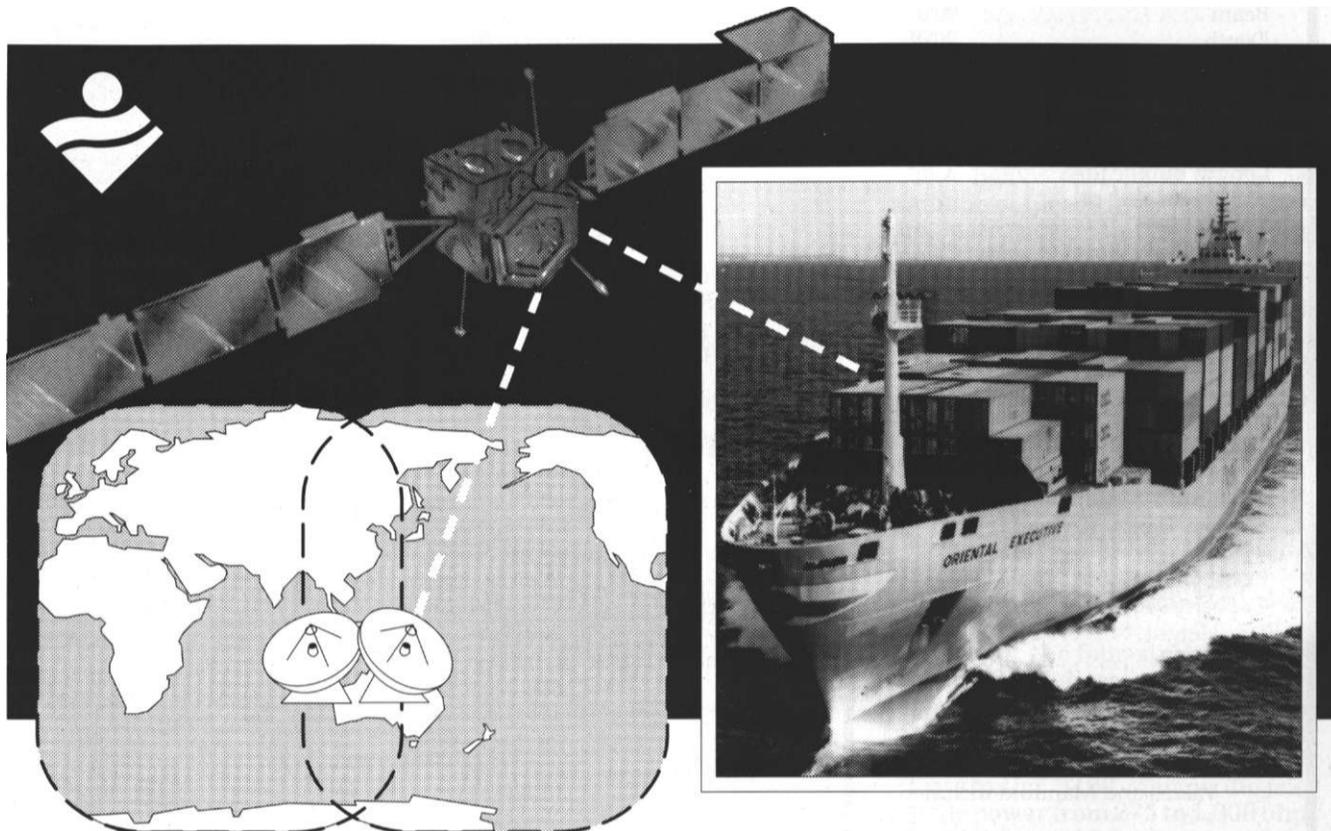
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three in-line six-cylinder models, ranging from 240 hp at 1,850 rpm to 430 hp at 1,800 rpm.

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The DKM Series incorporates two in-line models, one a six cylinder and the other an eight cylinder, ranging in power from 3,000 hp at 720 rpm to 4,000 hp at 720 rpm.

The DVM Series has six "V" models, three 6- and three 8-cylinder diesels, ranging in power from 2,100 hp at 900 rpm to 6,000 hp at 600 rpm.

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The high-speed 4039DFM for workboat propulsion power provides 80 hp at 2,500 rpm, while for genset applications, it supplies 43 kw at 1,800 rpm.

The second diesel of the 300 Series, the 4045TFM, provides 115 hp at 2,400 rpm for propulsion applications, and 75 kw at 1,800 rpm for auxiliary power uses.

What other color would you paint an engine designed to keep you going no matter what?

Over the years, Volvo Penta green has come to stand for strength, reliability, fuel efficiency, and exceptionally long service life in workboat engines around the world. And that combination of attributes has never been more important than it is today.

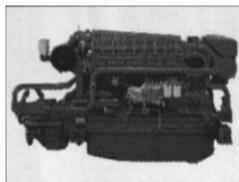
Gone are the days when you could trade a little fuel economy for added horsepower. Today you need both.

Gone are the days when an extra overhaul or two didn't affect the bottom line all that much. With today's thin profit margins, high maintenance costs can really hurt.

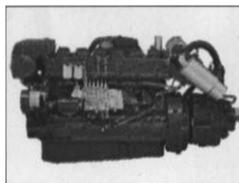
If you are about to outfit or repower a workboat without considering Volvo Penta, stop! Call Rob Miltz at (804) 436-2800. Find out how Volvo Penta's eight decades of marine engineering experience and renowned manufacturing standards have led to the kind of marine diesel engines you need today.

Volvo Penta. Engines that offer low noise and low exhaust-emission levels. Engines that provide superb fuel economy. Engines that are easy and economical to maintain. Engines designed to keep you going for a long, long time.

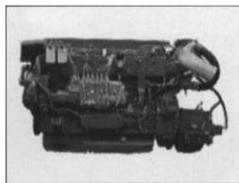
Yes, even when the going gets tough.



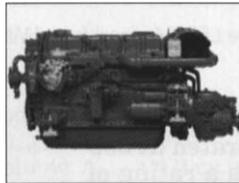
TAMD 162



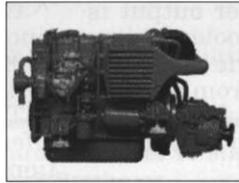
TAMD 122



TAMD 71



TAMD 41



TAMD 31

GREEN MEANS GO, NO MATTER WHAT THE CONDITIONS.

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Circle 263 on Reader Service Card

Maritime Reporter/Engineering News

Unitor Offers Shipowners CFC 'Phase-Out' Concept

Anticipating worldwide concern about chlorofluorocarbon (CFC) emissions and the depletion of the ozone layer, Norway's international ship supply specialist Unitor AS has prepared a "Phase-Out" concept to help shipowners switch to more environmentally friendly refrigerants such as: hydrochlorofluorocarbon (HCFC), hydrofluorocarbon (HFC), ammonia and propane.

Because of recent environmental protection decisions taken by the U.S. and European Community, shipowners are aware that a worldwide ban on CFC emissions is imminent. The implications of the Montreal Protocol, an international agreement to end all ozone-threatening chemical production within 10 years, are: minimized refrigerant emissions; mandatory annual preventive inspections; CFCs unavailable from 1995; price and tax increase on refrigerants; mandatory recovery units; service and installation legislation; improved crew training; and the logging of refrigerant consumption.

Unitor's "Phase-out" concept provides everything an owner needs to operate his vessels in compliance with international regulations, from safe gases and reclaiming to service and control. For more information about Unitor's CFC refrigerant "Phase-Out" concept,

Circle 17 on Reader Service Card

Tanker Drydocked At Vancouver Shipyards

Vancouver Shipyards Co., Ltd., Vancouver, B.C., has completed the drydocking of the 30,000-dwt tanker Petrobulk Rover for Naess Holland. The work was completed by Vancouver Shipyards in its Panamax floating drydock.

Other work recently completed at the yard includes the drydocking of the 30,000-dwt Finnish bulk carrier Finnwood for hull damage repairs, and the drydocking of Commodore Cruises' Enchanted Isle.

For free literature detailing the ship repair services of Vancouver Shipyards,

Circle 6 on Reader Service Card

World Shipbuilding Level Remains High

The latest quarterly shipbuilding statistics from Lloyd's Register show an increase of 1.1 million gross tonnage in ships under construction. The statistics for the quarter ending March 31, 1992 showed that ships under construction and on order totaled 43.1 million gt, just below the end of 1991 level, which was the highest total in 14 years. Over 80 percent of the order book is

scheduled for delivery by the end of 1993.

Of the total order book, ships under construction represented 17 million gt (1,355 ships), while orders not commenced amounted to 26.1 million gt (1,092 ships).

New orders reported placed during the first quarter of 1992 amounted to 5.2 million gt, down by 0.7 million gt from the December quarter. Completions, also amount-

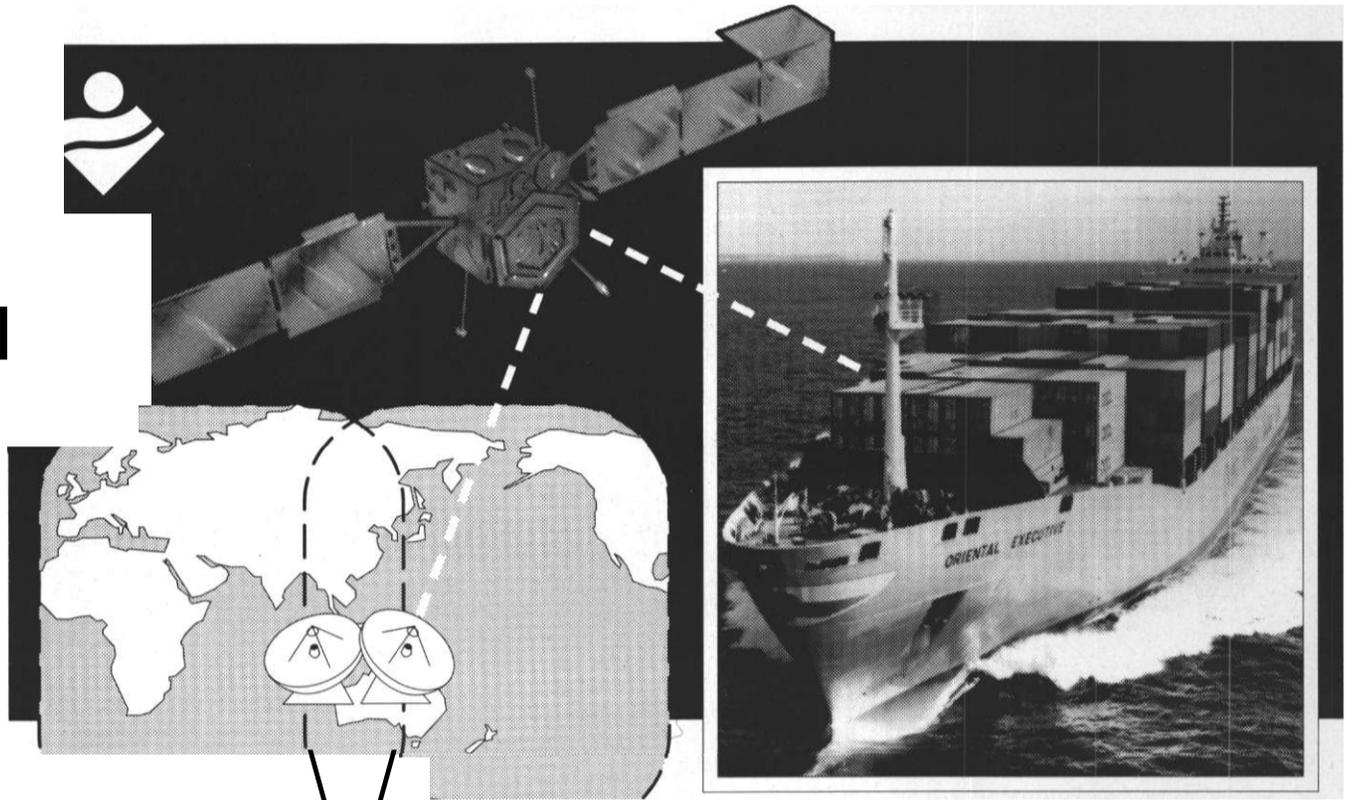
ing to 5.2 million gt, increased by 1.3 million gt compared with the previous quarter.

White Named PRMMI's General Manager Of Operations, North America

James J. White was recently selected by Puerto Rico Marine

Management, Inc. (PRMMI), Edison, N.J., to be the new general manager of operations for North America.

Mr. White was general operations manager for the Northeast. He will be responsible for port authority affairs, negotiating stevedore contracts and handling port labor relations. Mr. White joined PRMMI in 1985 as operations manager.



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OCEAN DECK BARGES

Length.....	299'0"	302'0"
Beam.....	90'0"	76'0"
Depth.....	20'0"	20'0"
Deadrise.....	-	2'0"
Draft Light.....	27-1/2"	3'10"
Draft Loaded.....	15'10"	16'
Transverse Bulkheads.....	7	8
Length Bulkheads.....	3	1
No. Tanks.....	32	18
Rolled Bilge.....	-	24"
Curved Rake Bow.....	29'	49'
Long Flat Raked Stern.....	30'	50' Long Curved Rake
Deck Open Deck Area ..	25,284 S.F.	19,950 S.F.
Cargo: Deck Load	2,050 P.S.F.	2,500 P.S.F.
D.W.T.....	9,604 LTSW	7,236 LTSW

Maltese Cross A-1 Deck Barges



TANKS

Steel Skid-Mounted Liquid Storage Tanks. 10 Available.

Coast Guard Approved
Capacity..... 475 BBLS
Height..... 7'0"
Width..... 2'0"
Length..... 32'0"
Piping..... Single fill pipe and distribution.
Gravity Discharge.
Valves and Manifold included.

CRANES

Whirley Crane

Model & Type..... Clyde 37 DB-145-20 Whirley Crane
Manufacturer..... Clyde Iron Works
Capacity..... 200 Tons
Main Hoist..... Certified Rating of 400,000 lbs. @ 47' Radius; 150,000 lbs. @ 150' Radius. (16 part rigging)
Whip Tackle..... 2 part, 40,000 lbs. @ Radiuses to 160' max.

Excellent Condition

LIFT TRUCKS

Two Taylor Lift Trucks, Model TE 220S

22,000 lbs. Basic Capacity at a 24" Load Center.
Cummins Diesel Engine Model 6BT developing 151 HP at 2500 R.P.M.
Taylor 3-speed Power Shift Transmission. Separate transmission oil cooler.
216" Lift Ultra View mast with an over-all lowered height of 168".
84" Wide Hydraulic side shift with 10" of total shift.
Fully enclosed cab with heater, defroster and front wiper.

MALTESE CROSS A-1 OIL TANK BARGE

Length..... 296'0"
Beam..... 60'0"
Depth..... 22'0"
Deadrise..... 6"
Number of Tanks..... 12
Total Tank Volumes at 95%..... 50,700 BBLS
Cargo Pumps..... 3 Rotary Twin Screw, Allweiler 231
Rating..... 1,500 GPM, 150 PSI, 1,200 RPM
Location..... After Rake
Diesel Engines..... 3 Detroit Diesel 8V-71, 233 HP @ 1,800 RPM
Location..... Engine Room on After Deck
Fuel Capacity..... 1421.3 Gal. Diesel
Fill & Discharge Connections .. 10" & 8"
Heating Coils..... 2" Sch. 80 Pipe Coils for Shore Steam Supply
Hull Plating..... Side Shell 1/2", Bottom 7/16", Deck 1/2"
Deck Cargo Dwt. at Loadline .. 6761 LTSW



SPLIT TYPE SELF-DUMPING SCOWS



Length..... 180'0"
Beam..... 50'0"
Depth of Mid-Body..... 14'0"
Hopper Length..... 128'0"
Level Hopper Volume..... t,421 cu. yd.
DWT @ d = 10.22 ft..... 1,615 L.T.
Rake Lengths F. & A..... 26'0"
Twin Skegs
Stern & Fwd. Rake Decks Stepped up 2'0"
Engine GM 671

Hydraulic Pumps 12 GPM & 75 GPM
Time to Open (Fully Closed to Fully Open).. 6 Min. 5 Sec.
Time to Close..... 4 Min. 34 Sec.
Hopper Angle Fully Open..... 53.78 degrees
Fuel Tank Capacity..... 445 Gal.
Hydraulic Cylinders..... 18" Diam. 120" Stroke (2 Fwd. & 2 Aft)
Plating..... Side, 9/16", Bottom, 5/8" Hopper, 5/8"

ZIDELL
MARINE GROUP

For additional information or to make an appointment to inspect, write or call:
Sam Replin or Jack Breshears
3121 S.W. Moody Avenue, Portland, Oregon 97201
Phone: 1-800-547-9259, In Oregon (503) 228-8691 Fax: (503) 228-6750

INSIDE

DIESEL POWER

In response to the constant demand for improved performance and increased efficiency from vessel operators, a number of marine diesel manufacturers have either upgraded their existing engines, expanded current series or developed entirely new models.

Additionally, new environmental standards, such as those regulating nitrogen oxide emissions, have also played a key role in the introduction of and research into new diesels. Most major marine engine manufacturers are investing heavily into research programs to develop new reduced emission diesels. Some, in fact, are introducing models which use LNG or even LPG.

Wartsila Diesel, for example, recently tested its Vasa 32 engine on LPG, which is extremely clean burning. According to Wartsila, the Vasa 32 engine tests showed very promising results, and a pilot plant is expected to be started within the next few months. Wartsila Diesel is reportedly the first diesel manufacturer to test LPG in medium-speed engines utilizing high-pressure fuel injection.

"Inside Diesel Power" is a brief examination of some of the latest solutions for the 1990s from the world's leading marine diesel engine manufacturers for propulsion and shipboard power applications.

For further information on any of the marine diesel engines discussed in this review, circle the appropriate Reader Service number on the post-paid card bound into the back of this issue.

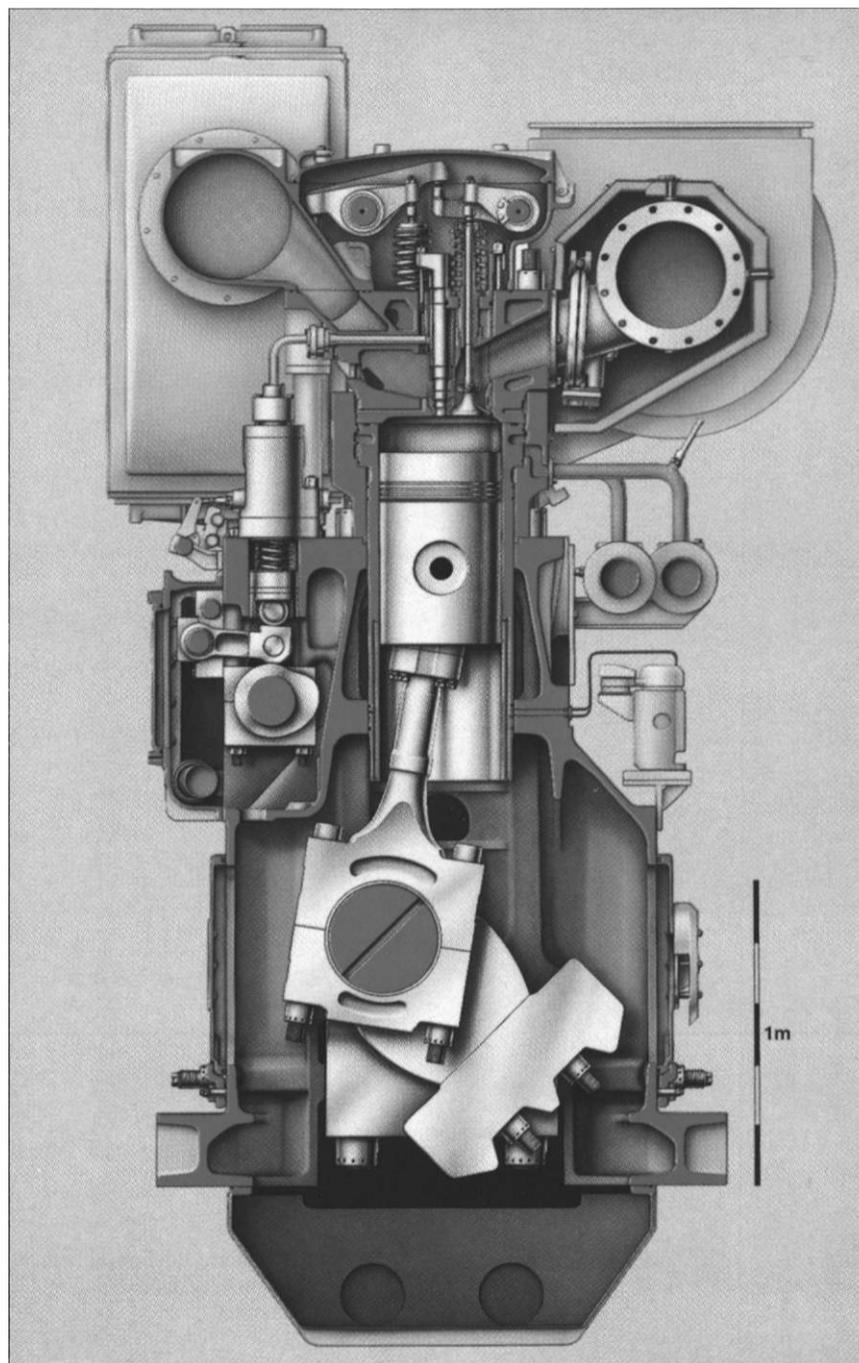
ALASKA DIESEL ELECTRIC

The Lugger L6140AL, L6170A and L12V140A diesels from Alaska Diesel Electric, Inc., Seattle, Wash., are targeted for the commercial user whose main concerns are low life cycle costs and low fuel consumption.

The L6140AL, an in-line six, has a continuous rating of 470 hp at 1,800 rpm, a medium rating of 550 hp at 2,100 rpm, and a maximum rating of 630 hp at 2,100 rpm. The engine is also used in a 330-kw 1,800-rpm Northern Lights marine generator set with the same power-take-off features.

A 170-mm bore provides the in-line six-cylinder L6170A with 640-hp at 1,800 rpm continuous duty operation. It has a maximum rating of 825 hp at 2,100 rpm and a medium rating of 730 hp at 2,000 rpm. The 170 is the most recent of the Luggers to be put in service.

Soon to be delivered will be the



Cross-sectional drawing of the L58/64 diesel from MAN B&W's medium-speed engine family.

12-cylinder L12V140A, rated at 950 hp at 1,800 rpm. It has a rating of 1,300 hp at 2,100 rpm for high-speed applications. The power output is maximized by its after-cooler design.

Alaska Diesel Electric manufactures propulsion units from 87 hp to 1,300 hp and Northern Lights Marine Generator sets from 5 kw to 330 kw.

For further information on Alaska Diesel Electric,

Circle 30 on Reader Service Card

CATERPILLAR

Caterpillar, Inc., offers three distinct engine families—the 3400, 3500 and 3600—to meet the needs of its marine customers.

The 3600 diesel engine series is offered in two distinct configurations—distillate and heavy fuel—each optimized to provide the lowest operating cost on the fuel used.

The Cat 3600 engine, fully optimized for distillate fuel operation, can be economically converted at a

convenient overhaul point to an equally optimized heavy fuel configuration.

The heavy fuel 3600 model is available in speeds from 720 to 1,000 rpm, with power outputs ranging from 218 to 280 hp per cylinder. Models are available in six- and eight-cylinder in-line versions and 12- and 16-cylinder "V" configurations, providing as much as 4,480 hp. Caterpillar recently delivered its 500th engine in its 3600 Family to a shipyard in Holland for installation aboard the M.B. Thames. The model 3606 was rated at 2,146 hp at 900 rpm.

Caterpillar's 3500 diesel engine family includes three versions—V-8, V-12 and V-16. Designed to lower fuel consumption, oil and maintenance costs, the four-stroke, direct-injection 3500 diesel engine family is available in speeds from 1,200 to 1,800 rpm, with power outputs as high as 2,200 hp.

Caterpillar 3400 marine diesels provide power from 275 to 1,000 bhp (205-746 kw), with three models available—Cat 3406, 3408 and 3412—the company's largest selling marine diesels.

For free literature detailing the Cat marine diesel engine line,

Circle 34 on Reader Service Card

COLTEC

The Fairbanks Morse Engine Division, Coltec Industries, offers a complete line of modern marine medium-speed diesel engines, ranging in power from 640 to 29,322 bhp.

Fairbanks Morse currently manufactures the largest medium-speed diesel in the U.S., the Colt-Pielstick PC4.2. The U.S. Navy's Henry J. Kaiser Class (T-AO-187) fleet oilers are each powered by a pair of 10-cylinder PC4.2s, producing over 16,000 bhp.

According to Fairbanks Morse, the PC4.2 marine engines are 60 percent more fuel efficient than some gas turbines and require less engine room space than some slow-speed diesel engines.

Besides the PC4.2, Fairbanks Morse also manufactures the PC2 Series, a four-cycle turbocharged engine. Colt-Pielstick PC2 medium-speed diesels propel the U.S. Navy's dock landing ship class (LSD). Available in a 6- to 18-cylinder range in "V" and in-line configurations, the PC2 powers over 1,400 vessels worldwide, totaling 2,200 engines and 15.3 million hp.

Available as a blower scavenged

or turbocharged model, Fairbanks Morse two-cycle opposed piston (OP) engine has proven to be an efficient and reliable design for over 50 years. Upgraded and modified, the OP continues to be a popular choice for over 45 different classes of U.S. Navy vessels, as well as applications in towboats, tugs and ferries, offshore platforms, emergency standby generators and diesel-electric power plants.

For free literature detailing Fairbanks Morse, Coltec Industries marine diesels,

Circle 46 on Reader Service Card

DAIHATSU DIESEL

Daihatsu medium-speed diesel engines, reduction gears, and sys-

tems for use as marine propulsion plants are original developments of Daihatsu Diesel Mfg. Co., Ltd., and are specially designed to feature durable construction and total economy.

Daihatsu manufactures four marine diesel engine series—M, DLM, DKM, and DVM models—ranging in power output from 200 to 6,000 hp in single unit installations.

The four-stroke M Series features

three in-line six-cylinder models, ranging from 240 hp at 1,850 rpm to 430 hp at 1,800 rpm.

The DLM Series has 11 in-line models with either six or eight cylinders. The in-line diesels range in power output from 600 hp at 1,350 rpm to 4,200 hp at 500 rpm.

The DKM Series incorporates two in-line models, one a six cylinder and the other an eight cylinder, ranging in power from 3,000 hp at 720 rpm to 4,000 hp at 720 rpm.

The DVM Series has six "V" models, three 6- and three 8-cylinder diesels, ranging in power from 2,100 hp at 900 rpm to 6,000 hp at 600 rpm.

Models with bores of 240 mm or more of the DLM, DVM and DKM Series can burn heavy fuel oil.

For free literature detailing Daihatsu diesels,

Circle 32 on Reader Service Card

DETROIT DIESEL

Detroit Diesel Corporation (DDC) provides a complete line of premium marine engines.

For crew boats, fire boats and patrol boats, where speed is a critical factor and reliability a must, Detroit Diesels are highly regarded for easy starting, immediate acceptance of load, quick acceleration and reliable high speed. DDC can provide premium engines up to 2,200 bhp.

Commercial marine engine power levels range from 107 hp in the 4-53 to 2,200 hp in the 16V-149TI.

Detroit Diesels include: the compact V-8 8.2 Liter, with an output of up to 250 bhp; the Series 53, for smaller workboats, with up to 400 bhp; the Series 71, with up to 900 bhp; the Series 92, available in 6-, 8-, 12- and 16-V configurations, with up to 1,400 bhp; and the Series 149, for river towboats and ocean tugs, with up to 2,200 bhp.

For free literature detailing the complete family of DDC engines,

Circle 35 on Reader Service Card

DEERE POWER

The first marine power plants offered by Deere Power Systems Group are its four-cylinder 300 Series 4039 and 4045 and six-cylinder 400 Series 6076.

Long-established in the construction, agriculture and forestry industries, with over 3 million diesel engines delivered, Deere has drawn on this experience to design and build its four- and six-cylinder marine diesels.

The high-speed 4039DFM for workboat propulsion power provides 80 hp at 2,500 rpm, while for genset applications, it supplies 43 kw at 1,800 rpm.

The second diesel of the 300 Series, the 4045TFM, provides 115 hp at 2,400 rpm for propulsion applications, and 75 kw at 1,800 rpm for auxiliary power uses.

What other color would you paint an engine designed to keep you going no matter what?

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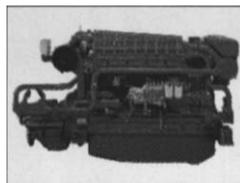
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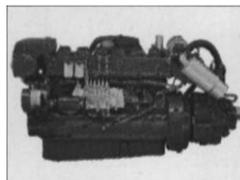
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Volvo Penta. Engines that offer low noise and low exhaust-emission levels. Engines that provide superb fuel economy. Engines that are easy and economical to maintain. Engines designed to keep you going for a long, long time.

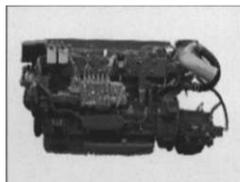
Yes, even when the going gets tough.



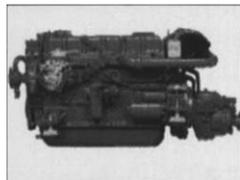
TAMD 162



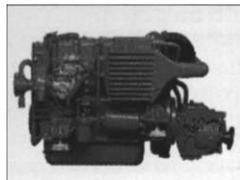
TAMD 122



TAMD 71



TAMD 41



TAMD 31

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Circle 263 on Reader Service Card

714 * ; ' ; T - "

GREEN MEANS GO,

CONDITIONS.

The largest marine diesel offered by Deere is the six-cylinder 400 Series 6076AFM. The in-line four-cycle model boasts 250 hp at 2,200 rpm as main propulsion and 187 kw at 1,800 for genset usage.

For free literature fully describing the 300 and 400 Series marine diesels from Deere Power Systems,

Circle 45 on Reader Service Card

EMD

The Electro-Motive Division (EMD) of General Motors produces diesel power for marine propulsion, offshore and land-based oil well drilling rigs, power generation and other industries.

A complete line of GM/EMD engines is available to meet requirements for marine propulsion and marine generator set applications. A complete power package with engine, reverse-reduction gear or generator and accessories is available from EMD power products distributors worldwide. The propulsion units are also available without skid mounting for direct application to the vessel structure.

For marine propulsion, EMD offers eight-, 12-, and 16-cylinder Roots Blown 645E6 Series engines and eight-, 12-, 16- and 20-cylinder turbocharged 645F7B and 710G7A diesels. The Roots Blown models offer a power range from 1,050 to 2,100 at 900 rpm, while turbocharged models have outputs from 1,600 to 4,200 at 800 rpm and 1,700 to 4,500 at 900 rpm.

For genset applications, EMD engines cover a continuous output range from 745 to 3,220 kw at 60 Hz-900 rpm and 570 to 2,865 kw at 50 Hz-750 rpm.

For free literature detailing EMD marine diesels,

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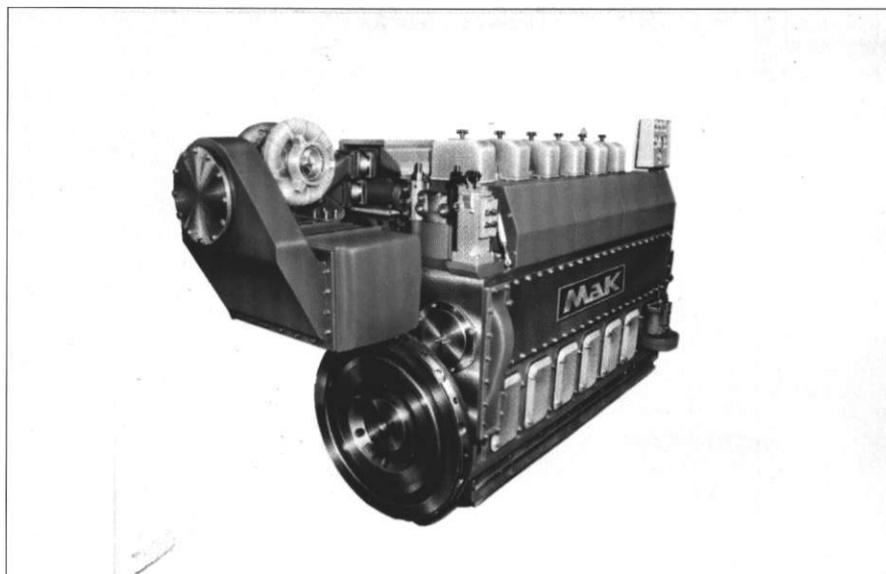
KHD

Klockner-Humboldt-Deutz (KHD), one of the world's largest manufacturers of air-cooled engines, has introduced a new liquid-cooled engine series, the FM 1012/1013, with an integral or separate cooling system.

The company sees its role as a totally integrated supplier to plant and equipment manufacturers and, with its ranges of air-cooled, air/oil-cooled and new liquid-cooled diesel engines, alongside its broad range of medium and large water-cooled prime movers from 10 kw to 7,500 kw (13 to 10,058 hp), will be able to satisfy an enormous variety of shipbuilding and power generation applications.

Certain models of the new series will start coming off the standard production lines by the end of this year. The complete new generation of 1012/1013 engines, with power outputs from 45 to 190 kw (60 to 255 hp) will be generally available by mid-1994.

Also offered by Deutz MWM, a subsidiary of the KHD Group, are: TBD 234 Series, with outputs rang-



The new long-stroke M 20 diesel from Krupp MaK.

ing from 141 to 1,224 hp; TBD 234Y Series, with outputs as high as 1,400 hp; TBD 604B Series, with outputs up to 2,630 hp; 628 Series, with outputs up to 3,600 hp; 640 Series, with outputs to 9,467 hp; and the 645 Series, with power outputs to 5,202 hp.

For free literature detailing the KHD line of marine diesels,

Circle 37 on Reader Service Card

KRUPP MAK

Krupp MaK markets medium-speed diesel engines in the power range from 1,073 to 14,751 hp. The German engine builder offers four different series, both as in-line and "V" configurations, with speeds between 425 and 1,000 rpm.

The goal of the current Krupp MaK C engine program is to incorporate the latest developments to improve economy, operational safety and exhaust emissions.

Krupp MaK recently added the M 20 engine series to its medium-speed diesel line.

The M 20 is a long-stroke engine with 200 mm diameter and a stroke of 300 mm in the output range from 900 to 2,700 kw (1,207 to 3,621 hp) at 1,000 rpm. The M 20 is available in six, 8 and 9 cylinders in-line and 12 and 16 cylinders in a "V" configuration with speeds between 900 to 1,000 rpm.

The M 20 is geared toward coastal and inland vessels both as main propulsion and auxiliary power applications.

Krupp MaK reports the fuel consumption to be about 183 g/kwh. The new model is suitable for both main propulsion and auxiliary power and can be operated on all established grades of heavy fuel oil.

For free literature detailing the new M 20 diesel from Krupp MaK or any other the other medium-speed engines from the company,

Circle 38 on Reader Service Card

MAN B&W DIESEL

MAN B&W is a wholly

owned subsidiary of MAN Aktiengesellschaft Munchen and a leading manufacturer and designer of two-stroke and four-stroke diesel engines and exhaust gas turbochargers.

MAN B&W has facilities in Augsburg and Hamburg, Germany, and Copenhagen, Frederikshavn and Holeby, Denmark, as well as over 30 licensees around the world.

At the Augsburg Works, 20/27, 25/30, 32/36, 40/45, 40/54, 48/60, 52/55 B and 58/64 Series medium-speed four-stroke marine diesel engines are manufactured, with a power range of 610 to 19,000 hp. Dual fuel engines with an output range from 550 to 2,205 hp are also built, as well as exhaust gas turbochargers for two- and four-stroke engines.

The company's four-stroke diesel engine program has been developed to meet the market requirements of: lower fuel consumption; lower lube oil consumption; longer times between overhauls; and simplified engine maintenance.

Facilities at Copenhagen manufacture MC, L-MC, K-MC and S-MC Series slow-speed two-stroke diesel engines for marine and stationary applications in the output range from 1,350-67,080 hp.

The Holeby Works manufactures and four-stroke diesel gensets for seagoing, coastal and fishing vessels in the power range from 720-5,400 hp, while the Frederikshavn Works offers complete model 28/32 and 23/30 Alpha propulsion systems and Alphantronic electronic remote control systems.

For free literature detailing MAN B&W Diesel's complete marine engine line,

Circle 31 on Reader Service Card

MTU

A leading manufacturer of high-speed diesels, MTU offers liquid-cooled, compact four-stroke engines. Over 53,000 units are in operation, 16,000 of which are serving in main propulsion or ship service applications.

MTU's marine engine program includes five engine series: 099, 183,

396, 595 and 1163. Propulsion power ratings for the engines range from 71 to 8,160 hp.

The 099 and 183 series both comprise turbocharged, turbocharged/intercooled or naturally aspirated variants. The 099 series consists of 4- and 6-cylinder in-line engines, offering a broad marine power spectrum from 70 to 190 hp.

The 183 Series features 8-, 10-, and 12-cylinder "V" engines, with power from 229 to 738 hp.

The 396 Series includes 8-, 12- and 16-cylinder turbocharged and intercooled diesels offering power ratings from 912 to 3,004 hp at speeds between 1,650 and 2,000 rpm.

The new 595 Series has been developed by MTU to meet "the commercial ship operator's technical and economical requirements of the 1990s." The series includes high-performance 12- and 16-cylinder marine models in the power range from 2,655 to 4,828 hp.

The most powerful engines offered by MTU, the 1163 Series, have an output range covering from 3,259 to 8,046 hp. Models are available in 12-, 16- and 20-cylinder "V" configurations.

For free literature detailing MTU diesels,

Circle 33 on Reader Service Card

NEW SULZER DIESEL

In response to market demands, New Sulzer Diesel Ltd., a leading manufacturer of two- and four-stroke diesels, has designed their engines to meet the following criteria: reliability; fuel economy; cost-efficient design and low emissions.

The company's low-speed engine program comprises two basic models—the RTA-8 Series and the RTA-2 Series. The RTA-8 Series are suitable for relatively fast vessels that have a limited draft and restricted propeller diameter. The RTA-2 Series, on the other hand, is suitable for relatively slow ships for which optimum sailing speed is dependent upon such factors as fuel costs, capital costs and value of transported goods.

New Sulzer Diesel's four-stroke engine program includes—the ZA40, AT25, AS25 and S20.

The ZA40S engine has become one of the most popular in its class for marine and power generation applications. Over 240 ZA40S engines, totaling 2.29 million bhp have been ordered since their introduction in 1985.

The AT25, upgraded in 1987 in order to obtain full heavy fuel capability and fuel efficiency, incorporates the latest state-of-the-art design features for engines of its class.

The long-stroke S20 engine, launched in 1988, is the smallest member of the Sulzer diesel engine family. Offered in in-line models with four, six, eight and nine cylinders, the S20 offers 700 to 1,960 bhp at speeds from 720 to 1,000 rpm.

For complete information on New Sulzer Diesel two- and four-stroke engines,

Circle 39 on Reader Service Card

PAXMAN DIESEL

Paxman Diesels Limited, part of the international company GEC Alsthom, manufactures high-speed Valenta and Vega diesels in the power range of 750 to 3,650 kw (1,006 to 4,895 hp). Paxman engines have been particularly popular in patrol boat and minesweeper vessel applications.

In the U.S., product support is

provided by Paxman Diesel USA of Houston, Texas. The company offers complete after-sales support service for North America.

The most recent Paxman patrol craft success is the prestigious contract to supply Valenta propulsion engines to the U.S. Navy for its new Patrol Boat, Coastal (PBC) program. The Valenta 16RP200CM propulsion engines, four per vessel set, for the PBC program are currently be-

ing delivered to Lockport, La., shipbuilder Bollinger Machine Shop & Shipyard, Inc. The first of the 170-foot vessels was recently delivered. These engines are the first of a total of 52 Valentas, comprising 13 boat sets, which Paxman is supplying to the U.S. Navy.

Prior to the PBC engine contract, Paxman received an order from the Royal Navy of Oman to supply Valenta engines for the 56-

meter high-speed Province Class vessels. Each of the vessels will be powered by four Valenta 18-cylinder propulsion units, each rated at 4,550 bhp.

For free literature detailing Vega and Valenta engines from Paxman Diesel,

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Circle 261 on Reader Service Card

MITSUBISHI

In an effort to broaden its market appeal, Mitsubishi Heavy Industries Ltd. extended the power range at lower end of its two-stroke UEC engine series with a new small bore diesel design. The Japanese firm added the 330-mm bore UEC 33LSII, which is offered in four- and eight-cylinder versions, covering an output range from 1,590-5,870 bhp at 158-210 rpms. The new model has a longer stroke as compared to the 370-mm stroke model, which was the smallest bore model in the UEC family prior to the UEC 33LSII's introduction. The longer stroke provides enhanced fuel economy and the new design is said to offer high reliability and simplified maintenance.

Earlier, Mitsubishi had added two large bore models to the UEC series for the bulkier and very large crude carrier markets. One of the models, a 30,000-bhp six-cylinder 850-mm bore UEC 85LSII, was recently commissioned in a Japanese VLCC. The other model, the 750-mm bore UEC 75LSII, was installed in the first of seven AP Moller VLCCs being built by the Odense yard in Denmark.

For free literature detailing Mitsubishi diesels,

Circle 41 on Reader Service Card

VOLVO PENTA

A wholly owned subsidiary of AB Volvo, Volvo Penta develops, designs manufactures and markets diesel and gasoline engines, marine transmissions and industrial components and accessories.

A popular choice for pleasure craft, Volvo Penta engines are also available for the workboat market.

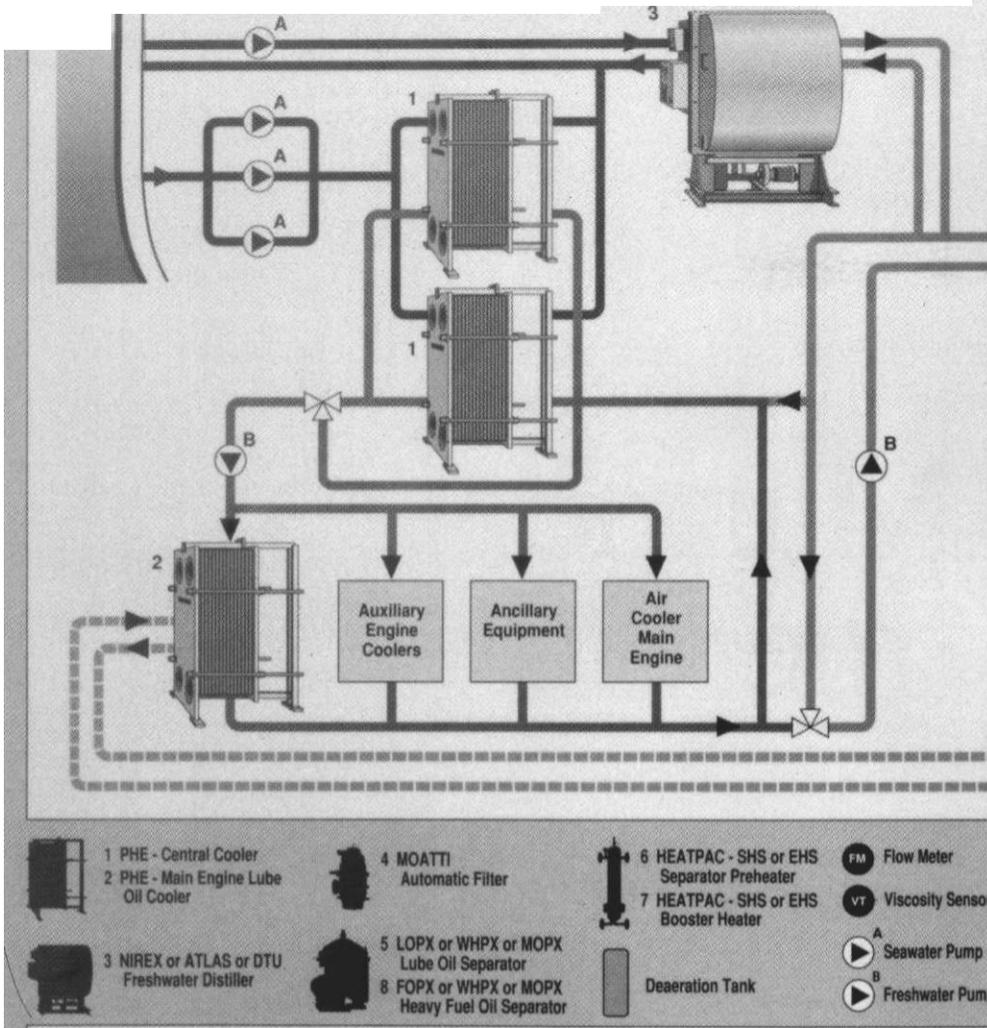
The TAMD 162 is the largest and most powerful engine ever built by Volvo Penta. It is a turbocharged and aftercooled in-line six-cylinder diesel, with a light duty rating of 551 hp at 1,900 rpm, medium-duty rating of 490 hp at 1,900 rpm and heavy-duty rating of 470 hp at 1,800 rpm.

Two direct-injected, in-line sixes with turbocharging, the models TAMD 122 and TMD 122 offer a power range from 300 hp at 1,800 rpm to 450 hp at 2,000 rpm.

The TMD 102 is also based on the in-line, six-cylinder configuration. The TMD 102 offers 238 to 272 hp at speeds from 1,800 to 2,000 rpm.

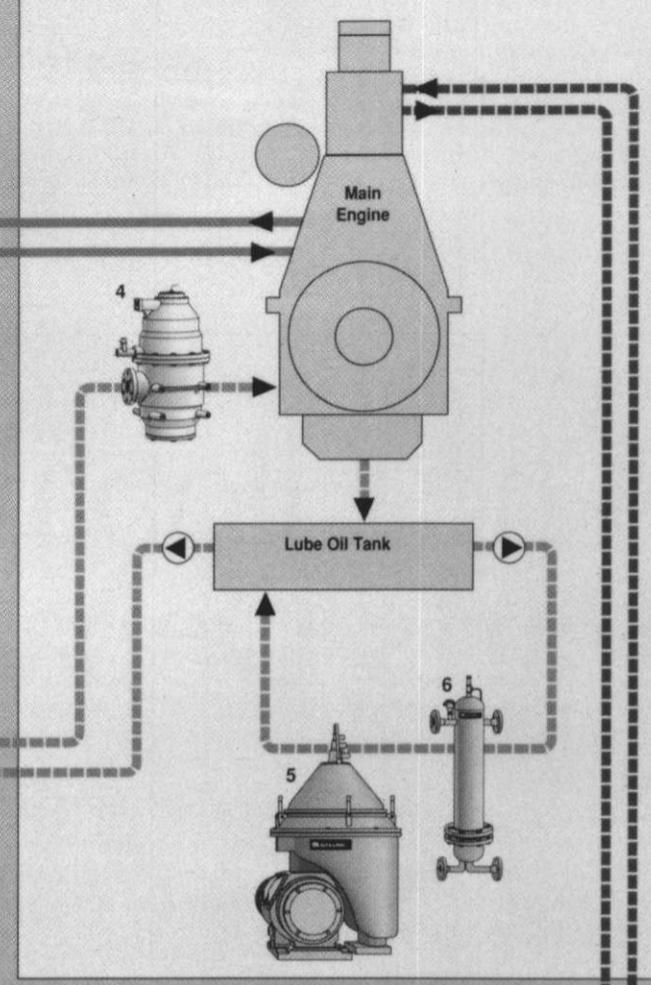
Other workboat engines from

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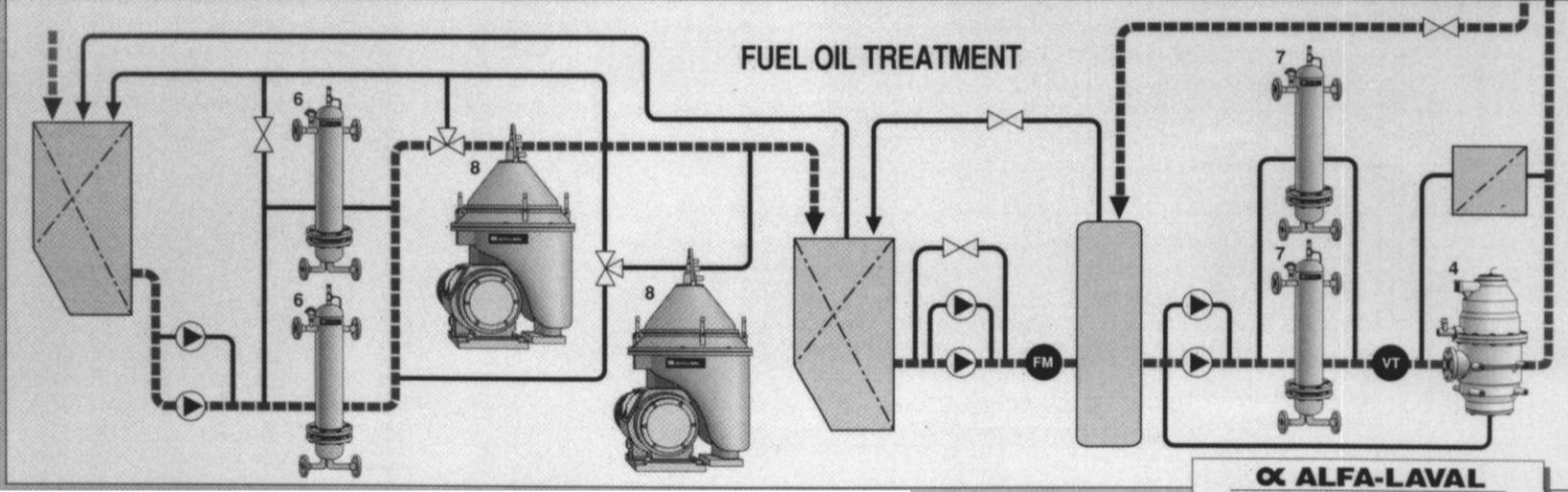


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Volvo Penta include: the TAMD 71 and TAMD 61, with power ratings as high as 357 hp; the TMD 31 and 41, with power output as high as 200 hp; and the smaller two-cylinder 2002 and three-cylinder 2003 models.

For free literature detailing Volvo Penta workboat engines,

Circle 42 on Reader Service Card

WARTSILA DIESEL

Wartsila Diesel North America, Inc., the U.S. subsidiary of the Wartsila Diesel Group, recently consolidated its operational functions for North America and the Caribbean in Chestertown, Md.

Eight regional sales and service facilities are located across the U.S.

With the expanding technical and marketing staff and the integration of Wartsila Diesel, Stork-Wartsila Diesel and SACM Diesel businesses, the company has made a strong commitment to the North America market.

In 1990, Wartsila Diesel North America, Inc., purchased the Power System Division of Morrison Knudsen, now MKW Power Systems, Inc. In addition to marketing

and servicing General Motors Corporation's EMD diesel engines, MKW Power Systems packages Wartsila Diesel engine systems, providing North America customers with U.S. engineered and installed components on fast turnaround schedules.

The Wartsila Diesel Group is a leading manufacturer of medium-speed engines, with power outputs up to 22,000 bhp and 16,000 kw. The Wartsila family of engines include: the Vasa 22, 32 and 46; the SACM Diesel UD 45, 33, 30, 25, 23, and 18; the Stork-Wartsila Diesel SW 280, TM 410 and 620; Wartsila Nohab 25; and the Wartsila Wichmann 28.

For free literature fully detailing the Wartsila Diesel engine family,

Circle 43 on Reader Service Card

WESTINGHOUSE DIESEL

Prompted by prospects presented by the Navy's Sealift program, Westinghouse, a leading supplier of advanced propulsion systems for the U.S. Navy, has teamed with New Sulzer Diesel Ltd., a leading supplier of medium-speed diesel engines for large ships, to provide diesel propulsion. Through its Westinghouse Marine Division, Westinghouse will supply low-speed RTA type and medium-speed ZA40S model diesel engines.

The ZA40S generates up to 19,000 bhp, satisfying high power concentration and minimum space requirements, and allows engineering flexibility through the easy integration of high- and low-power engine combinations. Equally important, individual Sulzer Z-type engine operating times exceed 98,000 hours.

With more than 300 ZA40S engines in operation or on order, this modern engine has proven itself to be rugged, highly reliable, and efficient. It provides long intervals between overhauls, long range endurance, true heavy fuel capability, and consistently low lubricating oil consumption.

More than 1,215 Sulzer RTA engines are in service or on order. These engines represent the latest in diesel engine technology, ensuring cost-effective propulsion for Navy and commercial ships.

The excellent performance of Sulzer low-speed RTA engines is the result of innovative, new piston ring and cylinder liner technology that ensures longer intervals between overhauls. In addition, this engine's low-speed, direct-drive configuration produces up to 62,400 bhp within an engine range of 54 to 196 rpm.

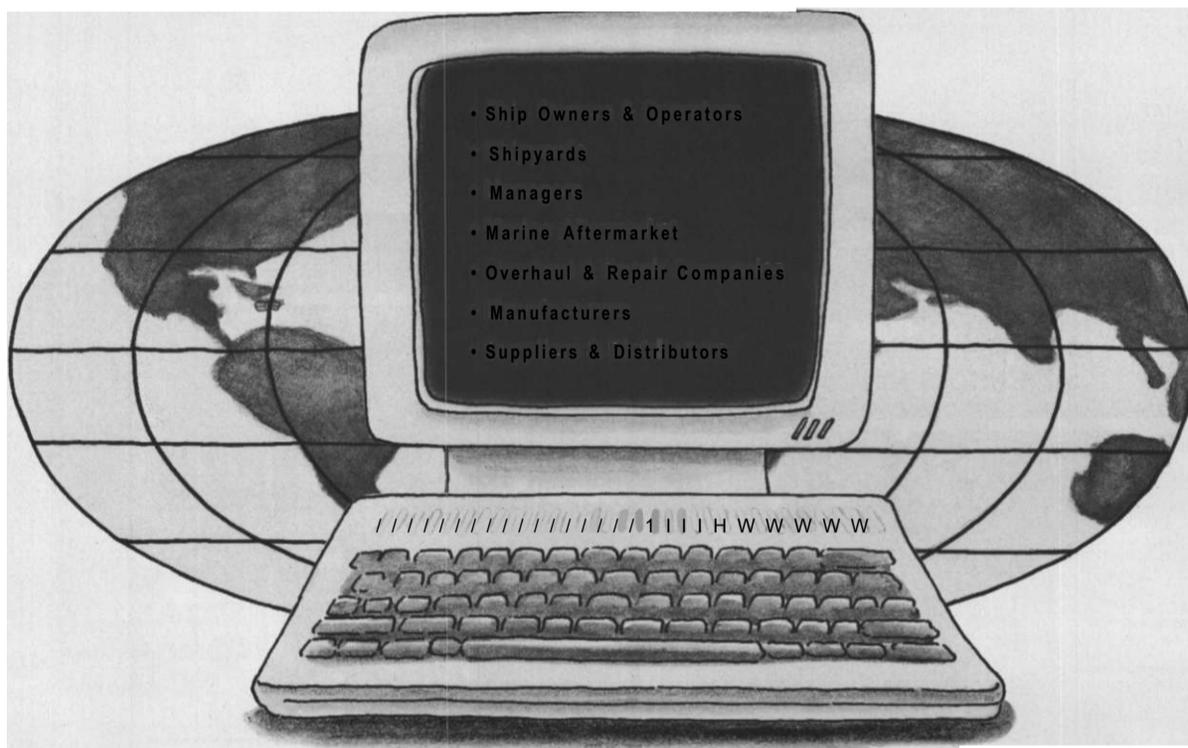
For free literature detailing the Westinghouse diesel engine program,

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For free literature detailing the services, as well as the complete line of diesels supplied by Stewart & Stevenson,

Circle 69 on Reader Service Card

CUMMINS

For over 70 years, Cummins Engine Company has been building marine engines. The Columbus, Ind., company's main propulsion engine output range stretches from 76 bhp to 1,385 bhp.

One of the company's most popular models is the compact, lightweight B Series. The series includes four- and six-cylinder models with displacements of 3.9 and 5.9 liters. The company's new 300-hp

six-cylinder 6BTA59-M2 extends the top of the line of the B Series and provides excellent power-to-weight ratio. Some of the features of the B Series include: a watercooled Holset turbocharger and fully cast watercooled exhaust manifold; single-piece cross cylinder head design, which allows close cylinder spacing to minimize overall engine length while maximizing structural strength and ease of service; engine heat exchanger; gear-driven seawater pump; and mounted expansion

To find out more about John Deere diesel engines for marine applications, contact one of our authorized distributors listed below;

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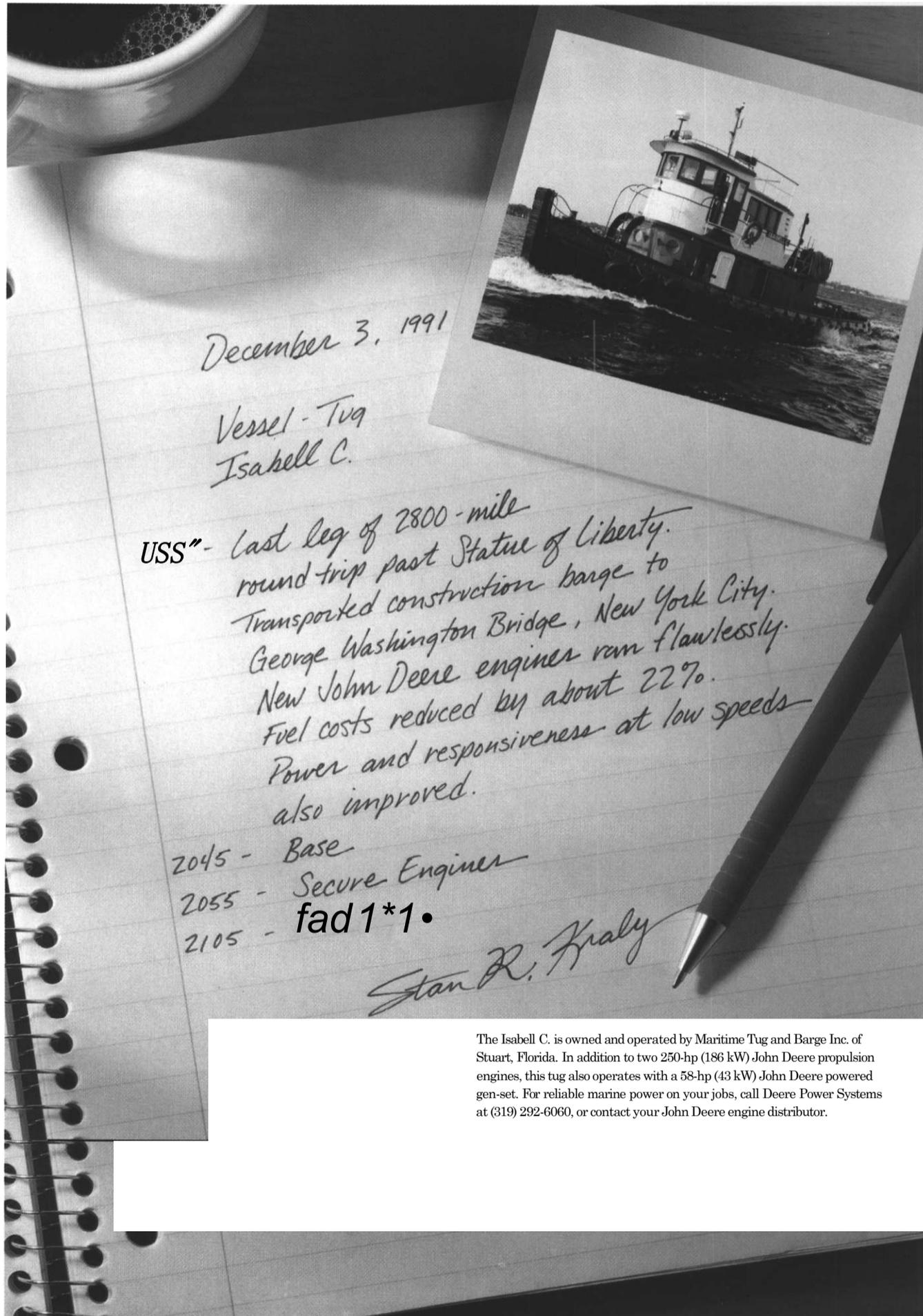
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Over 5,600 Cummins distributors and dealers serving 153 countries provide sales and service support for Cummins diesels. This organization ensures the availability of service specialists and parts stock around the world.

For free literature detailing the full line of Cummins marine diesel engines,

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GMT

A substantial investment plan is being undertaken by Italian shipbuilder and diesel engine manufacturer Fincantieri at its Trieste facility in the areas of design, production and research and development. Fincantieri, which is a shareholder of New Sulzer Diesel, builds Sulzer RTA low-speed and ZA40S medium-speed diesels at the plant, as well as its own Grandi Motori Trieste

(GMT) model medium-speed engines. Fincantieri has focused its development plans on upgrading the power of the GMT 550BL and GMT A320 models. The GMT A320 is expected to be upgraded from 500 bhp to 600 bhp by extending its stroke from 360 mm to 390 mm.

Also part of the Fincantieri Group is high-speed diesel manufacturer Isotta Fraschini. Suitable for propulsion aboard corvettes, fast patrol craft, harbor tugs, fireboats, or other

similar vessels, Isotta Fraschini's ID 36 is a compact high-speed diesel with excellent power-to-weight characteristics.

A pair of low-magnetic model ID36-AM diesels provide propulsion power aboard the U.S. Navy's Coastal Minehunter (MHC) Class.

For free literature detailing the full line of marine diesel engines offered by Fincantieri,

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Great Lakes Towing Overhauls Army Tug, Expands Yard Facilities

The Shipyard Division of The Great Lakes Towing Company, Cleveland, Ohio, recently completed the drydocking and overhaul of the U.S. Army Corps of Engineers tug Forney.

The work was completed on schedule and included tank and underwater hull inspection/preservation, using the yard's 250-ton-capacity floating drydock, and topside modifications to the galley, and engine control system.

The company's Shipyard Division has established a reputation for the quality and competitive repair and overhaul of Coast Guard, Corps of Engineers and commercial vessels. Originally established to maintain the company's fleet of 50 tugboats, the shipyard now services all types of vessels. Future work includes the drydocking and repair of the CG's 180-foot cutter Bramble and two sightseeing boats.



The Army Corps of Engineers tug Forney, recently drydocked and overhauled by The Great Lakes Towing Company's Shipyard Division.

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The division's facilities will expand with the December 31, 1992 acquisition of the present Merce-East Shipyard site and former G&W Industries facility located on the Cuyahoga River. The new facilities will enable the company to perform topside winter work and to berth larger vessels, including lake carriers, for major steel fabrication work.

For additional information about Great Lakes Towing and the services offered by its Shipyard Division,

Circle 13 on Reader Service Card

Circle 261 on Reader Service Card

FMC Seeks Comments On Exempting Military Rates From '84 Ship Act

The Federal Maritime Commission (FMC) has issued an Advance Notice of Proposed Rulemaking (ANPRM) to solicit comments from the public regarding whether military rates should be exempted or made fully subject to the filing requirements of section 8, and possibly section 10, of the 1984 Shipping Act.

If the FMC's treatment of military rates is seen as making meaningful comparisons difficult or unfair to MSC, U.S.-flag carriers or any other party, the commission could remove format exemptions presently enjoyed by U.S.-flag operators filing military rates and require such rates to be published in exactly the same manner and format as commercial rates, e.g., tariffs and service contracts.

However, if military rates do not present such difficulties, a full or partial exemption from the 1984 Shipping Act requirements may be warranted. The exemption could be limited to the tariff filing requirements of section 8, 46 U.S.C. app. 1707, or extended to the provisions of section 10 as well.

Comments are due 45 days after the June 3, 1992 publication of the ANPRM in the Federal Register.

For further information contact: **Robert D. Bourgois**, General Counsel, Federal Maritime Commission, 1100 L St., N.W. Washington, D.C. 20573. (202) 523-5740.

French Yard Unveils High-Speed Vessel For Passengers/Cars

The Design and Engineering Department of French shipbuilder Ateliers et Chantiers du Havre (ACH) recently unveiled a long, highly streamlined single-hull project vessel with small lateral wings designed for passenger transport with or without vehicles.

The yard, which is currently building the Club Med 2 for Club Med, said the proposed range of vessels will be capable of carrying between 50 and 2,200 passengers and 20 to 550 cars, with a waterline length ranging from 25 to 150 meters (82-492 feet). At fully loaded cruising speeds, ACH claims the vessel will be able to obtain speeds of 50 knots, a sharp contrast with current car-ferry speeds of 20 to 22 knots.

The research and test campaign were partially backed by the French Ministry of Industry.

For further information on ACH,

Circle 59 on Reader Service Card

Meyer Werft Cancels Plan To Build New Yard In Former East Germany

Amid pressure from its fellow German and European competitors, shipbuilder Meyer Werft of Papenburg recently announced it

had canceled plans to build a modern shipyard on an island in the former East Germany. Meyer Werft had been pursuing a plan to build a yard in the industrial district of the harbor of Mukran on the island of Rugen since early 1990.

The cancellation follows a recent preliminary decision by the EC to reduce shipyard capacity in Mecklenburg-Vorpommern.

Meyer Werft has been active in the revitalization of several former East German yards, including Rostock, Stralsund, Rechlin and Wolgast. For example, through its active and successful support to Volkswerft, Stralsund, especially in the way of new orders, Meyer Werft has been able to secure employment at the yard.

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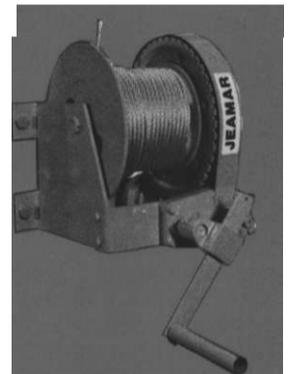
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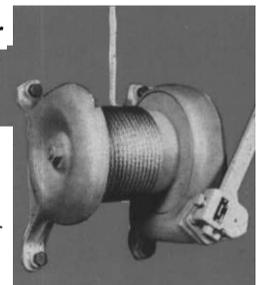


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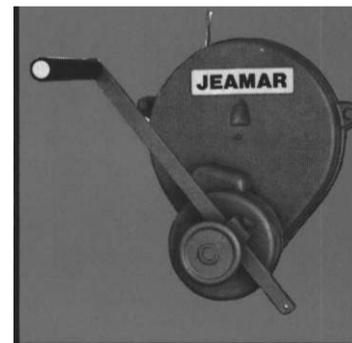
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- Three models: 550 to 1650 lbs



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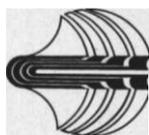
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PROPELLER SHAFT SEALS Acquisition Announced

July 1, 1992

Worldwide Edition

John Crane Marine International is pleased to announce that it has acquired the Marine Seals portion of the Waukesha Bearings Company. The new U.S. company will be known as John Crane Marine USA and will integrate the Waukesha seals operation into its headquarters by August 1, 1992.

The combined capabilities will provide greater advantages to both our naval and commercial marine customer base. JCM USA can offer shaft seal designs

for water, grease, and oil lubricated systems for propulsion shaft, rudder stock, bulkhead, fin stabilizer and bow thruster applications. Sizes range from 2"-60" diameters with non-split, partially split and fully split designs.

In addition, JCM USA can offer special non-pollution configurations to help meet the requirements outlined in the Oil Pollution Act of 1990.

For additional information, please contact us at:

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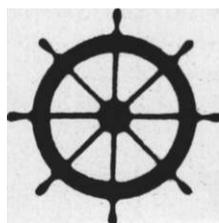
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Anthony Del Gavio
President

Cat Pumps Introduces Corrosion Resistant Ceramic Plunger Pump

Cat Pumps, Minneapolis, Minn., has expanded its plunger pump series with the addition of the new 25 Frame Model 2530 and Model 2537, for industrial applications needing a powerful but compact unit.

This new 25 Frame series delivers 20 GPM up to 1000 PSI and is available in both the fresh water and corrosion resistant construction. Special features that provide the pump with low weight and high heat, shock and wear resistance include: ground solid ceramic plungers; teflon composition seals; aluminum crankcases; and Zamak connecting rods, a self-lubricating bearing material.

Cat's corrosion resistant pumps can be used for demanding applications such as reverse osmosis, saltwater re-injection, central cleaning systems, sanitizing, mold and conveyor cleaning and paint removal. The Cat Pump can be serviced on location with standard seal and valve kits and common tools.

For free literature about Cat's corrosion resistant pumps,

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FMC Seeks Comments On Exempting Military Rates From '84 Ship Act

The Federal Maritime Commission (FMC) has issued an Advance Notice of Proposed Rulemaking (ANPRM) to solicit comments from the public regarding whether military rates should be exempted or made fully subject to the filing requirements of section 8, and possibly section 10, of the 1984 Shipping Act.

If the FMC's treatment of military rates is seen as making meaningful comparisons difficult or unfair to MSC, U.S.-flag carriers or any other party, the commission could remove format exemptions presently enjoyed by U.S.-flag operators filing military rates and require such rates to be published in exactly the same manner and format as commercial rates, e.g., tariffs and service contracts.

However, if military rates do not present such difficulties, a full or partial exemption from the 1984 Shipping Act requirements may be warranted. The exemption could be limited to the tariff filing requirements of section 8, 46 U.S.C. app. 1707, or extended to the provisions of section 10 as well.

Comments are due 45 days after the June 3, 1992 publication of the ANPRM in the Federal Register.

For further information contact: **Robert D. Bourgoïn**, General Counsel, Federal Maritime Commission, 1100 L St., N.W. Washington, D.C. 20573. (202) 523-5740.

French Yard Unveils High-Speed Vessel For Passengers/Cars

The Design and Engineering Department of French shipbuilder Ateliers et Chantiers du Havre (ACH) recently unveiled a long, highly streamlined single-hull project vessel with small lateral wings designed for passenger transport with or without vehicles.

The yard, which is currently building the Club Med 2 for Club Med, said the proposed range of vessels will be capable of carrying between 50 and 2,200 passengers and 20 to 550 cars, with a waterline length ranging from 25 to 150 meters (82-492 feet). At fully loaded cruising speeds, ACH claims the vessel will be able to obtain speeds of 50 knots, a sharp contrast with current ferry speeds of 20 to 22 knots.

The research and test campaign were partially backed by the French Ministry of Industry.

For further information on ACH,

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Meyer Werft Cancels Plan To Build New Yard In Former East Germany

Amid pressure from its fellow German and European competitors, shipbuilder Meyer Werft of Papenburg recently announced it

had canceled plans to build a modern shipyard on an island in the former East Germany. Meyer Werft had been pursuing a plan to build a yard in the industrial district of the harbor of Mukran on the island of Rugen since early 1990.

The cancellation follows a recent preliminary decision by the EC to reduce shipyard capacity in Mecklenburg-Vorpommern.

Meyer Werft has been active in the revitalization of several former East German yards, including Rostock, Stralsund, Rechlin and Wolgast. For example, through its active and successful support to Volkswerft, Stralsund, especially in the way of new orders, Meyer Werft has been able to secure employment at the yard.

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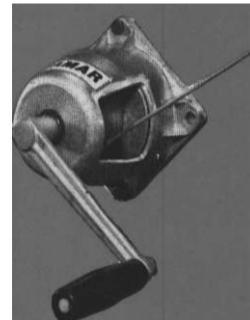
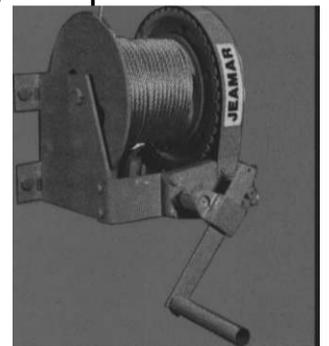
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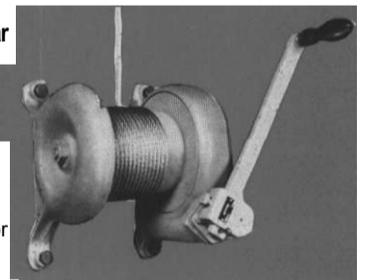


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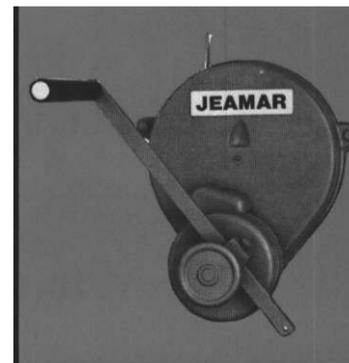
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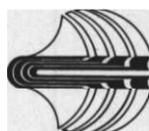
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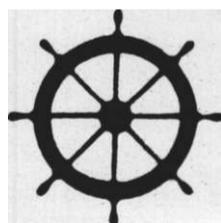
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The fishing excursion boat Lady Francis.

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With her three Lugger 6140AL diesel engines generating a top speed of 22.5 knots, the new 103-foot, 150-passenger party fishing boat Lady Frances "really moves," according to **Frank and Christine Blount** of Gail Frances Charters.

The boat was built by Lydia Yachts, Stuart, Fla., and is powered by three 550-hp Lugger 6140AL diesels. The Lady Francis is scheduled

to be operated out of Point Judith, R.I.

On her delivery trip from Florida, the Lady Francis cruised at 17.2 knots at 1,650 rpm and the three Luggers and two generator sets used an average of 32 gallons of fuel per hour.

For its fishing customers, the Lady Frances has been equipped with heated hand rails, state-of-the-

art sound systems, 2 Northern Lights M964 30kW generators and an array of fish finding electronics, including an American Pioneer Dual Scan II sonar and 2 Furuno FCV271 sounders.

"In our area the charter boats have to go farther and get out and back faster than in times past. The Lady Frances is designed for that kind of service," says **Jay Gallup** of Rhode Island Engine, a Lugger dealer in Narragansett, R.I.

For free literature about Alaska Diesel Electric's Lugger 6140AL diesel engine,

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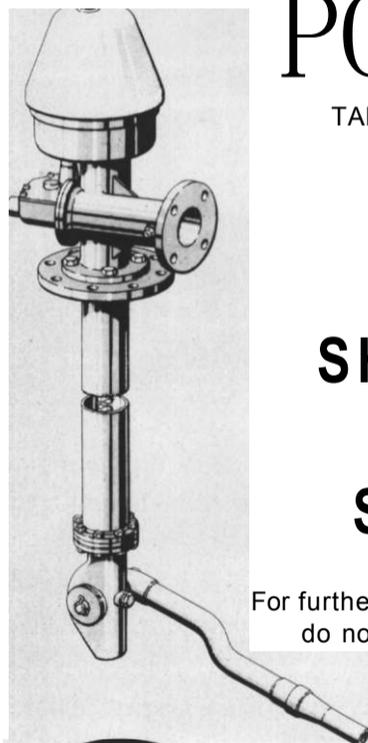
CG Says New Regulations Will Remove Substandard Tankers And Operators

Rear Adm. **A.E. Henn**, chief of the Coast Guard's office of marine safety and environmental protection, recently told an oil industry conference that agency and international regulations will eliminate poorly maintained oil tankers and their operators from business if they do not improve their ships and operations.

Admiral **Henn** also implicated some national registries, classification societies and marine insurers that continue to certify and insure unsafe ships. Regarding ship construction, tanker operators were encouraged to pay closer attention to the intended trade and service of new vessels. "We can't let the shipyards optimize the designs so they fail in the shortest period of time," Admiral **Henn** said.

Classification societies have warned that some shipyards are cutting costs by reducing the amount of steel used in new construction, resulting in shortened vessel life spans.

Oil executives attending the conference said they generally agreed with Admiral **Henn's** remarks.



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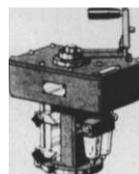


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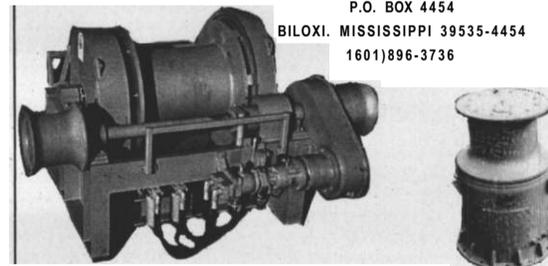
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Future Repair & Modernization Of U.S. Navy Ships

\$5 Billion Annual Market For Shipyards

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

Navy ship repair reaches deep into U.S. industry. Forty-five U.S. commercial shipyards, eight naval shipyards and two Navy-owned ship repair facilities are involved in this business sector. However, these are only the tip of the iceberg. Thousands of manufacturers throughout the country supply replacement equipment and service shipboard systems. Despite future down sizing of the U.S. Navy fleet, repair and modernization of Navy ships will continue to provide a substantial business base for a diversified mix of companies.

Spending Trends For Navy Ship Repair

Expenditures for maintenance and repair of Navy ships have risen dramatically over the past 18 years. As indicated in Exhibit 1, expenditures have quadrupled between 1975 and 1992. Total expenditures peaked in 1985 at just under \$4.8 billion. However, in terms of maintenance expenditures per ship, 1992 is a peak year.

Additionally, the Navy has been



A major overhaul is planned for the aircraft carrier John F. Kennedy (CV-67) in Fiscal Year 1993.
Photo: Moran Towing.

spending between \$100 million to \$200 million annually on maintenance and modernization of Naval reserve ships. The Military Sealift Command (MSC) has recently been

spending about \$175 million to \$200 million annually on ship maintenance and repair of nucleus fleet ships. The Maritime Administration budget for RRF ship maintenance

has been climbing—reaching \$172 million in 1991, \$234 million in 1992. Funding trends are shown in Exhibit 2.

Mix Of Work

Shown in Exhibit 3 is the number of overhauls and short term maintenance availabilities scheduled for active fleet ships over the past 10 years. The number of overhauls has fallen dramatically during this period—reflecting the change in maintenance strategy which emphasizes frequent short duration availabilities in place of periodic lengthy overhauls.

For many years, Navy maintenance practice had been to schedule periodic, lengthy ship overhauls during which repairs and planned alterations were performed. A typical cycle allowed approximately 36 months between major overhauls—with the overhaul requiring 8 to 12 months to complete.

This traditional overhaul practice has been largely discontinued—principally to minimize ship out-of-

Exhibit 1-Trend in Active Navy Fleet Ship Maintenance Expenditures, 1975-92

Fiscal Year	Total Maintenance Expenditures (in \$ millions)	No. of Active Fleet Ships	Maintenance Expenditure per Ship (in \$ thousands)
1975	1140.5	496	2299
1976	1490.5	484	3080
1977	1903.4	477	3990
1978	2563.5	468	5478
1979	2508.9	473	5304
1980	2642.5	479	5517
1981	3195.0	491	6507
1982	3632.3	513	8189
1983	4201.2	513	8189
1984	4214.7	523	8059
1985	4779.6	542	8818
1986	4179.7	555	7531
1987	4244.4	568	7473
1988	3551.1	565	6285
1989	3454.7	566	6104
1990	3654.0	545	6705
1991	3861.2	526	7340
1992	4392.7	473	9286

Note: Figures in this exhibit do not include expenditures for ship modernization.
Source: IMA Associates, "Outlook for Repair and Modernization of U.S. Navy Ships."

Exhibit 2-Trend in Expenditures For Maintenance & Modernization of Naval Reserve, MSC & RRF Ships
1983-1991 (in \$ millions)

Fiscal Year	Naval Reserve Ships	MSC Ships	RRF Ships
1983	100.3	240.2	NA
1984	97.4	179.0	NA
1985	123.6	319.1	NA
1986	127.9	164.4	NA
1987	148.3	221.7	NA
1988	157.3	205.7	74.0
1989	170.1	173.2	75.0
1990	151.8	162.7	85.0
1991	199.2	173.5	172.0

Note: (1) MSC expenditures include maintenance and repair of nucleus fleet ships. Data may not be comparable year to year. (2) RRF expenditures included in Navy budget prior to 1989.
Source: IMA Associates, "Outlook for Repair and Modernization of U.S. Navy Ships."

service time. In its place has been the introduction of three maintenance programs utilizing frequent short term availabilities: engineered operating cycle, progressive maintenance and phased maintenance. The basic pattern for each of these maintenance programs is illustrated in

Exhibit 4.

As a result of these new maintenance programs, the percentage of scheduled maintenance being performed during short term availabilities has dramatically increased. Ten years ago, 78 percent of ship maintenance was being performed as part

of regular overhauls—and only 22 percent during short term availabilities. Currently, only 32 percent of scheduled maintenance is being performed during regular overhauls. The remaining 68 percent is being scheduled during short term availabilities.

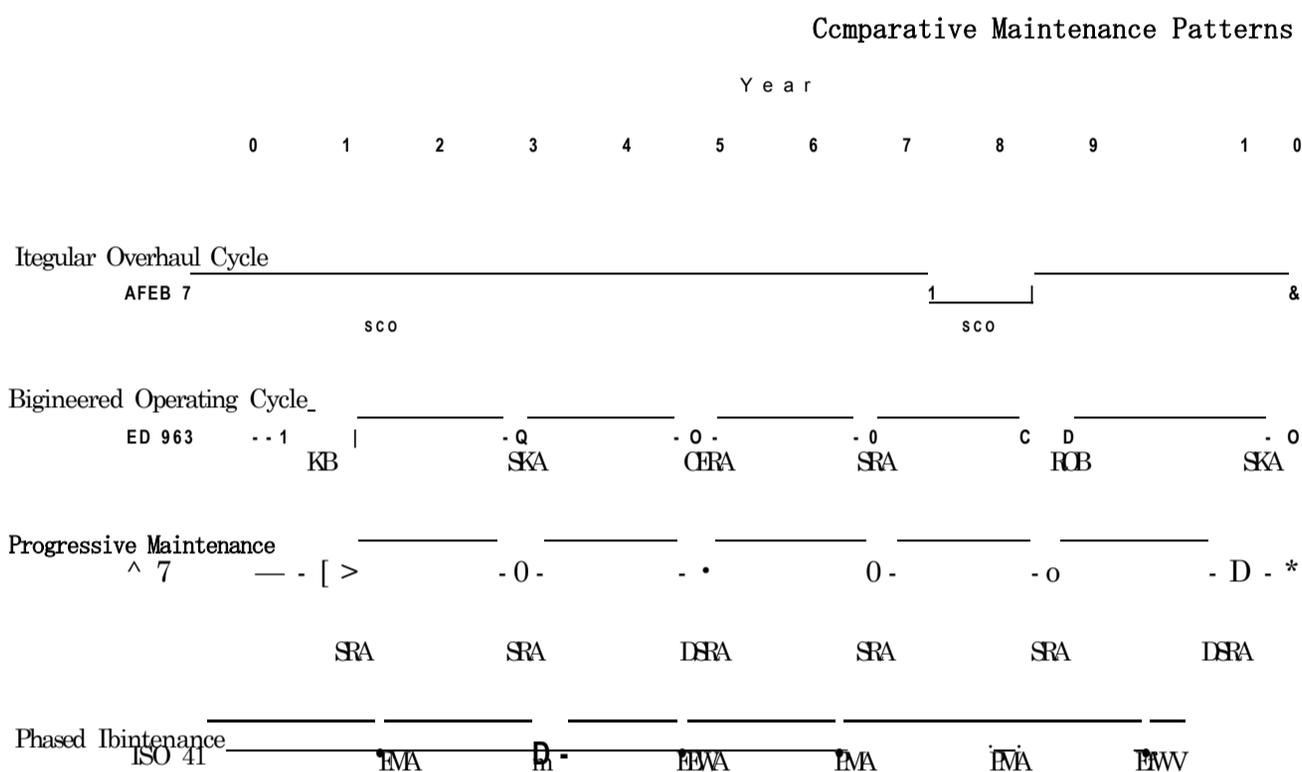
Distribution Of Navy Repair Work

Commercial yards have performed more than 60 percent of maintenance availabilities over the past six years. Of the 1,261 scheduled maintenance availabilities performed between FY 1985 and 1990, 799 (63 percent) were contracted to commercial shipyards. The eight naval shipyards performed 373 availabilities (30 percent) and 89 (7 percent) were performed in the Yokosuka, Guam and Subic ship repair facilities. Details are shown in Exhibit 5.

But Navy yards have performed the complex work. Virtually all of the submarine and nuclear surface combatant overhauls are assigned to naval shipyards. These are the big ticket jobs. Commercial shipyard get to work on conventionally powered surface ships. However, even there they find themselves competing with naval shipyard for the more attractive surface combatant overhauls. They also have competition from the Navy-owned ship repair facilities for work on amphibious, auxiliary and support ships.

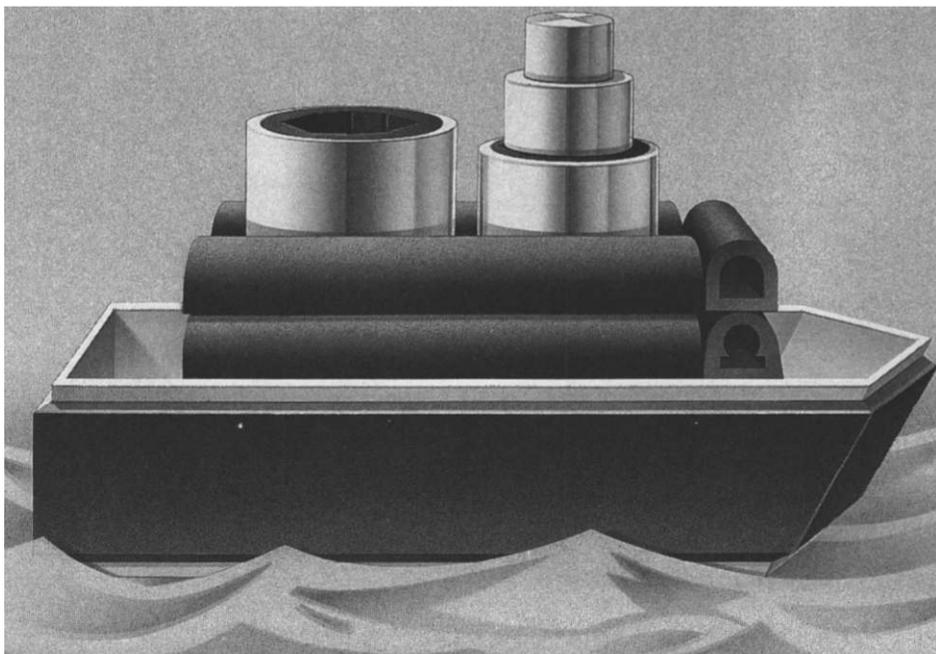
Fifteen shipyards performed 57 percent of the short term availabilities and 65 percent of the long term availabilities of large surface ships over the past six years. Small surface ships (e.g., minesweepers, rescue ships) and submarines are excluded from this calculation. Southwest Marine had the leading market share in short term availabilities.

Exhibit 4-Illustrative Maintenance Schedules for Navy Ships



Source: IMA Associates, "Maintenance, Repair & Modernization of U.S. Navy Ships."

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Exhibit 6--Major Yards Repairing Large Surface Ships, 1985-90 Short Term Availabilities

Company	# of jobs	% Market Share
Southwest Marine	89	11
Yokosuka SRF	53	7
Cont. Maritime	51	6
Norshipco	46	6
Metro Machine	44	6
Norfolk NSY	44	6
Jonathan	42	5
NASSCO	31	4
Atlantic Marine/DD	28	4
Charleston NSY	27	3
Other	337	43
Total-	792	100
Long Term Availabilities		
Company	# of jobs	% Market Share
Philadelphia NSY	12	9
Long Beach NSY	11	8
Metro Machine	10	7
NASSCO	10	7
Norshipco	9	7
Southwest Marine	9	7
Norfolk NSY	8	6
Ingalls	7	5
Todd	7	5
Avondale	6	4
Other	48	35
Total-	137	100

Philadelphia Naval Shipyard performed the largest number of overhauls and other long term availabilities. Interestingly, the Navy-owned repair facility in Yokosuka was the second largest performer of short term availabilities. Details are shown in Exhibit 6.

IMA Associates is about to publish a new in-depth analysis of this business sector. The new 200+ page report—to be available in July 1992—provides a forecast of business opportunities and assesses market share of the current players. To order a copy of "Outlook for Repair and Modernization of U.S. Navy Ships" (Report No. 7121), available at a cost of \$575, contact: IMA Associates, Inc., 600 New Hampshire Avenue, NW, Suite 140, Washington, D.C. 20037; telephone: (202) 333-8501; or fax: (202) 333-8504.

Fiscal Year	Overhauls	SRAs	PMAs	Total
1983	59	72	8	139
1984	53	88	10	151
1985	55	106	17	178
1986	33	99	31	163
1987	39	108	54	201
1988	22	87	64	173
1989	23	98	69	190
1990	19	100	55	174
1991	14	72	60	146
1992	14	96	72	182

Source: IMA Associates "Outlook for Repair and Modernization of U.S. Navy Ships."

	Commercial Yards No. of jobs	Naval Yards No. of Jobs	Naval Repair Yards No. of jobs	Total No. of jobs
SUBMARINES				
Overhauls	1 (1%)	66 (99%)		67 (100%)
Short term availabilities	33 (20%)	128 (80%)		161 (100%)
NUC. POWERED SURF. COMBATANTS				
Overhauls	1 (17%)	5 (83%)		6 (100%)
Short term availabilities	12 (35%)	22 (65%)		34 (100%)
CONV. POWERED SURF. COMBATANTS				
Overhauls	59 (66%)	29 (32%)	2 (2%)	90 (100%)
Short term availabilities	333 (73%)	94 (21%)	28 (6%)	455 (100%)
AMPHIB. & COMMAND SHIPS				
Overhauls	19 (73%)	7 (27%)		26 (100%)
Short term availabilities	110 (73%)	10 (7%)	31 (21%)	151 (100%)
AUX. & SUPPORT SHIPS				
Overhauls	28 (65%)	5 (12%)	10 (23%)	43 (100%)
Short term availabilities	148 (86%)	7 (4%)	18 (10%)	173 (100%)
MINESWEEPERS				
Overhauls	20 (100%)			20 (100%)
Short term availabilities	35 (100%)			35 (100%)

Source: IMA Associates, "Maintenance, Repair & Modernization of U.S. Navy Ships."
Note: Percentage of market share shown in parentheses.

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Robotic Vision Wins \$1.45 Million Navy Prop Measuring System Order

A \$1.45 million contract to provide an automated propeller optical measurement system was recently awarded to Robotic Vision Systems, Hauppauge, N.Y., by the Puget Sound Naval Shipyard.

Robotic Vision designs and manufactures three-dimensional vision-based inspection and measurement products.

House Allocates \$90 Million For Navy Theater Missile Defense

At least \$90 million has been appropriated in the strategic defense initiative's fiscal year 1993 funding for the Navy's theater missile defense (TMD) research program.

The House Armed Services Committee has directed the money to be used for the "development of naval theater missile defense capabilities, including modifications to the Aegis radar and enhancements to the Standard Missile Interceptor."

The Navy's TMD system would have the potential to provide protection from ballistic missiles to both the fleet and to coastal population centers on land. With adequate funding the service believes that a limited TMD capability could be

available in the fleet by the late 1990s.

ECO Delivers Two PC Ship Simulators To Navy

Two desktop computer navigation and shiphandling simulators were recently delivered to the Headquarters, U.S. Atlantic Fleet, Norfolk, Va., by Engineering Computer Optecnomics, Inc. (ECO), Annapolis, Md.

The Captains I desktop simulators will enhance the training of U.S. Navy personnel in shiphandling, navigation and operations in restricted waters under any wind or current conditions.

The Captains I simulator consists of a computer with monitor and a miniature bridge console. The software provided contains mathematical models for several types of ships and for various ports. The highly flexible Captains I simulator can be used for either training on shore or aboard ship, to increase shiphandling training opportunities for off-section bridge personnel. The Captains I system provided to the Navy is one of a series of shipboard simulators. Captains shiphandling and navigation simulators are available for any ship type operating in any port or geographic area.

For free information about the Captains shiphandling simulators from ECO, Inc.,

G. Marine Wins 2 CG Drydocking Contracts Worth \$1.33 Million

Two drydocking availabilities contracts on the High Endurance Cutters Dallas (WHEC-716) and Gallatin (WHEC-721) were recently awarded by the U.S. Coast Guard Maintenance and Logistics Command Atlantic to G. Marine Diesel Corporation's Shipyard Division in Brooklyn, N.Y.



The USCGC Gallatin (WHEC-721) in drydock at G. Marine Diesel's shipyard in Brooklyn.

Major repairs under Dallas's \$640,000 contract will include: sonar dome replacement, distilling plant overhaul, weight handling gear overhaul and an updated torpedo handling system.

The Gallatin contract, for \$690,000, includes: gas turbine overhauls, bowthruster and rudder overhauls and topside preservation work.

Proposed Bill Would Prevent Owners From Abandoning Barges

Rep. W. J. Tauzin (D-La.), chairman of the House Subcommittee on Coast Guard and Navigation, is introducing a bill to Congress that would prohibit the abandonment of barges in the nation's waterways.

The measure would fine barge owners \$500 a day for abandoning a barge, which is defined as mooring, abandoning or stranding a barge of over 300 gt for more than 45 days in non-approved areas. After 45 days a barge would be declared abandoned and subject to removal, which would be financed from the Oil Spill Liability Trust Fund established under the Oil Pollution Act of 1990.

The Tauzin bill would also require all undocumented barges over 300 gt and operating in U.S. waters to be numbered so that their owners could be more easily traced.

\$8 Million Contract To Raytheon To Supply Radar Upgrade Kits

The Equipment Division of Raytheon Co., Wayland, Mass., has been awarded an \$8 million contract by the Navy for the development of two upgrade kits for AN/SPS-49(V) radar. NAVSEA awarded the contract (N00024-92-C-5627).

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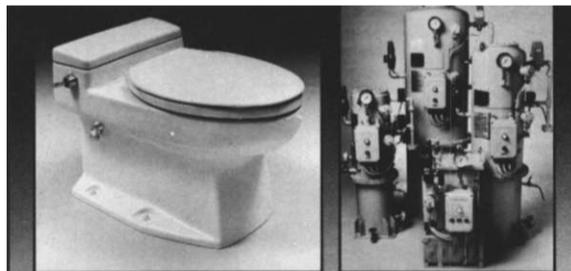
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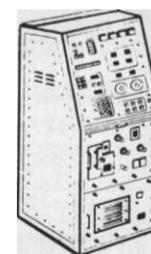
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Eighth LSD Class Ship Commissioned At Avondale

The USS Ashland (LSD-48), the Navy's eighth ship of the Whidbey Island (LSD-41) Class, was recently commissioned at Avondale Industries, Inc., Shipyards Division, Avondale, La.

The principle commissioning address was delivered by Rear Adm. **John B. LaPlante**, Vice Director for Logistics on the Joint Staff. Other speakers at the ceremony included Rear Adm. **Millard S. Firebaugh**, Deputy Commander for Ship Design and Engineering, NAVSEA; Rear Adm. **Andrew M. Granuzzo**, Commander, Amphibious Group Two; and **Edmund C. Mortimer**, Avondale Industries vice president and manager of the Shipyards Division.

The USS Ashland is the fifth of the LSD-41 Class Dock Landing

Ships delivered to the Navy by Avondale Shipyards of New Orleans. The first ships of the new class, the LSD Cargo Variant (CV), are currently under construction at Avondale.

Ashland takes its name from the Kentucky home of Henry Clay and is the second ship in the U.S. Navy to bear this name. She will be homeported in Little Creek, Va.

In other company news, Avondale was recently recognized as one of the safest shipyards in the U.S. Avondale has been awarded, for the second consecutive term, the OSHA Star Award, and is the only shipyard in the country that is involved in the OSHA's Voluntary Protection Program.

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The USS Ashland (LSD-48) in the Gulf of Mexico, following her commissioning at Avondale Industries.

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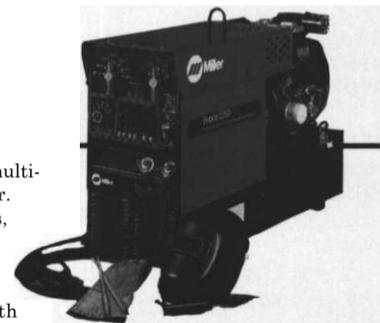
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ANNUAL GUIDE TO FUELS and LUBES

To obtain the necessary improvements that will ensure the commercial success of the newest generation of high-output engines, additives must be used in lubricants. And although the use of additives in internal combustion engine lubricating oils is nothing new, having begun over 70 years ago, recent advancements in organic chemistry have led to excellent results with new additives.

Some additives take the form of complex compounds of sulfur, phosphorus or a combination, or fall into a group called antioxidants. The use of various additives reduces organic acids, sludge and the breakdown of crankcase lubricating oil due to oxidation, carbon build-up, and component wear, all of which can hurt engine performance, increase the risk of mechanical failure and most importantly increase maintenance costs.

Besides newly developed additives for marine lubricants, other companies are offering special treatments for fuels which improve combustion, reduce deposits, or kill fuel-contaminating microbes.

The following article is based on the results of a brief survey of many of the leading suppliers of marine lubricants and fuel additives conducted by the editors of MARITIME REPORTER & ENGINEERING NEWS. Further information, including specification sheets, technical and literature, is available on any of the products reviewed in this article. To obtain free literature, circle the appropriate Reader Service Number on the post-paid Reader

Service Card bound into the back of this issue.

CASTROL MARINE OILS

The Castrol Company was a pioneer in the critical area of cylinder lubrication of slow-speed crosshead engines. Because uprated crosshead engines burn more fuel per cylinder unit volume and have a higher tendency to convert the fuel's sulfur into its acid component, Castrol engineers addressed the alkalinity of the cylinder oil as measured by Total Base Number (TBN). Early in 1989, the company launched its unique Castrol Marine Cyltech 80. This highly successful crosshead engine cylinder oil has a TBN of 80 and contains a unique antiwear additive combination.

The owner can either use Cyltech 80 at the same feed rate as a conventional product and achieve savings through greatly reduced wear of components or he can reduce the feed rate of Cyltech 80 by at least 15 percent and achieve direct cost savings on his cylinder oil bill while still maintaining or improving the wear profile of cylinder liners and pistons.

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In an effort to maintain a leading position in the marine lubrication technology field, Castrol has extended its R&D program to investigate the effects on lubrication of high surface temperatures on cylinder liners and piston rings.

For further information on Castrol marine lubricants,

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CHEVRON USA

Chevron USA markets a variety of premium lubricants for marine applications in the United States including:

Chevron Marine Engine Oils Delo 477 (SAE 20W-40)—recommended for use in main power, medium-speed two- and four-cycle diesel engines such as those used in towboats, tugs, workboats and dredges;

Chevron Delo Heavy Duty Motor Oils (SAE 10W, 20, 30, 40, 50)—recommended for supercharged marine diesel engines; meets the requirements of the great majority of high-speed diesel engine manufacturers, both domestic and international;

Chevron Marine Engine Oils Delo 1000, 2000, 3000 Marine (SAE 30 and 40)—recommended for a wide variety of medium-speed trunk piston engines including the latest design high output engines;

Chevron Delo 100 Motor Oils (SAE 10W, 20, 30, 40, 50)—recommended for use in two- and four-

stroke cycle diesel and four-stroke cycle gasoline engines;

Chevron Delo 300 Motor Oils (SAE 10W, 30, 40, 15W-40)—recommended for all heavy-duty and supercharged engines;

Chevron RPM Heavy Duty Motor Oils (SAE 10W, 30, 40, 50, 10W-30, 15W-40)—recommended for all heavy-duty and supercharged engines;

And Chevron Marine Engine Oil Symbol 9250 (SAE 40) can be used in any engine where U.S. mil spec MIL-L-9000H Symbol 9250 oil is required.

In addition to these products, Chevron USA produces a variety of lubricants and greases for marine applications.

For more information on Chevron marine lubricants and their specific applications,

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Amergize^R deposit modifier/combustion improver, contains ingredients which promote more complete combustion and also reduce deposits and corrosion in combustion spaces.

Drew's international network of service technicians provides added value to each chemical purchase through support programs. One such program is PACETM fuel evaluation which provides comprehensive analyses of the chemical and physical properties of bunker fuels, with follow-up recommendations to ship operators.

For free literature detailing Drew Ameroid Marine's fuel treatment products,

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EXXON

Exxon Company, U.S.A., markets several lines of quality marine lubricants. Exxon's marine lubricant line includes De-Mar 17, an LMOA Generation 5 heavy duty crankcase lubricant for both main and auxiliary diesel engines. Zinc-free, high-detergent De-Mar 17 has a 17 TBN and is non-corrosive to silver bearings. It is accepted by all the major marine engine manufacturers and has been proven in Caterpillar 3601 and Detroit Diesel 6V92T engine dynamometer tests.

The latest Exxon generation of marine diesel lubricants, the Exxmar line, exceeds the performance requirements of low- and medium-speed diesel engines under today's conditions and has more than an adequate margin for future needs over the next several years, according to Exxon.

Combined with excellent wear performance, its standards of cleanliness are high with good overall control of deposits, even when operating on higher viscosity lower-grade residual fuels. Lower TBN Exxmar products are specifically meant for use in earlier model diesel engines. The high load carrying capacity of the Alkaline crosshead system oil is also been proven as an asset for the more demanding power take-off (PTO) gear application.

Other marine lubricants offered by Exxon include: Spartan EP, a non-lead, extreme-pressure lubricant for enclosed gears and bearings operated under heavy load or shock load conditions; Spartan Synthetic EP, a high VI long-life extreme-pressure gear and bearing lubricant; Nuto H, an anti-wear hydraulic oil; 1209 Turbine Oil, a rust and oxidation inhibited anti-

wear marine turbine oil, MIL-L-17331-H approved; and Univis N, a line of high viscosity index anti-wear hydraulic oils.

For free literature detailing the Exxmar line of marine lubricants from Exxon,

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FERROUS

Ferrous Corporation, Bellevue, Wash., offers both fuel and lubricant additives for the marine market formulated to improve combustion or reduce corrosive wear. The additives include:

Gear-Saver lubricant additive improves the lubricating oil's viscosity index greatly reducing heat's harmful effects, and adds film strength for better lubricant surface retention. Ferrous reports that Gear-Saver extends the life of gear box and other lubricating systems through better cold start lubrication, reduced friction, lower operating temperatures and improved break-free surface lubrication throughout the system.

Sea-L-Saver lubricant additive is a premium quality lubricant that blends with all petroleum-based oils and fluids, improving efficiency and extending their operating life. It also extends the life of seals in stern tubes, bow thrusters and hydraulic systems.

Fuel-Guard microbiocide is blend of highly active antimicrobial compounds for the treatment of stored fuels. Readily soluble in all grades of fuel oil, Fuel-Guard is effective in reducing bacteria, fungi, and yeasts found in contaminated fuels.

BT-8 fuel stabilizer and sludge dispersant is formulated to improve the stability and burnability of fuels by reducing the formation of residues and sludges. BT-8 is non-metallic and completely ashless.

MP-4 combustion catalyst and ash modifier promotes rapid oxidation of fuels for more efficient combustion, and maintain exhaust valves and superheater tubes free of vanadium and sulfate deposits. Its is readily soluble in all grades of fuel oil and is intended for use in diesel engines and boilers.

For further information on Ferrous Corporation fuel and lubricant additives,

Circle 49 on Reader Service Card

HAMMONDS

Biobor^R JF is a concentrated liquid fuel additive from Hammonds Fuel Additives, Inc., used to eliminate Hydrocarbon Utilizing Microorganisms (HUM) or HUM-Bugs, in all hydrocarbon fuels such as aviation jet fuel, kerosene, No. 1 and 2 diesel fuels, home heating oil, marine diesel and bunker C fuels. Hammond claims that when used on a regular basis, Biobor JF, known as a microbiocide, will maintain fuel quality by not allowing microorganisms to grow.

"These HUM-Bugs are only microscopic in size, but they're causing serious harm," says **Walter Chatrand**, director of marketing for Hammonds Fuel Additives, Inc.

Even though there are more than 250 types of bacteria and fungi that can live in the water bottom of fuel tanks, only fewer than a dozen actually feed on the fuel and produce acid waste byproducts.

If left untreated, the small percentage of HUM-Bugs can damage diesel-powered ship fuel systems by clogging filters and lines. At the same time, the acid content of their waste byproducts corrodes fuel tanks, pipes, distorts, rubber hoses and seals, and increases wear on equipment by adding deposits to various engine components.

In various case studies, according to Hammonds, the small cost of using Biobor JF far outweighs the cost of repairing engines or related parts damage. At a recommended maintenance dosage of approximately one-half gallon of Biobor JF for every 5,000 gallon of fuel, the expense of using a biocide costs only half a cent for every gallon of fuel treated.

For free literature detailing Biobor JF from Hammonds,

Circle 28 on Reader Service Card

MOBIL OIL

Recent developments in cross-head engines have targeted increased power and fuel efficiency to reduce operating costs. This has resulted in higher temperatures and pressures in the cylinder, which reduce the lubricant's viscosity and increase the loads which it must withstand. Longer piston strokes have greatly increased the amount of surface to be protected and the amount of time the lubricant must withstand the severe cylinder temperatures and corrosive sulfur acids.

New Mobilgard 570 provides excellent protection through optimum viscosity at the higher operating temperatures and pressures of these modern engines. It employs new additives with substantially greater thermal stability and through new base oil refining technology, an optimum viscosity of 21 est at 100 degrees C is attained for best lubricant distribution and film retention.

In order to retain additive effectiveness at the higher temperatures of today's cylinders, Mobil chemists developed new, more thermally stable additives.

Other Mobil products include the more recently introduced Mobilgard 24 and 42 Series Oils for lubricating medium-speed trunk-piston marine diesels.

These new oils, said to offer longer engine life as measured by time before or between overhauls (TBO), are formulated to overcome a specific, persistent problem with heavy fuel-burning medium-speed marine diesels: contamination of lubricat-

ing oil by residual fuel. This usually occurs through inefficient injector operation, fuel pump leakage into the crankcase, or poor combustion.

The new Mobilgard 24 and 42 Series Oils are formulated to reduce the effects of fuel contamination. This results in improved crankshaft and camshaft cleanliness; reduced piston and piston ring deposits, improved piston cleanliness, and longer filter life. Purifier deposits are also reduced. These oils also offer better thermal stability, resistance to oxidation and overall engine cleanliness, compared with some other oils.

The Mobilgard 24 Series includes grade 30 and 40 oils with a TBN of 30. The Mobilgard 42 Series, also available in SAE 30 and 40 weights, have a TBN of 40. The higher TBN Mobilgard 42 Series is intended to provide additional alkalinity reserve for engines with low oil consumption or low temperature cylinder liners, or which operate on higher sulfur fuel.

For free literature detailing Mobil lubricant products

Circle 51 on Reader Service Card

PRE-LUBE 6

Distributed by horizon Distribution and manufactured by Grignard Company, Inc., Pre-Lube 6TM is a polymer-based rust preventative and lubricant.

Pre-Lube 6 contains a patented rust-inhibiting polymer that bonds with metal, plastic, or vinyl surfaces when applied, creating a seal and protecting the surface from corrosion or rust.

Some of Pre-Lube 6's industrial users are U.S. Steel, Bethlehem Steel, Conoco and Texaco. Military users include the U.S. Navy and Coast Guard. MIT, Woods Hole Oceanographic Institute, Bedford Institute of Oceanography, Columbia University, and University of Miami are among the research and educational institutions that use Pre-Lube 6 to protect their marine equipment.

In the marine environment, Pre-Lube 6 protects navigation lights, all engine parts, bow rails, fishing tackle, electronics, and even rub rails and plastic fenders.

For all moving parts, such as winches, fishing reels, steering cable, pulleys and bearings, Pre-Lube 6 provides protection and excellent lubrication.

Pre-Lube 6 was originally invented to protect U.S. Navy aircraft carrier deck pennants and purchase cables from rust.

For further details about Pre-Lube 6,

Circle 55 on Reader Service Card

SHELL

Caprinus^R U Oil 40 is Shell's premium quality single grade diesel engine oil recommended for use in modern medium-speed diesel engines in marine and stationary

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power applications.

Zinc-free Caprinus U Oil 40 is an LMOA Generation 5 performance oil and is approved by General Electric as a Generation 4 Long Life Oil and classified in the "Extensive Use" category by EMD of General Motors. It is also recommended for GE ALCO Power and Fairbanks Morse engines. In marine applications, Caprinus U Oil 40 can be used in

both main propulsion engines and many auxiliaries. Caprinus U Oil 40 prevent formation of hard carbon in ring belt areas and minimizes port blocking in two-stroke cycle diesel engines.

Premium multigrade oils maintain a tough film between moving parts, even at higher temperatures. Caprinus Multigrades are formulated with Shellvis^R, a patented vis-

cosity index improver. Caprinus Multigrade Oils are available at two additive treatment levels: Shell Caprinus U 20W-40 at 13 TBN and Shell Caprinus UE 20W-40 at 17 TBN. Both SAE 20W-40 oils provide the unique performance benefits over an SAE 40 of reduced engine fuel consumption, reduced oil consumption and, in severe applications, longer oil drain periods

through control of used oil viscosity increase.

ShelltransTM Oils are blended in high-quality Shell MVT base stocks and are based on all the widely used additive treatments. Shelltrans Oils, with less than 10 parts per million of zinc and a viscosity index of 80, are approved for commercial use by EMD and GE and are recommended for use in many other medium-speed engines.

For free literature detailing the complete line of commercial marine lubricants available from Shell,

Circle 52 on Reader Service Card

TEXACO

Texaco offers a complete line of quality marine lubricants which are available worldwide to meet the needs of all types of marine equipment.

For crosshead engines, Texaco offers Taro Special, a premium quality cylinder lubricant for large, slow-speed diesel burning residual fuels. It is blended from highly refined paraffinic base oils and oil soluble additives to produce a high alkaline reserve (70 TBN) product with good lubricant film strength.

Taro Special EX 85 is a premium quality cylinder lubricant specifically developed to meet the requirements of Sulzer RLB engines. It is approved by Sulzer for those applications where an 85 TBN product with a viscosity of 24 est at 100 degrees C is specified.

Doro AR 30 (SAE 30) is a premium crankcase lubricant for large, slow-speed engines. It is blended from highly refined solvent neutral oils and carefully selected additives to produce a moderate alkaline reserve (6 TBN) oil. Doro AR 30 meets the Sulzer requirement for engines equipped with PTO units.

Texaco offers a complete line of trunk piston engine oils for medium- and high-speed diesels. The specific lubricant required would be based on sulfur content of the fuel being used in the engine. Taro XD oils, with a TBN of 15 minimum, are used in engines burning fuel with a sulfur content up to 1.8 percent. Taro XD and Taro DP are available in SAE 30 and SAE 40 viscosity grades. Taro XL 40 (SAE 40) is for use in medium-speed engines where the operating conditions or fuel sulfur content requires a 40 TBN product.

Texaco supports its marine lubricants with prompt, efficient technical service and the Texlube used oil analysis program for monitoring the condition of oils in use.

For free literature detailing Texaco marine lubricants,

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Maritime Reporter/Engineering News

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July 1992 - Report No. 7121 - \$575.00 per copy

This totally new report assesses the outlook for Navy ship repair, modernization and inactivations — given future naval force requirements. It provides a forecast of business opportunities available to shipyards and marine equipment suppliers. A market share analysis is included. The report covers ships in the active naval fleet, reserve fleet, MSC fleet and the ready reserve fleet managed by MarAd.

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OUTLOOK FOR CONSTRUCTION OF U.S. FLAG SHIPS

UNDER NEW MARITIME POLICY GUIDELINES

August 1992 - Report No. 7122 - \$575.00 per copy

The Bush Administration recently announced sweeping changes in maritime policy have been proposed to improve the competitiveness of U.S. flag ship owners. By freeing owners to build abroad, the new policy opens tremendous new opportunities to shipyards and equipment manufacturers — and will produce a massive investment program for new ships and equipment. IMA's new report provides details for the new policy, assesses industry reaction and identifies specific owner construction plans.

* * * * *

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New Exploration Agreement Between Vietnam, S. Korea

Vietnam's state oil company Petrovietnam has recently signed a contract with a South Korean consortium consisting of eight companies to explore for oil off the south coast.

The agreement covers one of sev-

eral offshore blocks formerly controlled by a Vietnamese-Soviet joint venture. Several western, South Korean and Japanese firms have made bids on the blocks.

The agreement is the first major investment that South Korea has ever made in communist Vietnam. The South Korean government in Seoul has until recently followed a U.S. trade embargo against Vietnam.

COMSAT Introduces C-LinkSM Dial-In Service

Washington, D.C.-based COMSAT Mobile Communications recently announced the introduction of its new C-LinkSM Dial-In Service which provides an easy way for people aboard ship to be linked with contacts on shore.

By using local telephone access to Sprint's X.25 packet data network the service requires no special shoreside equipment. "Until now, C-Link users were limited to sending messages to people who had access to a telex machine," said **John R. O'Brien**, COMSAT Maritime Services' vice president of marketing and program management. "Messages sent to them also had to originate from telex, and that made it difficult for shore-based users, particularly family, to keep in touch with those at sea. With the C-Link Dial-In Service, the only equipment needed is a computer terminal with terminal emulation software, a modem and an analog telephone line."

COMSAT began providing its C-Link service, which is a two-way, store and forward messaging service that uses compact and inexpensive Inmarsat-C satellite terminals for text and data messaging, in November 1991.

For free literature about COMSAT and its new C-Link Dial-In Service,

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Russian Ships Can Now Call At Detroit On 24-Hour Notice

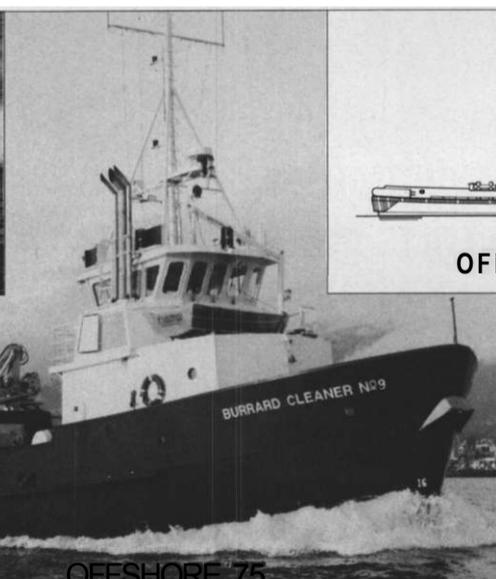
A new agreement between the U.S. Maritime Administration and the Russian Ministry of Transportation allows Russian ships calling on the Port of Detroit to give only 24-hour advance notice, instead of the previous 7-day notice.

The new maritime agreement was signed in Moscow by U.S. Maritime Administrator **Warren G. Leback** and **Oleg A. Savin**, Deputy Director of the Department of Marine Transport for the Russian Federation.

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Adaptable Ports Needed For RO/ROs

John McNab, chief executive of London's newly privatized Port of Tilbury, said that world ports must be able to offer a full range of wharfside facilities to handle the wide cargo mix of roll-on/roll-off vessels, which includes: vehicles, containers, pallets, forest products and fresh produce.

Calling reports of their impending decline false, Mr. **McNab** said that RO/ROs will continue to remain "as a strong and viable shipping option" in the deepsea trades because of their versatility.

The new generation of RO/RO vessels that also combine lift-on/lift-off (LO/LO) capabilities are some of the most versatile ships built in this decade, according to Mr. **McNab**. "The key advantage of the roll-on vessel is that it allows room for the operator to adapt to the market," he continued, "... and port operators must gear themselves towards providing efficient and accessible combination facilities."

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NOR-FISHING '92

*International Fishing Exhibition Scheduled
For August 11-15 In Trondheim, Norway*

The site of several important fishing organizations and research institutions, the city of Trondheim, strategically located in the heart of Norway's fisheries, will be the venue for one of the world's largest international fishing shows this year. Called Nor-Fishing 92, the event has been set for August 11 and 15 at the Nidarø exhibition center. Seminars will be presented at the Royal Garden Hotel in Trondheim.

Last held in 1990, Nor-Fishing drew over 750 companies from 29 nations. An impressive 41 countries were represented among the 16,350 professionals who attended the show.

This year's show will focus on the impact of tight quotas and the growing environmental awareness on both Norwegian and international fishing. One seminar during the exhibition, for example, will focus on more selective fishing and making better usage of by-products.

Underlying these topics is the view that improved utilization of seafood resources could also yield a long-term economic dividend for fishermen and the fishing industry. The two main seminar topics, which will be presented on Wednesday, August 12, and Thursday, August 13, will be: "Utilization of Resources—Selective Fishing," and "Fishery By-Products, A Resource or a Problem?"

Selective catches of large fish and the most valuable species will normally be the most profitable approach, with side catches of little value frequently thrown away.

The question is whether sorting



The Martinac-built trawler Chelsea K.

screen techniques developed in Norway for selective prawn fishing can be used in other fisheries with side catch/throw-out problems. It is also debatable whether current regulations are adapted to such technological innovations.

Presentations will cover national and global challenges associated with selective fishing technology, methods for use with specific species, and size selection from trawling and purse seining.

One paper also asks whether fish survive when they escape from a catch, thereby making selective fishing worthwhile.

Characterized as one of the world's leading events of its kind, Nor-Fishing covers a total exhibition area of 15,000 square meters—13,000 square meters of which is indoors. Using no less than six exhibition halls, more than 500 companies will be presenting the very latest products and services offered by the in-

ternational fishing industry.

Nor-Fishing '92 embraces every aspect of the fishing industry at sea and on land—from shipyards and ship's equipment to fishing gear, engines and deck machinery. The maritime electronics group is the biggest ever at the show, filling an entire exhibition hall.

A large Danish contingent will include 21 companies, while a number of Swedish companies have joined forces in a common display.

A novelty at this year's show are the tour programs for participants wishing to see more of Norway's fishing industry or its Arctic scenery. These weekend excursions include a flight to Svalbard and a cruise along the coast, a visit to one of Europe's largest fish farms, and a trip by the Coastal Express to Kristiansund.

Nor-Fishing provides an important meeting place for the international fishing industry. A number of foreign delegations have announced their attendance at the show. These groups are from the Netherlands, Japan, and Iran. The fisheries minister of Mexico will head a group of industry representatives. In addition, a group of 60 fisheries officials and representatives of fishing organizations in the Nordic countries will be meeting during the show.

For further information on Nor-Fishing '92, contact: the Norwegian Trade Fair Foundation, P.O. Box 130 Skøyen, N-0212 Oslo, Norway; telephone: +47 2 43 91 00; or fax: +47 2 43 19 14.

Nor-Fishing '92 Exhibitor List

Alden	Caterpillar	Kockum Sonics	Norsk Scania	Simrad
Altpack	Centromar	Koden Electronics	Norske Shell	Skanti Radio
Anritsu	Cetrek	Kuhlautomat Berlin	Norwegian Telecom Int'l.	Skipper Electronics
Anschutz	Cummins Engine	Mapa UK	Onan	Sperry Marine
Aqua Signal	CWF Hamilton	Maritech Systems	Parker Hannifin	Stal Refrigeration
Arctic Boat	Danfoss Norge	Marmet	Perkins Engines	Storck Wartsila Diesel
Arctic Light	Datasafe	Metas	Racal Marine	Stromberg Enterprises
Arentz & Amundsen	Dixie Service	Mikado Propeller	Rapp Hydema	Taiyo Musen
Atlas Elektronik	Esso Norge	MMC	Raytheon Marine	Tokimec
Autronica	Furuno Electric	Mobil Oil	Renk Tacke	Toshiba
Beehive Machinery	Hagglunds Denison	Morse Controls	Robertson Trittech	Trimble Navigation
Bender	Ideal Stencil Machine	Multivac	S.P. Radio	Universal Diesel
Bennex	Japan Radio Co.	Mustad & Son	Saab-Scania	Valmet
Bomar	Jotun Protective Coatings	Newage Norge	Sabroe Kulde	Wesmar
Batservice P. Garstad	Karmoy Winch	Newmar	Scan Rope	Willi Becker
Carrier Transcold	Kelvin Hughes	Norgear	Scanmar	Wartsila Diesel
Cassens & Plath	Kobelt Mfg.	Norselight	Shipmate Int'l.	Yanmar Diesel
		Norsk Atlas		

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Soaring Shipbuilding Demand To Challenge Shipyard Capacity

Drewry Expects 160 Million CGRT To Be Ordered In Next 10 Years

Though current freight rates give many shipowners and financiers cause for concern and orders for new ships have slowed down, the medium to long term outlook for both the shipping and shipbuilding industries is encouraging. Not only is world trade expected to expand, albeit modestly, but the current age of the world fleet combined with the effects of new environmental and safety legislation should exert a positive influence on world newbuilding demand during the remainder of the 1990s. This will not only present a challenge to the world's shipyards to meet demand, but also to owners who will need the means of financing newbuildings.

In the period up to 2001, total newbuilding demand is estimated to be almost 160 million compensated gross registered tonnage (cgrt), with 75 percent of this total expected to be delivered in the period 1996-2001. Current shipbuilding output is running at about 12 million cgrt per year and estimated current annual capacity is 15 mil-

lion cgrt per year. On the surface, with demand in the late 1990s expected to be in excess of 23 million cgrt per annum, there appears to be a shortfall. But, given advances in shipbuilding technology and productivity, the widespread return to series production and also the doubts surrounding the validity of using cgrt as a realistic measure of shipbuilding capacity (the current coefficient were set in 1983), the latest Drewry report, "World Shipbuilding—The Next Ten years: Can the Challenge Be Met?" concludes that the industry will be able to cope with the anticipated increase in demand without constructing new yards or reopening dormant facilities.

The major driving force for increased newbuilding demand will be the aging world fleet together with the tightening of environmental and safety legislation which will shorten the "economic" life of a significant volume of tonnage. Shipping is now well and truly back in the political arena. Besides exam-

ining the age structure of the world fleet, assessing replacement demand and demand generated by the growth of world seaborne trade, the report also considers regional construction patterns, advances in shipyard productivity, the role of government subsidies and the development of newbuilding prices. Drewry expects prices to harden considerably throughout the forecast period and does not foresee the emergence of any new significant shipbuilder with the ability to destabilize the newbuilding market as occurred in the early 1980s when South Korea entered the world scene. Drewry assumes that the newbuilding market will be demand-driven during the rest of the 1990s rather than supply-driven, as was the case 10 years ago.

The report also addresses the crucial question of newbuilding finance. Given the volume of fleet replacement and rising real prices for new ships, where will shipowners find the huge sums necessary? At current prices the financial implications of the newbuilding demand estimated in the report indicate that by 2001 shipowners will have to raise around \$355 billion. Shipping finance is expected to become significantly tighter as the decade progresses and, with commercial banks becoming less generous, owners will have to become more inventive at raising funds for newbuildings and will almost certainly have to provide more equity.

This will require freight rates to be increased to take account of higher newbuilding prices and also higher costs brought about by changes in the operating environment. The yards themselves will have to become even more involved in financing if they wish to exploit the potential market.

The OECD is under strong pressure from the U.S. to abolish all newbuilding subsidies, including government-backed export credit. If governments take the opportunity to disengage from ship subsidization altogether, this popular form of finance would disappear. The EC is also committed to the reduction and ultimately the abolition of subsidies.

Leasing is a valuable potential source of newbuilding finance and is clearly in favor among some prominent owners, but there needs to be a greater cooperation between lessors and lessees for this form of financing to increase substantially.

Because of the high risk factor, the few banks which remain active in this capital intensive market in the 1990s will stick more closely to conservative lending policies. They will strictly apply the same criteria to marine financing as to their other long term activities. Undercapitalized one-ship companies and financially weak owners will find it hard to persuade banks to grant loans. Most owners will have to provide more equity which will be dependent on the health of the market.

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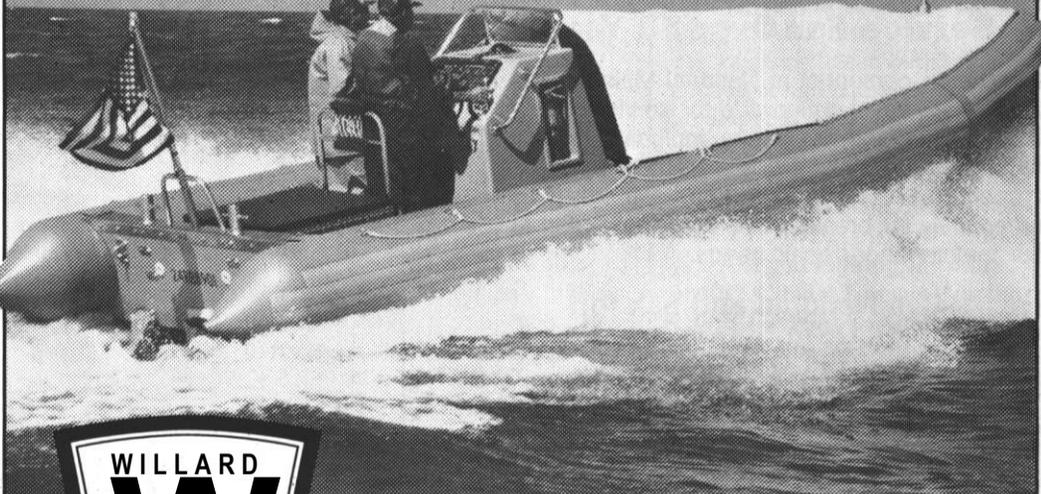
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CREDIT IN THE BUNKER BUSINESS

Pitfalls, Problems, Techniques And Solutions

Conference told shipowners are being given "extraordinarily generous" credit terms for bunkers.

The average bunker stem in today's shipping industry is around 700 tons per ship with a current value—at \$85 per ton—of some \$60,000. On an average fleet size of fourteen ships, a shipowner would make around 100 stems a year and therefore purchase some \$6 million worth of bunkers per annum or \$500,000 a month.

Speaking on "Credit in the Bunker Business; Pitfalls, Problems, Techniques and Solutions" at the ARA International Bunker Conference in Rotterdam, Mr. **Stuart Kenner**, managing director of the Oxford-based marine financial analysis and credit assessment company, MRC Business Information Group Ltd., said that the vast majority of this purchasing was done on an unsecured credit basis.

The world consumption of marine bunkers was around 142 million tons of product a year and although suppliers gross margins were typically only \$2-3 a ton, "high five or even mid six figure credit on 30 days or longer" were often given.

This was so despite the fact that both exposures and risks had increased for the suppliers while costs had risen for shipowners thereby making them less profitable and therefore higher risk entities to sell to. "Given this," said Mr. **Kenner** "the ease with which such large credit exposures are granted on such

generous terms to the shipping industry is extraordinary." The enormous cost to the supplier of a bad debt spoke for itself.

Credit, said Mr. **Kenner**, was not so much about credit control as about risk assessment and risk management. This required relevant, reliable information, intelligent interpretation, experience and having in place a properly understood system with clear criteria for making credit decisions.

Armed with these attributes, suppliers could expand their business by selling to buyers which less informed or less organized competitors might shy away from, while still being able to hold back when the risk was higher than they wished to accept.

Effective credit, he said, starts before, not after, the event and as such was a positive tool not a negative one.

Suppliers, he said, needed to recognize that credit management was now a vital function which needed to be identified and allocated a clearly designated line of authority and a defined set of procedures for giving credit, controlling it, and dealing with the consequences if things went wrong.

All bunker suppliers, said Mr. **Kenner**, were in a risky business and therefore needed to know how to assess that risk. Every individual

supplier had a different scale of what risk he could bear and therefore each supplier needed to decide for himself whether his policy was to be ultra cautious, just plain conservative, willing to take a few chances or "to hell with it, give it a go".

No one consciously took on a bad debt. "So, first decide where on this scale you fit in, then find out whether the risks you are *actually* facing are in the category of one you are *prepared* to face."

Mr. **Kenner** said: "Obviously a six-month-old one-ship owning company in a poor nation is a higher risk than an old established 20-ship owner in Western Europe. However, this is very much NOT the only criterion—the big old owner is precisely the one you are least likely to spot if it starts to get into trouble." It was exactly this kind of company which was likely to have built up a big exposure. "All customers need to be assessed on a regular basis, not just new ones," said Mr. **Kenner**.

Other factors to be considered included: if the buyer has a financial problem will its owners support it? are meaningful accounts available? what is the domicile of the buyer? does the company have cash or assets and if assets are they fully mortgaged? what is the buyer's track record, does it generally pay its bills on time? what is its commercial morality? how good is it at commu-

nicating with the supplier if a payment problem arises? is the company well managed and how prepared and able is it to cope with the unexpected?

In the event of non-payment and as a last resort, bunker suppliers should also be aware of the power they hold in "that unique, clinical and destructive weapon, the ship arrest" and the fear it generates. Companies without access to maritime liens, such as container lessors, were green with envy at this tool.

"Shipowners (when the buyer was a charterer), charterers (in the reverse case) and cargo owners were truly terrified about whether a nasty bunker supplier would arrest a ship for someone else's debt," said Mr. **Kenner**.

Given proper communications on both sides and the employment of persuasive intelligent argument and sound credit management systems, suppliers should be able to minimize their risks.

But as a last resort, the ship arrest did remain a powerful tool which bunker suppliers should not hesitate to use—if they have to.

For additional information, contact: Peter Brierley, Stratics Consultants Limited, 37B High Street, Chislehurst, Kent BR7 5AE, U.K.

John C. Adams Named ACH's Executive VP Of Gulf Operations



John C. Adams

Aalborg Ciserv Houston, Inc., U.S.A., has recently announced the appointment of **John C. Adams** to the post of executive vice president responsible for U.S. Gulf operations.

Mr. **Adams** brings 27 years of experience in shipbuilding and repair management to ACH. His most recent position prior to joining ACH was as the vice president and general manager of Phillyship, a ship and engine repair network based in Philadelphia.

A member of Aalborg Ciserv International A/S (ACI), ACH engages in boiler manufacture and installation in industrial and marine applications worldwide. Eight company service centers located in major U.S. ports provide maintenance and repair to diesel engines, gas and steam turbines, turbochargers, compressors, boilers, heat exchangers and electrical systems.

Singapore's Marine Industry Posts \$1.9 Billion Growth

Singapore's marine industry saw a record 38 percent growth in 1991, with local shipbuilding, ship repair, offshore rig construction and related

marine businesses earning \$1.9 billion.

The demand for harsh environment rigs and increased offshore repair and maintenance contracts from China gave the industry's rig-building segment the largest gain of 125 percent.

The shiprepair industry grew by 50 percent as many ships avoided the Persian Gulf during the war and came to Singapore. In 1991 Singapore secured 64 supertanker-repair contracts equating to 60 percent of the world repair market.

Singapore's container throughput jumped by 22 percent in 1991 to 6.35 million TEUs, making it the largest container port in the world. To maintain its international position, the Singapore government plans to spend \$200 million on the construction of a fourth container terminal. Work is to begin in 1993 on reclaiming 300 acres of land from the sea over a three year period.

As another related example of

the country's economic optimism, Keppel, one of Singapore's leading shiprepair corporations, is forming a joint venture with Arab Heavy Industries (AHI), of Ajman, United Arab Emirates, to undertake floating repairs in the Middle East. Keppel is also negotiating for acquisition of Sri Lanka's Colombo dockyard.

Bill Signed Legalizing New Orleans Casino

A bill legalizing a New Orleans casino was recently signed by Louisiana Governor **Edwin Edwards**.

Under the new law, the casino will be required to produce \$100 million in revenue for the state or 18.5 percent of gross gambling revenue, whichever is larger. The city will receive rent and other revenue from the project.

The bill's supporters believe that the casino could create 15,000 to 25,000 jobs and boost tourism.

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Halter Marine To Build U.S. Navy T-AGS-62 Under \$42.3 Million Pact

Halter Marine Inc., Gulfport, Miss., part of the Trinity Marine Group, recently received a \$43.2 million contract for the construction of T-AGS-62. The contract, N00024-91-C-2316, was awarded by NAVSEA.

FMC Issues Notice For 3 Proposed Rule Changes

In an effort to effect regulatory change, the Federal Maritime Commission (FMC) has issued three notices of proposed rulemaking to amend certain FMC regulations.

Docket No. 92-26 proposes an amendment to regulations that exempt certain marine terminal barge operators from Shipping Act tariff filing requirements.

Docket 92-27 would reduce annual certification filing requirements of ocean freight forwarders to every two years. The proposal would be a cost saver to forwarders and the commission.

In Docket 92-28, the FMC proposes an amendment to regulations that would "eliminate certain outdated or unnecessary regulatory provisions."

For further information on Docket 92-26 and Docket 92-28, contact:

Bryant L. VanBrakle, director of FMC's Bureau of Tariffs, Certification and Licensing. (202) 523-5796. For additional information on Docket 92-27, contact: **Seymour Glanzer**, FMC's director of the Bureau of Hearing Counsel, telephone: (202) 523-5783; fax: (202) 532-5785.

Singapore Buys \$12 Million VTS From Norcontrol

To augment its existing Vessel Traffic Information System (VTIS) 1 that has been in place since 1990, the Port of Singapore Authority has signed a \$12 million contract with Norcontrol AS, Norway, for the installation of a VTIS 2 and Port Traffic Management System with Norcontrol Surveillance System.

While Vessel Traffic Systems (VTS) have been used in the U.S. with varying degrees of success, Singapore said the system is absolutely necessary because of the nation's limited waters where up to 1,000 vessels must be tracked.

A prepared statement from the authority stated: "With increasing vessel traffic, the VTIS 2 is expected to enhance navigational safety in the port."

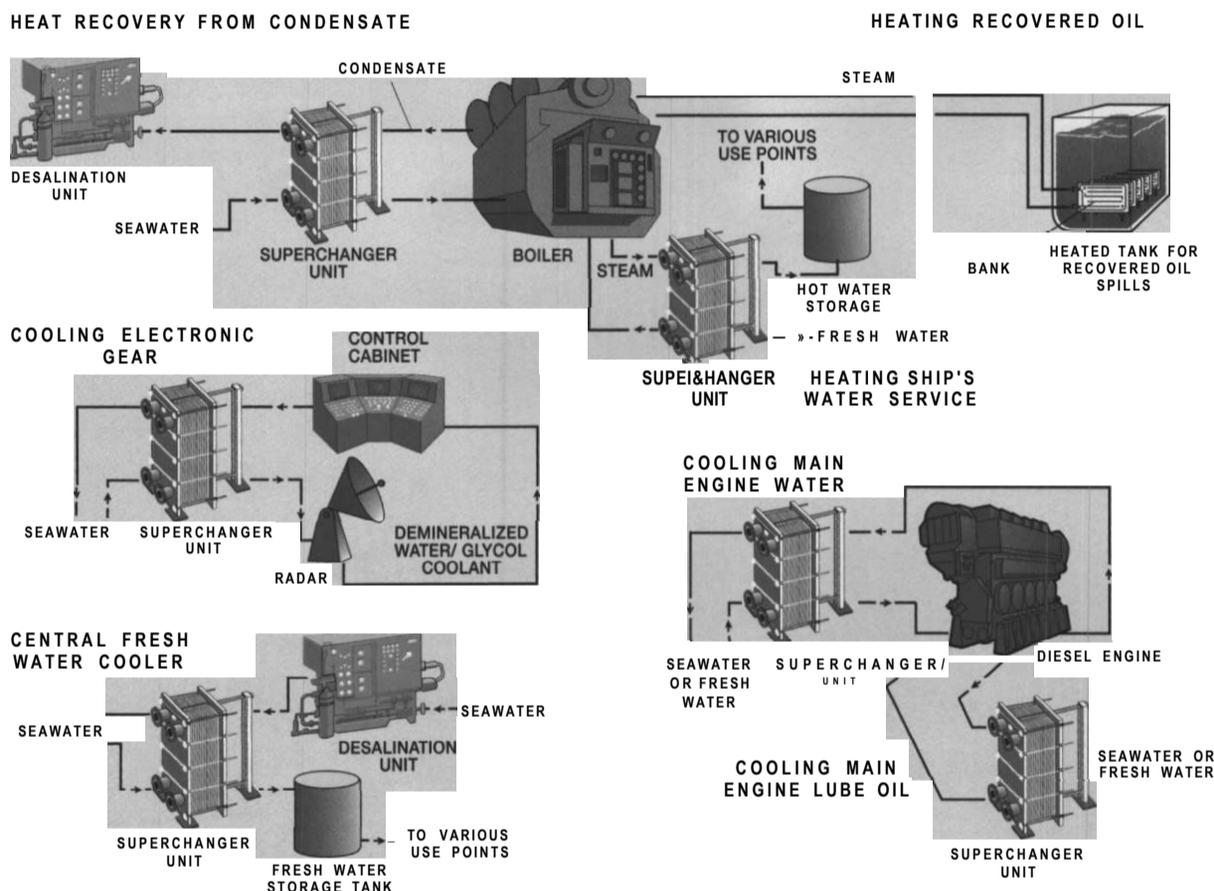
The Port Traffic Management System will store and process data on all vessels calling on the port and will link with the VTIS 2 and related functions such as mobile radio data terminals.

Norcontrol will design, supply and install the company's VOC 5000 work stations, radar and tracking system, radio and data communications and Port Traffic Management System for the Port of Singapore.

For additional information about Norcontrol's VTS equipment line and services,

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How to Operate More Efficiently At Lower Cost With Tranter Plate-type Heat Exchangers



Naval ships, fleet oilers, commercial containerships, tankers and dredges are successfully finding new ways to operate more efficiently at lower cost, by utilizing Tranter's unsurpassed plate-type heat exchanger technology. Schematics presented here illustrate typical ways they are doing it.

Superchanger® plate and frame heat exchangers are used in a wide variety of shipboard applications—particularly for cooling main engine jacket water and cooling main engine lube oil with fresh water or seawater; cooling the ship's central fresh water; cooling electronic equipment; or recovering heat from condensate. They are far more efficient than tubular systems, and provide heat transfer coefficients from two to five times greater than those achieved by shell and tube units. They also require 10% to 50% less deck space and weigh up to one-sixth less.

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of hot and cold liquids is virtually impossible. Low fouling rates reduce cleaning requirements for Superchanger units, that are designed for easy maintenance. They can be cleaned-in-place by backflushing, or quickly disassembled by hand, cleaned and put back in operation.

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Platecoil bayonet heaters provide a large amount of efficient primary heating surface in a single unit for maintaining desired temperatures in storage tanks. These heaters help promote convection currents for better heat transfer rates and tank temperature uniformity. Platecoil suction heaters provide immediate heating for pumping oil out of tanks.

Tranter plate-type heat exchangers can be supplied in full compliance with codes and specifications as required by the ABS; the U.S. Coast Guard; shock testing per MIL-S-

901C; vibration testing per MIL-STD-167-1; and ASME U stamp per Sec. VIII Div. 1.

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Sundial Launches Wood Chip Barge For Columbia/Snake River

Troutdale, Ore.-based Sundial Marine and Barge Works, Inc., an affiliate of Tidewater Barge Lines, Inc., Vancouver, Wash., recently launched one of the largest wood chip barges on the Columbia/Snake River system.

The new 288-foot by 42-foot barge B-10, owned by Bernert Barge Lines, will have a capacity of 1600 BDU's (bone dried units) and will operate from Lewiston, Ida. to Longview, Wash.

The barge will join a fleet of 14 wood chip barges and three tugs owned and operated by Bernert on the river system.

Sundial is engaged in marine repair and construction and has built many of the existing grain, petroleum, wood chip and container barges hauling cargo on the river.

For additional information about the services and facilities available from Sundial Marine and Barge Works,

Circle 67 on Reader Service Card



Western Renaissance, one of the world's largest well stimulation vessels, under construction by Singmarine for The Western Company.

Singmarine Launches One Of World's Largest Well Stimulation Vessels For The Western Company

The well stimulation vessel Western Renaissance was recently launched by Singmarine Dockyard and Engineering Pte, Ltd., a subsidiary of Singmarine Industries, Ltd., for The Western Company of North America, Houston, Texas.

Singmarine Dockyard & Engineering, a leading builder and repairer of small and medium sized vessels in Southeast Asia, received the \$52 million construction contract to build the vessel at its Tanjong Rhu Shipyard in 1990.

The Western Renaissance is currently undergoing its final outfitting at Singmarine's main yard in preparation for delivery to the Western Company later this year. With a length over all of 93.9 meters (308 feet) and a 20.5-meter (67.2-foot) breadth, Singmarine reports that the vessel is one of the largest ships of its type in the world.

The Western Renaissance will operate in the North Sea oil and gas fields of the United Kingdom, Norway, Denmark and The Netherlands and is equipped with an extensive storage and pumping capacity.

The ship has also been provided with several unique safety, environmental and reliability features that will allow it to operate in the harsh environment of the North Sea and still carry out its specialized functions. These include a fully redundant dynamic positioning system which will allow the vessel to complete a well stimulation job in the face of gale force winds by utilizing three bowthrusters and the main engines to keep the vessel in position. To facilitate operations and to allow the ship to be resupplied at sea, a large helideck certified to

handle a steel-Super Puma type helicopter has been fitted forward of the bridge. Moreover, the vessel's separate pollution control system for containing corrosive and oily spillage allows rigid environmental standards to be maintained.

According to **Sheldon R. Erikson**, chairman and chief executive officer of The Western Company: "The unique features of Western Renaissance, including pumping rates in excess of 90 barrels per minute, will result in significant cost and time savings and improved well production for the customer."

The Western Renaissance will be operated by Western Petroleum Services International Company, which provides pressure pumping services worldwide on behalf of its parent company, The Western Company of North America.

Singmarine Industries, Ltd., is a member of the Keppel Group, a Singapore-based conglomerate engaged in shiprepair and shipbuilding, rigbuilding, property, shipping, transportation and telecommunications, banking and financial services as well as engineering.

The Keppel Group has a longstanding relationship with The Western Company. Singmarine's sister-company, Far East Livingston Shipbuilding (FELS), Ltd., built two jack-up rigs in 1981 and a semi-submersible in 1983 for The Western Company.

For additional information about the services and facilities available from Singmarine,

Circle 62 on Reader Service Card

Lash Marine Announces 2 Key Appointments

Lash Marine Services, New Orleans, recently announced the appointments of **Sue L. Robertson** to director of marketing and **Greg Gordon** as inland transportation coordinator.

Ms. **Robertson** had been an account executive with LEP/Profit International in Memphis, while Mr. **Gordon** worked for Maersk Inc. in Memphis as an intermodal manager. They will both be located at the Litco Terminal in Memphis.

Fire Safety Actuators From New Joint Venture/Stockham-Ficotech

L.W. Kinderman, president and CEO of **Stockham Valves & Fittings, Inc.**, Birmingham, Ala., and **Charles Gray**, chairman, **FICOTECH, Inc.**, Kingsport, Tenn., have announced the formation of a joint venture company, **Stockham-Ficotech**. The new company will manufacture and sell fire safety actuators, a new patented concept in fire safety and explosion control.

Stockham Valves & Fittings is a manufacturer of flow control products for the industrial and commercial markets. **FICOTECH** is a manufacturer of fire safety equipment. The line of products manufactured and sold by the joint venture will be fire safety actuators which are used by all industrial and commercial markets where there is risk of fire and catastrophic explosions. The actuators are designed to mount on **Stockham valves** as well as other manufacturers' products.

Leonard Nicely, formerly president of **FICOTECH, Inc.**, has been appointed president of the new joint venture.

Manufacturing and sales of the product lines will be located in **Birmingham, Ala.**, with engineering, research and development in **Kingsport, Tenn.**

For free literature detailing the new company,

Circle 76 on Reader Service Card

Radisson May Place \$500 Million Order For 4 Cruise Ships

U.S.-based **Radisson Hotels International** is reportedly negotiating the financing of four cruise ships worth in excess of \$500 million, following the delivery of its first ship, the revolutionary **SSC Radisson Diamond**. The aggressive expansion by **Radisson** would be a direct challenge to market leader **Carnival Cruise Line** of Miami.

Two of the ships would be similar in design to the twin-hulled **Radisson Diamond** and two others would be mono-hulled. The \$140-million **Radisson Diamond**, owned by **Diamond Cruise Ltd.**, and managed by

Radisson Hotels International, was recently delivered by Finnish shipbuilder **Finnyards**. She is 415 feet long, has a beam of 105 feet and can accommodate 354 passengers.

Although the order for a sister ship to the **Radisson Diamond**, the **Radisson Sapphire**, is expected to go to **Finnyards**, bids have been asked from other yards.

Radisson is part of the **Carlson Companies** of Minneapolis, one of the world's largest hotel and travel groups.

Colonial Marine, Gulf Ship To Form Joint Venture

Tentative agreement has been reached on the formation of a joint venture between **Savannah, Ga.**-based **Colonial Marine Industries** and **Gulfship Marine, Inc.**, of **Houston, Texas**. The new joint venture, **Colonial/Gulfship Marine**, is likely to become a **Cayman Islands** corporation and would operate approximately 20 owned or chartered ships.

Colonial/Gulfship's marine operations and chartering functions would be managed by **Colonial Marine**, whose president, **John Demere**, would be the joint venture's chairman.

Some of the first acquisitions planned by **Colonial/Gulfship** are for at least six ships varying between 5,000 to 20,000 dwt for services linking the U.S. and the following areas: the Caribbean; South America; West Africa; Red Sea; Persian Gulf; India; and eventually the Gulf of Mexico.

Siemens Launches New Industrial Systems Division

Siemens Electric Limited recently announced the launching of its new **Industrial Systems Division**, **Pointe Claire, Quebec, Canada**, which will be responsible for integrated electrical systems for the marine, offshore, diesel power, pulp and paper, mining, metals, petrochemical and chemical industries.

The division includes major elements of the former **Electrical System Division** and is strongly oriented towards a systems approach using equipment manufactured by **Siemens**, together with **Siemens** automation, to offer engineered system solutions for projects of all sizes.

Canadian engineers have been involved in the design and delivery of electrical systems for such projects as: **Canadian lakers, icebreakers, ferries and trawlers; Halifax and Montreal harbor cranes; and diesel-electric generating plants**. They will now be able to use the expertise acquired on these projects to offer integrated systems with a minimum of outside interfaces, supervise the installation, commission the system, and provide after-sales customer service.

For free literature detailing the new **Industrial Systems Division** of **Siemens Electric Limited**,

Circle 15 on Reader Service Card

Mar Ad's Management Control Over Title XI Vessels

Detailed Federal Policies And Procedures May Be Needed To Better Monitor The Program's Performance

The Federal Ship Financing Program was established by Title XI of the Merchant Marine Act of 1936 (Ch. 858, 49 Stat. 1985). To promote the U.S. merchant fleet and encourage domestic shipbuilding, the act, as amended, provides federal guarantees of debt used to finance the purchase or construction of privately owned American-flagged vessels built in U.S. shipyards. If a borrower defaults on a loan, MarAd pays the lender the outstanding balance and usually forecloses, takes title to the vessel or vessels put up as collateral, and attempts to recoup the government's losses by selling the vessel or vessels. MarAd usually stores the vessels in its custody at its National Defense Reserve Fleet facilities. Currently, the \$2.57 billion in loans that the program has guaranteed covers approximately 3,000 vessels and 163 shipowners. There are over 50 vessels in Mar Ad's custody as a result of defaults totaling approximately \$143 million. According to MarAd officials, these vessels have an estimated resale value of \$42 million.

Payments to lenders and maintenance and storage costs for vessels in Mar Ad's custody are paid by the Federal Ship Financing Fund—a revolving fund financed by proceeds from the sale of vessels and from fees paid by borrowers whose loans are guaranteed. Although the fund is self-supporting at this time, in fiscal years 1987 and 1989 MarAd received supplemental appropriations of \$1,375 billion and \$515 million, respectively, to cover losses by the fund. As of September 30, 1991, the fund had \$700 million in cash and investments.

In addition to administering the title XI program, MarAd is responsible for maintaining the government-owned National Defense Reserve Fleet, which is a fleet of about 230 inactive merchant ships that can be activated to help meet shipping requirements during a national emergency. There are two components to this fleet: (1) a Ready Reserve Force (RRF) consisting of ships routinely maintained so that they could be activated in 5, 10, or 20 days and (2) a less ready component (non-RRF) consisting of vessels receiving less maintenance, so activating them would require a longer time—between 30 and 120 days. In fiscal year 1991, MarAd budgeted about \$232

million for this program, approximately one-half of the agency's total budget.

MarAd and all other executive agencies are required by the Federal Managers' Financial Integrity Act (P.L. 97-255) to develop and implement management controls (also known as internal controls) in compliance with the Comptroller General's guidelines in the General Accounting Office's *Standards for Internal Controls in the Federal Government*, commonly referred to as the "Green Book." In general, management controls are the combination of policies and procedures program managers use to provide reasonable assurance that program objectives are efficiently achieved with full accountability for the resources made available. The ultimate responsibility for ensuring that management controls are developed and implemented rests with an agency's senior management.

MarAd does not have detailed formal policies and procedures to provide guidance for decisions concerning the custody, maintenance, and sale of vessels acquired when borrowers default on loans. Without such guidance, MarAd cannot be sure that these decisions are achieving the program's objectives in managing and selling vessels. However, MarAd officials believe that their system of review, requiring that decisions be approved by a number of officials, adequately ensures the program's success.

The title XI program's primary objective in taking custody, maintaining, and then selling vessels is to recoup, to the extent possible, the government's losses on defaults. When a borrower defaults, MarAd usually takes custody of and eventually title to the vessel. (MarAd takes custody of the vessel before it has title in order to protect the vessel's value in anticipation of the foreclosure sale. Legal proceedings can prevent the foreclosure sale from taking place for up to five years after the default.) Once MarAd takes custody, it must decide how long it expects to retain the vessel and how much it should spend on preservation and other custodial expenses, such as insurance. After MarAd takes title, it must decide when and for what price to sell the vessel. These decisions involve thousands to millions of dollars. For example,

in fiscal years 1983 through 1991, MarAd sold over 2,000 vessels for a total of more than \$937 million and spent approximately \$65 million on preservation and custodial expenses. The annual cost of storing and maintaining a vessel can range from \$2,500 to \$1 million, depending on the type of vessel.

Besides recovering losses on defaults, the title XI program has a second objective in managing and selling vessels, which stems from MarAd's overall mission to foster the development and encourage the maintenance of the U.S. maritime industry. In particular, in operating the title XI program, MarAd tries to avoid harming weak sectors of the shipping industry by not introducing additional capacity through the sale of vessels. For example, when MarAd obtained a large number of supply boats used to transport equipment to oil rigs, the agency decided to hold for later sale those vessels that were in better condition and to sell the other vessels with the restriction that they would be used for different purposes, such as fishing. Thus, MarAd avoided doing economic harm to owners of supply boats remaining in use in the oil business.

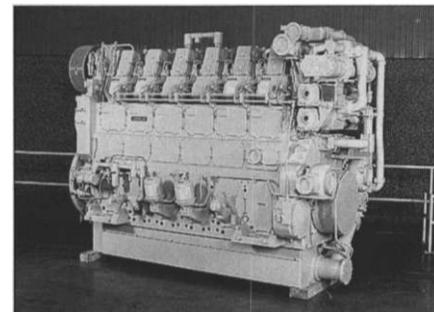
Without detailed formal policies and procedures, appropriate documentation, and adequate performance indicators, title XI program managers cannot be sure that their activities in managing and selling vessels are as efficient and effective as possible. While MarAd officials believe that these activities are being conducted properly, no one can independently confirm this because of lack of these basic management controls.

To help ensure that the title XI program is administered efficiently and effectively, the General Accounting Office recommends that the Secretary of Transportation direct the Administrator of MarAd to take the following actions:

- Develop detailed formal policies and procedures to guide decision-making regarding the custody, maintenance, and sale of title XI vessels.
- Identify and document significant information and program activities concerning decisions affecting the custody, maintenance, and sale of individual vessels.
- Develop indicators to allow MarAd officials and others to better monitor the program's performance.

Caterpillar Marks Production Of 500th 3600 Family Engine

Caterpillar's Engine Division, Mossville, Ill., recently reached a production milestone with the construction of the 500th diesel engine in its 3600 family. Production of the 3600 line began in April 1985 and it is the largest line of diesel engines that Caterpillar builds.



The 500th 3600 family engine built by Caterpillar, a six-cylinder Cat 3606 diesel engine rated at 1,700 - 7,300 hp (1,270 - 5,450 kW).

The 500th engine was a 3606 heavy fuel marine propulsion engine bound for a shipyard in the Netherlands, where it is to be fitted into the vessel M.B. Thames. The engine is rated at 2,146 hp (1,600 kW) at 900 RPM.

The 3606 is the in-line six-cylinder engine in the 3600 diesel family. Caterpillar also builds the V-8 3608, V-12 3612 and the V-16 3616 engines, the latter being the company's largest diesel engine with ratings as high as 7,300 hp (5,450 kW).

For free literature about Caterpillar's 3600 family of diesel engines,

Circle 26 on Reader Service Card

APL, Compagnie Maritime Start Joint Feeder Service

The Compagnie Maritime d'Affrètement (CMA), of Marseilles, France, and Oakland, Calif.-based American President Lines Ltd. (APL) were scheduled to begin a joint feeder service in the Persian Gulf and the Gulf of Oman in mid-June.

APL's 900-TEU President Taft will carry out the service with weekly port calls at Bahrain, Kuwait and Dammam, Saudi Arabia, connecting at CMA's Arabian Gulf "hub" port Fujairah, United Arab Emirates, for points elsewhere in the world.

Coast Guard Releases OPA 90 Monthly Updates

The monthly Oil Pollution Act of 1990 News Update produced by the Coast Guard's Office of Marine Safety, Security and Environmental Protection has been released and free copies are now available. The monthly newsletter provides a brief overview of the actions the CG is taking to carry out OPA 90, with abstracts of the major rulemakings, studies and special projects.

To obtain free copies, call the Coast Guard at (202) 267-6819.

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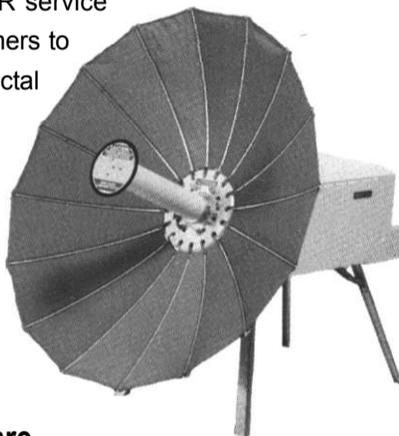
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HEIDRUN

—A Breakthrough For Concrete Technology

In December last year, Norwegian Contractors was awarded an EPCI contract for the concrete hull of Conoco's Heidrun TLP (Tension Leg Platform). The contract includes engineering, procurement and construction of the hull and two module support beams, as well as field installation of the completed platform.

Heidrun is the world's first TLP with a concrete hull, and represents a breakthrough for concrete as a building material in floating offshore platforms. The combination of the TLP concept, originally developed by Conoco, and the use of concrete will give Heidrun a long lifetime with favorable operating and maintenance characteristics. A particular light aggregate concrete will be utilized to reduce weight.

In the hull a considerable amount of mechanical equipment will be installed for topside and hull systems. Utilization of special materials as titanium and GRP-piping is required to satisfy the 50 year life time of the platform.

Large Platform

The Heidrun TLP is a large platform with topside weight of 43,200 tons. The total platform displacement is 288,200 tons. This is four times the size of the Hutton TLP in the British sector of the North Sea and 15 times as much as the Jolliett TLP in the Gulf of Mexico—both of which are operated by Conoco.

The bottom section of the hull will be built in a drydock at Norwegian Contractors' yard in Stavanger, and towed out into the Gandsfjord in mid-October 1993. Slipforming of the four platform legs will start immediately after and be followed by a hectic installation phase for the mechanical outfitting in the top of the four columns. Eight decks will be located—2 in each of the 4 columns. The module support beams will be built in parallel with the hull

and start of construction will take place in the summer of 1993. Mating of the beams and the topside modules to the hull will take place during summer of 1994, immediately followed by hook-up and commissioning.

Extensive Marine Operations

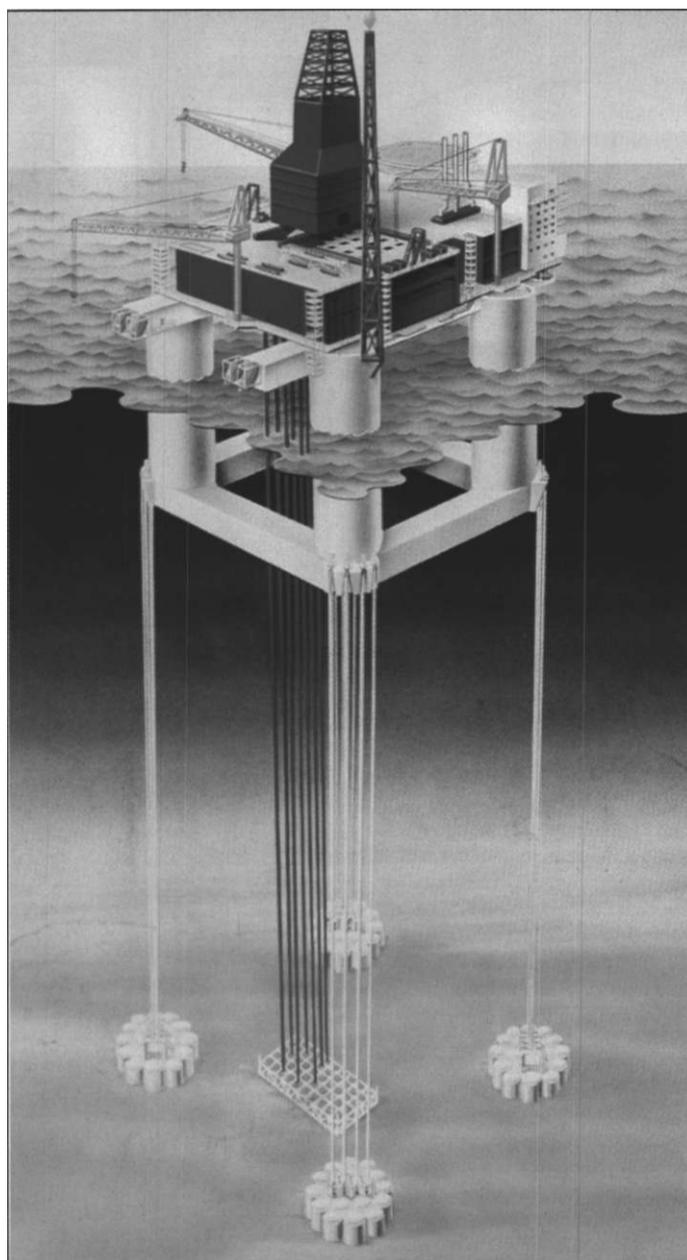
The Heidrun platform represents a unique project for Norwegian Contractors (NC). The amount and complexity of the mechanical engineering involved is actually greater than the engineering of the structure itself. In addition the marine operations will be the most extensive that NC has ever performed. Numerous mating operations are planned, as are complicated and challenging operations in connection with the in-

stallation of the tether foundations and the platform itself.

After the foundations have been installed, the tethers will be towed out and connected horizontally. Then follows the towout of the platform itself, performed by a fleet of ten tugs, for installation of the tethers. This will give the company considerable experience and quite a reference.

Mechanical Installations

The mechanical installations are as complicated as they are extensive. The concrete hull contains storage tanks for crude oil and ballast water, as well as fire-water and sea water pumping systems. In addition, much of the instrumentation is to be installed inside the hull.



The Merits Of Concrete

The Heidrun contract represents a breakthrough for concrete as a building material for the demanding offshore industry. Concrete has successfully competed with steel for more than 20 years as a building material for seabed-installed structures, but this is the first time that concrete has been preferred for use in a floating platform.

A TLP the size of Heidrun would have been extremely difficult to fabricate in steel, due to the necessary thickness of the steel plates and the resulting welding problems and expenses. Concrete, on the other hand, is a relatively inexpensive building material that offers flexible solutions and a virtually maintenance-free structure.

Production Start 1995

Installation of the seabottom foundations also in concrete will take place during the summer of 1994. Field installation of the TLP-platform is scheduled for June 1995, after completion of tether installation.

Tension Leg Platforms

A tension leg platform—TLP—is a floating structure consisting of a hull with topsides and integrated production facilities, permanently anchored to the seabed by means of tensioned steel tethers. The tethers firmly hold the floating structure in a stable, partially submerged position. This eliminates nearly all vertical movement of the platform. NC has developed concepts for concrete TLPs for the North Sea, for arctic regions and for areas such as the Gulf of Mexico.

Conoco Norway Inc.

Conoco is an international oil company with more than 20,000 employees in the U.S., Europe, Africa and Asia. The company was established in 1875, but has since 1981 been part of the Du Pont corporation. Du Pont is one of the world's largest chemical companies, with 140,000 employees. Conoco Norway Inc. has been actively exploring for oil and gas since it was founded in 1971.

Conoco is part-owner of several fields on the Norwegian continental shelf, such as Statfjord, Murchison, Ula, Gyda and Troll.

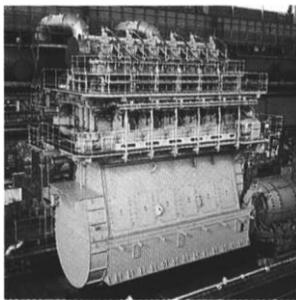
For further information contact: Norwegian Contractors A/S, An Aker Company, Holtet 45, N-1320 Stabekk, Norway.

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AWSC Helps 2nd-Tier Shipyards Comply With U.S. Disabilities Act

The American Waterways Shipyard Conference (AWSC) is assisting second-tier shipyards in their efforts to comply with the American Disabilities Act (ADA), which be-

comes effective July 26, 1992.

The ADA will affect the hiring practices of all employers with 25 or more employees. Revising job descriptions to define the essential functions of positions, and revising application forms to eliminate any questions which may be discriminatory are two steps toward compliance.

The AWSC is making generic job

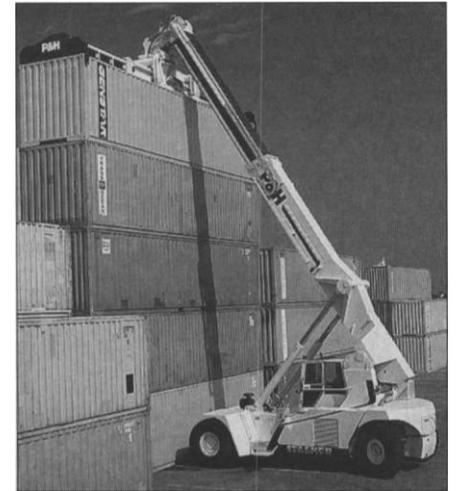
descriptions available for the following positions: welder, sandblaster, machinist, shipwright, electrician, operator and many more.

For additional information on how to obtain the descriptions or applications, call or write: American Waterways Shipyard Conference, 1600 Wilson Boulevard, Suite 1000, Arlington, VA 22209; (703) 841-9300; FAX (703) 841-0389.

PPM Cranes To Produce First U.S.-Built Container Reach Stacker

PPM Cranes, Inc., of Conway, S.C., has introduced the first U.S.-made container reach stacker, a 44-ton capacity unit for five-high stacking of 8-foot 6-inches high cube containers.

Called the P&H Superstacker, the machine will be produced in Conway where the company manufactures a broad line of P&H mobile cranes.



The new P&H Superstacker from PPM Cranes.

Specifically designed to meet the requirements of U.S. container yards, the new Superstacker will be made with U.S.-sourced components, including: a drive train with a Cummins engine, Clark torque converter and Rockwell wet disc brake drive axle; weldment structures, such as the main chassis, telescope boom and frame; and the majority of hydraulic and mechanical systems including valves, hoses and cylinders.

For free literature describing PPM Cranes' new P&H Superstacker,

Circle 10 on Reader Service Card

Argo Marine To Distribute Kvaerner-Made Diesel Parts

It was recently announced by **Thomas J. Calicchio Jr.**, vice president of marine operations for Argo Marine, a division of Argo International Corporation, New York, N.Y., that the company has become the authorized distributor for diesel engine spare parts manufactured by Kvaerner Kincaid of Greenock, Scotland. "We know our customers will be delighted," Mr. Calicchio said.

Kincaid is a manufacturer of parts for slow-speed diesel engines and is licensed by Sulzer and MAN B&W. Kincaid is also the sole authorized manufacturer of spare parts for Doxford engines.

Argo will stock both Sulzer and MAN B&W liners, crowns and skirts in the U.S. at several of its geographically strategic locations.

For additional information regarding Argo Marine and its extensive product line,

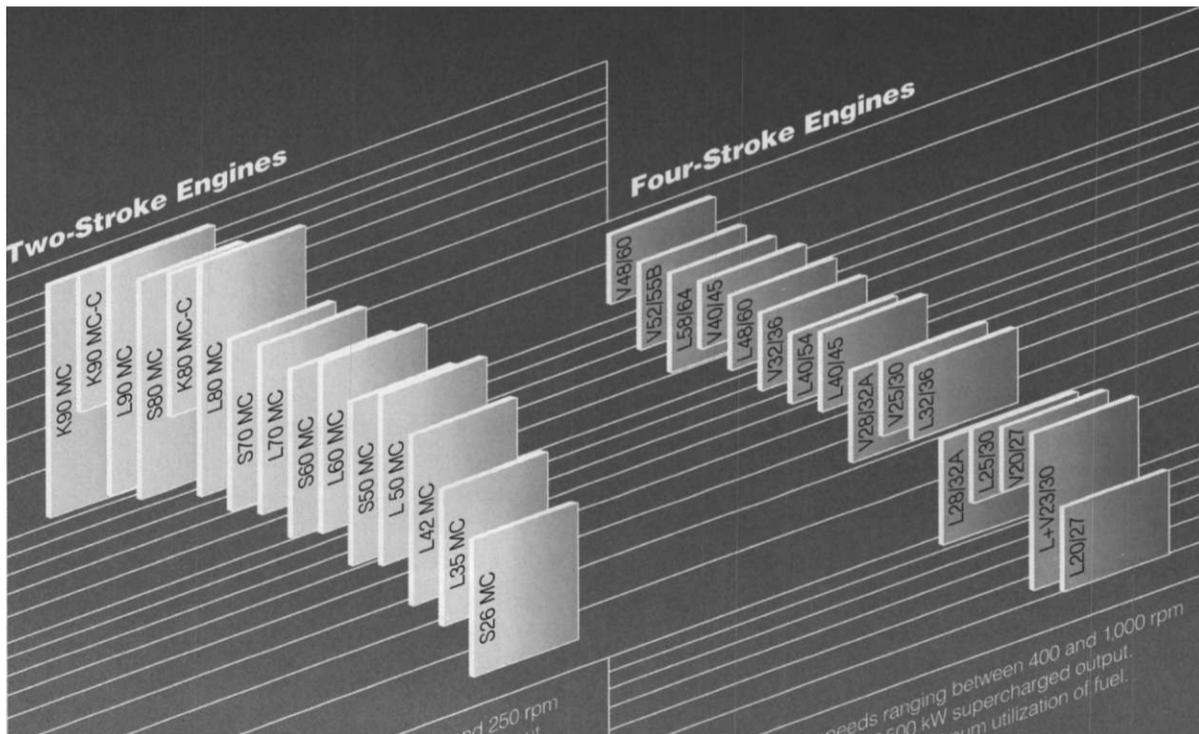
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Maritime Reporter/Engineering News



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SECONDHAND SHIPS:

Market Sector Prospects And Investment Options During The 1990s

For the investor looking at rates of return from the secondhand ship market, the 1990s should see major changes in the fortunes of players working the different fleet sectors. Taking the return generated on both trading profits (defined as time charter revenue less operating expenses) and asset appreciation, it is foreseen that tanker investments could be transformed from 1993 onwards with the rate of return indicators moving these vessels from among the least to the most impressive performers. In the dry sector, the most consistently impressive returns emanate from the specialist refrigerated cargoship (reefer) sector. Elsewhere, after a period of early promise, returns deteriorate.

Drewry Shipping Consultants' report, *Secondhand Ships: Market Sector Prospects and Investment Options during the 1990s*, examines the performance of 20 ship age/size/type permutations over a five year investment cycle and has developed the relative rankings shown in Table 1.

Fundamental to the development of the rankings for different secondhand ship investment options is the report's assessment of likely developments in key market sectors and their impact on supply/demand, freight rates and secondhand ship values. In essence, these can be summarized as:

• **Dry bulk carriers:** A fairly tight supply/demand picture is envisaged though the imbalance could widen as the decade progresses. There will be strong upward operating cost pressures and continuing firmness in newbuilding prices. In the Handy and Handymax classes (25-50,000 dwt), older tonnage offers

the better level of returns. More modern units, which are relatively scarce and tend to offer greater multi-purpose/neo-bulk flexibility, tend to command premium values yet their earnings potential is strongly influenced by the downtow from the older vessel sector. For the Panamax class (50-80,000 dwt), the trend is reversed mainly on account of the narrower earnings differentials with both five- and ten-year-old ships possessing fuel economy features. The Cape sector (around 120-140,000 dwt) is less impressive. Here, values will be influenced by questions of quality. On the earnings side, one of the key problems is that the only regular supply of open tonnage (which is crucial in determining freight rates) is the aging fleet element which is currently the subject of so much concern.

• **Tankers:** For the investor looking at secondhand tanker options during the 1990s the vital factor will be age concern. In deadweight tonnage (dwt) terms, virtually 50 percent of the fleet of 10,000+ dwt lies within the 15- to 20-year-old age bracket with much of this being of million barrel or VLCC capacity. In the near to medium term it is expected that the market's supply/demand imbalance will begin to improve as many of the less desirable units are disposed of. After some asset value depreciation, therefore, the scope for later re-

turns on quality tonnage looks impressive.

• **Other ship types:** Of the dry cargo options, the highest rankings are achieved by reefer vessels. However, this is a tightly knit market. Well maintained, pallet friendly types could prove to be a lucrative investment vehicle provided that the operator can meet the demanding requirements of the trade.

The conventional general cargoship ('tweendecker) sector is and will remain a vast trading sector although the erosion of opportunities by containerships (both line haul and feeder) will push these vessels more and more into minor bulk or peripheral markets. The crucial factor, however, will be the recognition that 'tweendecker trading is now very much a regional, niche market operation.

Simple economics also ensure that the small ship end of the dry cargo market is a specialized niche market operation. Its competitive nature also ensures that it will not be a huge profit center.

Among the other ship type categories are found the specialist areas where for operational and other reasons the speculative investor is unlikely to venture.

These include gas, liquid chemicals and container ships. In the gas sector, activity would be with LPG ships. Here the market is likely to weaken until mid-decade. The liquid chemicals sector has undergone a good deal of rationalization over the last couple of years with the result that sale and purchase activity is likely to be limited for some time to come. Values, therefore, should remain stable. For unitized tonnage, market improvements are

expected to focus primarily on the post-1995 period with values remaining reasonably stable in the interim. However, the potential for roll on/roll off (RO-RO) types is seen as the least impressive element in this sector.

In addition to these market sector considerations, *Secondhand Ships: Market Sector Prospects and Investment Options during the 1990s*, also provides an assessment of the other key considerations that a prospective investor in secondhand ships has to take into account. Included among these topics is a guide to owner's buying rationale, the factors that help determine individual ship prices and the nature of the sale and purchase transaction itself (documentation, finance, etc.). An insight is provided also into the continuing costs that have to be recovered once a purchase has been made. Finally, the report contains an appraisal of market and price developments since 1980 which offers insights into key market influences and their impact as well as providing a starting point for assessing the scale of up and downside levels of risk.

For further information, contact: Drewry Shipping Consultants Ltd., 11 Heron Quay, London E14 4JF; telephone 071-538 0191; telex 21167 (HPDLLN G).

Table 1. Relative Secondhand Ship Investment Rankings

Year Purchased (sold year +1 to +5)	Years	'91	'92	'93	'94	'95	Avg.
Crude Tanker (80,000 dwt)	5	14	12	1	2	2	1
Crude Tanker (125,000 dwt)	15	19	17	3	1	1	2
Reefer (350-450,000 cu.ft.)	10	1	2	7	7	6	3
Crude Tanker (80,000 dwt)	10	20	15	2	3	3	4
Bulk Carrier (Handy)	10	2	1	6	9	10	5
Bulk Carrier (Panamax)	5	3	3	8	8	8	6
Product Tanker (40,000 dwt)	5	15	9	4	4	4	7
Product Tanker (60,000 dwt)	5	9	8	5	6	5	8
Bulk Carrier (Handymax)	10	5	4	10	10	11	9
Bulk Carrier (Panamax)	10	6	7	11	11	9	10
Crude Tanker (250,000 dwt)	15	18	18	9	5	7	11
Tweendeck (15-17,500 dwt)	5	4	5	13	14	17	12
Tweendeck (15-17,500 dwt)	10	7	6	14	13	14	13
Short Sea Dry (3,500 dwt)	5	11	9	12	12	13	14
Bulk Carrier (Cape)	5	10	14	17	15	12	15
Tweendeck (15-17,500 dwt)	5	8	11	16	17	16	16
Short Sea Dry (3,500 dwt)	10	12	13	15	16	18	17
Bulk Carrier (Handy)	5	13	16	18	18	19	18
Bulk Carrier (Cape)	10	16	20	20	19	15	19
Bulk Carrier (Handymax)	5	17	19	19	20	20	20

Based on annual averages of rates of return for purchase year and resales in years +1 through +5. Period average is the average of the annual average data series.
Source: Drewry Shipping Consultants td.

Guide On Tanker Fatigue Strength To Be Published By ABS

The "Guide for the Fatigue Strength Assessment of Tankers," plus related software is scheduled to be published by the American Bureau of Shipping (ABS) this month.

The intention of the guide is to assist ship designers and owners in combating stress fractures in the high-strength steel increasingly used in vessel construction.

The associated software was developed by **Donald Liu**, ABS senior vice president.

Level Of World's Idle Tanker Tonnage Climbs

The level of world idle and laid-up tanker tonnage is rising, with the recent tonnage amount totaling 10.7 million dwt versus 4.4 million dwt in May 1991. Idle tonnage includes vessels that are under repair, semi laid-up or otherwise inactive.

The actual amount of laid-up tonnage fell during this period from 3.5 million dwt to 3 million dwt, while idle tonnage surged from 0.9 million dwt to 7.7 million dwt.

Low freight rates, falling secondhand values and increasing upgrading/operating costs are some of the international market conditions causing the growth in idle tanker tonnage.

While the volume of ships being scrapped has increased recently, many tankers that are candidates for scrapping are continuing to be used in trade due to the willingness of some oil companies to utilize sub-standard vessels.

Sheehan New Director Of CG Pollution Funds Center

The new director of the Coast Guard's National Pollution Funds Center is **Daniel F. Sheehan**, who succeeds Rear Adm. **Richard A. Appelbaum**. Established as an oil cleanup and compensation fund, the center was set-up as a requirement of the Oil Pollution Act of 1990 (OPA 90).

Formerly the associate program director of marine safety, security and environmental protection, Mr. **Sheehan** also chairs the interagency coordinating committee on oil pollution research, which was also established under OPA 90.

Admiral **Appelbaum** will be reassigned as chief of the office of law enforcement and defense operations at Coast Guard headquarters in Washington, D.C.

Electronics Update

Ashtech Ranger Receiver: Compact GPS Solution

The Ashtech Ranger™ GPS receiver and its provided software is a complete point-positioning system for GIS location and route mapping over a wide range.

Offered by Ashtech, Inc., a leading manufacturer of high precision GPS receiver systems headquartered in Sunnyvale, Calif., the Ashtech Ranger uses the same "All-In-View" dedicated 12-channel C/A code tracking features of the Ashtech M-XII Receiver. The Ranger was specifically developed to meet the needs of the GIS professional. The unit continuously tracks up to 12 satellites simultaneously on 12 separate and parallel channels. Since satellite range information can be



The Ashtech Ranger GPS receiver.

viewed simultaneously, any oscillator offset is accurately and efficiently removed. The Ranger is not a sequencing receiver.

Supplying accuracy of 25 meters or less SEP, the Ranger provides entry of 99 waypoints from either the keyboard or via data link for

waypoint navigation features. Complete navigation information is displayed to provide course-to-destination, time-to-destination, cross-track error, speed-over-ground and heading.

The receiver is lightweight and measures 3.9 inches high by 8.5 inches wide by 8 inches deep, making it easily portable and mountable.

Besides its GPS product line, Ashtech has a fully equipped GPS Training Center in Sunnyvale. The company offers a four-day training program and advanced training courses as well.

For free literature detailing Ashtech GPS receivers and training programs,

Circle 66 on Reader Service Card

HMS Marine Introduces Halon Containment Curtain

HMS Marine Hardware, Inc., of Valley Stream, N.Y., recently intro-

duced its Halon Containment curtains for shipboard use.

After halon is released during an emergency, the gas must be contained within the area of the fire in order for it to be properly extinguished and to avoid its coming into contact with crewmen not wearing protective breathing apparatus.

The HMS Quick-Release Ventilator Curtains for ship's topside (exterior) grills have been designed to act as effective barriers against halon or other gasses passing through a ship's ventilation system.

Made of fire-resistant coated fiberglass cloth, the Halon-containment curtains are well suited to exterior usage as they are also resistant to mildew, fungus and bacteria. HMS Marine reports that the curtains are easily washable by wiping and will not rot, shrink or stretch.

To receive free literature about HMS Marine Hardware's new Halon-containment curtains,

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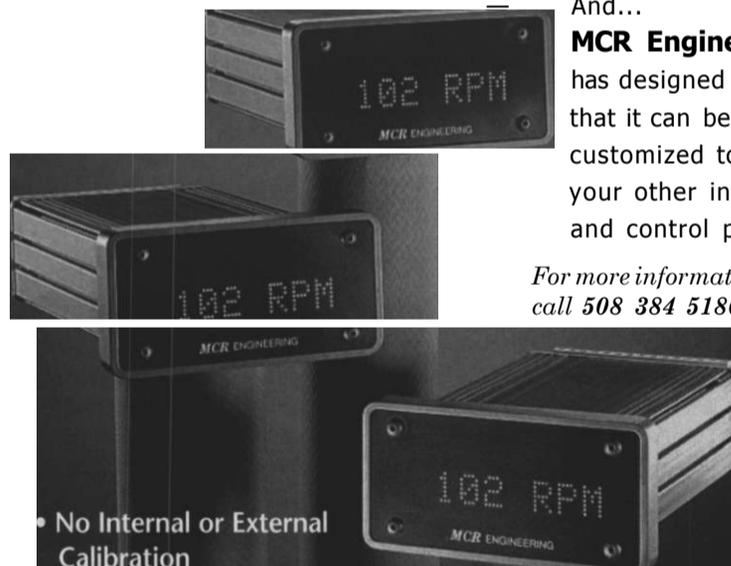
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MarAd: U.S. Ports Can Handle Rising Coal Exports

In its recently released study, "Existing and Potential U.S. Coal Export Loading Terminals," the U.S. Maritime Administration (MarAd) stated its confidence in the ability of U.S. ports to handle the predicted growth in U.S. coal exports over the next 20 years.

U.S. Energy Information Administration estimates that the nation will be exporting 245 million tons of coal by 2010 were compared to a projected terminal capacity of 399 million tons. The increase in U.S. exports is based on the continued sharp reductions in output from coal mines in Europe and a growing international demand for electricity.

The MarAd study noted that since 1988 the United States has a proven record as an international market swing supplier, allowing buyers to purchase large amounts of coal on short notice.

North Sea To Black Sea Waterway Set To Open

The opening of the Main/Donau Canal on September 25, 1992 will mark the completion of the long-awaited Rhine-Main-Danube connection, a continuous and permanent modern inland waterway route that will allow barges and river-seagoing vessels to make the 4,500-kilometer (2,755-mile) direct passage between the North Sea and Black Sea.

Annual traffic between east and west is predicted to increase to 22 million tons a year, from a current level of 9 million tons. Current Traffic between northern and southern Europe through the waterways system amounts to 51 million tons a year.

However, some waterway traffic restrictions will be necessary due to channel size, bridge height restrictions, canal locks and high and low water conditions on the River Danube.

The Rhine corridor is the preeminent, inland commercial waterway system, carrying 330 million tons of cargo per year. German authorities are planning to improve their canal systems so that the Rhine will be linked to the Elbe, east Germany and Poland, while the French are interested in connecting the Rhone river to the upper Rhine.

Norgren Offers Brochure On Compressed Air Service Product Line

A free brochure is available from Norgren, Littleton, Co., highlighting its Designer II Series Modular System for air preparation products and directional control valves for compressed air service.

According to company literature,

this newest line of Norgren filters, regulators, lubricators and valves features a modular design that allows conventional in-line installation, or modular installation using pipe adapters and mounting inserts. The Designer II Series Modular System is available in 1/4-, 3/8- or 1/2-inch pipe size.

Norgren is a leader in the manu-

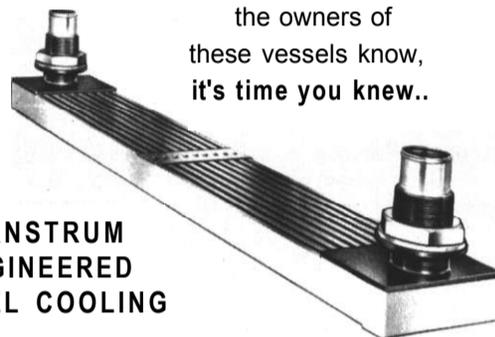
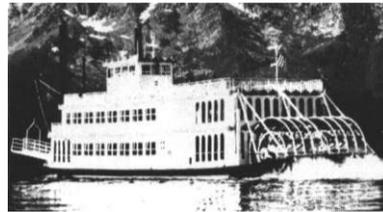
facture of pneumatic filters, regulators, lubricators, valves, LINTRA rodless cylinders, automation systems, dryers, push-in fittings and accessories.

For a free copy of Norgren's brochure,

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Box Crane Rental Rates Rise In San Francisco

As of July 1, 1992 the San Francisco port commission approved a 10 percent increase in container crane rental rates from \$300 to \$330. Crane maintenance charges have also increased from \$85 to \$93.50.



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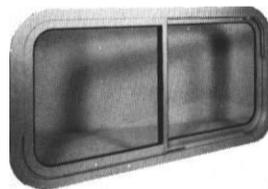
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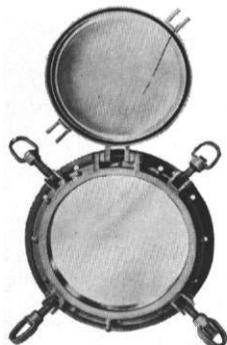
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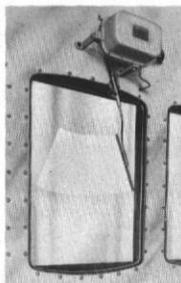
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Drawing of the Finnish National Board of Navigation's multipurpose icebreaker, scheduled for delivery from Finnyards in January 1994.

Finnyards Receives 2nd \$130 Million Multipurpose Icebreaker Order

Finnyards, Ltd., of Rauma, Finland, has received a FIM (Finnish Mark) 560 million (\$130 million) order from the Finnish National Board of Navigation for a second 116-meter (381-foot) long, 26-meter breadth (85.3-foot) multipurpose icebreaker to be delivered in early 1994.

This ship and its sistership ordered in October 1991 represent a completely new design of multipurpose icebreaker. The hull combines the features of two vessels with very different operational requirements, an icebreaker and an ocean-going offshore vessel. Extensive laboratory model testing conducted at the Technical Research Center of Finland and the Helsinki University of

Technology proved the success of the design.

The vessel features a large open after-deck similar to that found on offshore supply boats. This deck area has been strengthened to carry a variety of heavy equipment, such as for the laying and repairing of cables and for handling anchors and cargoes. In its Arctic icebreaker configuration the vessel has a 26.2-foot draft at 3,840 dwt and for offshore operations a draft of 27.6 feet at 4,725 dwt.

The ship's diesel-electric propulsion system is centered around a "father-son" main engine arrangement consisting of two Wartsila Vasa 16-V 32s and two Wartsila Vasa 12-

V 32s for a total output of 21 MW, 28,600 hp. The engines power two of Aquamaster-Rauma, Ltd.'s largest stern azimuthing propeller units, each with a shaft power of 7.5 MW and giving the icebreaker a top speed of 16 knots and a bollard pull of 200 tons. The units provide the icebreakers with excellent steering characteristics in ice and open water. For offshore work the vessel has three transverse bow thrusters and a dynamic positioning system from Simrad of Norway. Det norske Veritas has certified the ship as a tug, supply vessel and polar class 10 icebreaker.

Upon completion, the Ugland Group will utilize the multipurpose icebreakers in the North Sea or Arctic waters for approximately six months each year from the beginning of May. The vessels will act as supply and support vessels for oil-drilling platforms, cable-laying and for other offshore work.

Both icebreakers will sail under the Finnish flag and be operated by Finnish crews. In the summer months, the crews will be supplemented by offshore operations experts employed by Ugland.

The Ugland Group is very much involved in engineering design work, as well as research and development for the oil and gas industries and navigation in general. The group has been closely linked to the development of Finland's multipurpose icebreaker program.

For free literature about the services and facilities available from Finnyards,

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For additional information about Aquamaster-Rauma's azimuthing thrusters or other marine product line,

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2ND FINNISH GOVERNMENT ICEBREAKER Equipment List

Main Engines.....	Wartsila
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Bowthrusters.....	Brunvoll
Generators.....	ABB Stromberg
Engine Controls.....	Simrad
VHF Radios.....	Skanti
SSB Radio.....	Sait
Radar.....	Selesmar
Gyro Compass.....	Sperry
Loran.....	MLR Electronique
Dynamic Positioning System.....	Simrad

Norshipco Awarded \$3.2 Million MarAd Contract

A \$3.2 million contract for the deactivation of the Ready Reserve Force (RRF) breakbulk vessel Cape Horn was recently awarded to Norfolk Shipbuilding & Drydock Corporation (Norshipco) by the U.S. Maritime Administration (MarAd). MarAd estimates that the work will be completed within 60 days.

In addition to preparing the ship for its return to a MarAd reserve fleet lay-up facility, deactivation work will also include repairs needed to meet classification society specifications and regulations.

Boats & Barges

Leevac To Build Casino Boat To Rodney E. Lay Design

Jacksonville, Fla., naval architects and marine engineers Rodney E. Lay & Associates is completing construction detail drawings for a new 210-foot sidewheel casino vessel which will be owned and operated by Players International and Southern Illinois Riverboat Casino Cruises in Metropolis, Ill. The sidewheeler will be built at Leevac Shipyards, Jennings, La., and will meet U.S. Coast Guard Subchapter "H" passenger vessel requirement. The delivery of the vessel is scheduled for February 1993.

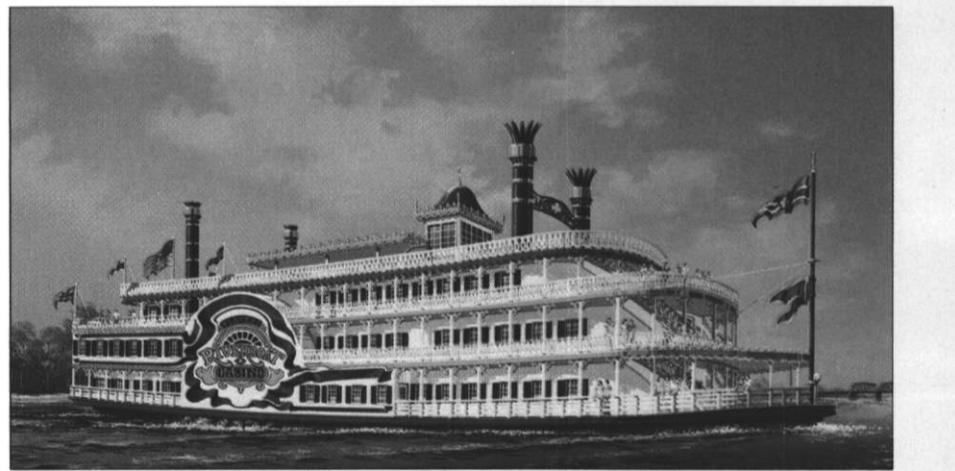
The sidewheeler will have casinos on the main, boiler and hurricane decks, and a canopied fourth deck. All offices, stores, hard and soft count areas and major deck

machinery spaces are located below the main deck.

Main propulsion is by two MTU 12V 183-TE62 diesels, rated at 735 hp at 2,000 rpm, with ZF BW255 reverse reduction gears. Maneuverability is supported by a Schottel SST-170-T, 400-hp bow thruster with MTU 12V 183-AA91 thruster engine.

The main generating plant consists of two MTU 8V 396-TE-54, 720-kw generators. Lo-Rez vibration isolators are utilized with all major machinery. Matthews will supply a three-station steering system.

Air conditioning for the casino boat consists of two Carrier 105.8 ton A/C units with twin P/S chill



Artist's conception of the Players Riverboat Casino, under construction at Leevac Shipyards in Jennings, La., and designed by Rodney E. Lay & Associates, Jacksonville, Fla.

water/hot water circulating systems. A fully automatic boiler shares the circulation system for heating.

Interior design is by Direction In Design of St. Louis and gaming equipment and layout by IGT.

Other riverboat casino vessels designed by Rodney E. Lay & Associates include: the 190-foot Casino Rock Island, also built by Leevac Shipyards; the 222-foot "Casino Cat"

Empress, built by Atlantic Marine (see article this issue); Mississippi Grand's moored 310-foot sternwheeler; and a 350-foot sternwheeler for Palace Station.

For free literature detailing the design services of Rodney E. Lay & Associates,

11
Circle 58 on Reader Service Card

Cover Story



The first of her kind, the SSC Radisson Diamond utilizes SWATH technology in order to offer a large stable platform, while minimizing propulsion noise and vibration.

Futuristic Radisson Diamond: 21st Century Cruise Ship Delivered By Finnyards

The \$125 million SSC Radisson Diamond, promoted as the revolutionary cruise ship concept of the 21st century because of her SWATH technology, was recently formally christened in London at week-long festivities. Ceremonies for the 354-foot, twin-hull luxury ship were held at the Greenwich Buoy on the River Thames. "Greenwich is where world time begins, and with the christening of this ship, we are celebrating the beginning of a new time in the world's cruise industry," said **Christian Aspegren**, president and co-founder of Diamond Cruise Inc.

Built by Finnyards Oy in Rauma, Finland, the Radisson Diamond is owned by Diamond Cruise Inc., a joint venture that includes shareholders Radisson Hotels International and Scudder, Stevens and Clark's New Europe Fund, both of the U.S.; Pohjola Insurance Co., Finnyards and Kansallis Banking Group, all of Finland; and Mitsui

OSK Lines, Nippon Life and Nippon Total Finance, all of Japan.

Dame **Kiri Te Kanawa**, the internationally renowned opera star, served as the ship's godmother. Other important dignitaries at the christening ceremony included: **Juergen Bartels**, president of Carlson Hospitality Group Inc., the parent company of Radisson Hotels International; **Curtis L. Carlson**, founder and co-chairman of Carlson Companies, Inc.; and **Ari Tolppanen**, chairman of the board of Diamond Cruise Inc.

The ship's summer itinerary offers cruises in the Baltic and Mediterranean. It will then embark on its inaugural Atlantic Crossing from Genoa, Italy, to Ft. Lauderdale, Fla., recreating the voyage of Columbus on the 500th anniversary of the historic event. The homeport will be San Juan, Puerto Rico, where it will offer Caribbean cruises of four, five and seven days.

"We are most excited to mark the expansion of Radisson Hotels International into the cruise business with such a premier project," said Mr. **Bartels**. "The SSC (Semi-Submersible Craft) Radisson Diamond is destined to redefine the standard of excellence in the 'ultimate deluxe' segment of the cruise industry," he added.

According to Mr. **Bartels**, the vessel's stability is achieved by its Small Waterplane Twin-Hull (SWATH) design, which offers superior seaworthiness. The propulsion machinery is placed in the ship's submerged hulls beneath the waterline, minimizing ship vibration and eliminating most of the engine and propeller noise.

The 20,000-ton twin-hull Radisson Diamond has a unique four-stabilizer fin design and is 420 feet long, 103 feet wide and has a draft of 26 feet. Passenger capacity is 354 with a crew of 192. The four stabilizer fins, supplied by Brown Brothers, are some of the largest ever made, and, in combination with a KaMeWa fault tolerant control system, provide independent control of pitch, roll and heave. KaMeWa also supplied the ship's two controllable pitch propellers.

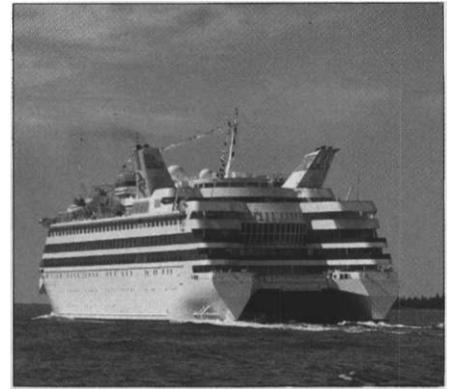
There are two propulsion plants comprising Wartsila Vasa 6R32E and Wartsila Vasa 8R32E diesel engines utilizing heavy fuel 380 cSt/50 degrees C.

Auxiliary power is provided by one Wartsila Vasa 12V22HF-D diesel generator, rated at 1,740 kw, and one Wartsila Vasa 8R22HF-D, rated at 1,160 kw.

The ship features 177 luxury class cabins, most with private balconies that overlook the sea.

The Radisson Diamond offers complete facilities for corporate conferences and incentive groups. Of particular interest to business executives is the ship's state-of-the-art communications technology, such as the direct-dial telephones, facsimile machines, computers, printers and the availability of satellite communication networking.

A 230-seat lounge called "Windows" located on the eighth deck at the bow offers a sweeping panoramic view of the ocean. Besides the Grand Dining Room, there is also "The Grill," a 110-seat indoor/outdoor



Stern view of the uniquely shaped Radisson Diamond.

specialty restaurant overlooking the sun deck.

Other recreational facilities aboard include a 40-person casino, library, underwater viewing room, large outdoor swimming pool, jacuzzi, spa and fitness center, saunas, golf driving range and workout room. A special hydraulically operated floating marina at the stern offers a staging area for water recreational sports.

For free literature detailing the vessel construction capabilities of Finnyards,

Circle 73 on Reader Service Card

RADISSON DIAMOND Equipment List

Main engines (2)	Wartsila Diesel
Generators	Wartsila Diesel
CP propellers	KaMeWa
Gears	Renk Tacke
Bow thrusters	Brunvoll
Fin stabilizers	Brown Brothers
Boilers	Aquamaster-Rauma
Automation system	ABB Stromberg
Radars/doppler log	Krupp Atlas
Lifeboats/tenders	Harding Safety
Freezing/coolong plant	Sabroe
Fire rlnnrs	1. Saains
Evaporators	Osmotec/Serck Como
Garbage handling system	Norsk Hydro
Separators	Alfa-Laval
Mooring & anchor winches	Aquamaster-Rauma
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Circle 238 on Reader Service Card
Maritime Reporter/Engineering News

J. L. Sullivan Retires As Smit (US) Chairman, Receives Dutch Knighthood

At a ceremony in Smit International headquarters, Rotterdam, **John L. Sullivan** formally retired as chairman of the board of directors of Smit International (Americas), Inc., the company's American establishment in Houston and New York. Earlier this year, Mr. Sullivan delegated his duties to **J. W. Heldring**.



John L. Sullivan (left), retiring chairman of Smit International (Americas), Inc., and Dr. J. van Tiel, of the Netherlands Ministry of Transport & Public Works.

In recognition of his 40 years of service to Smit International Group in the U.S., Mr. Sullivan was knighted as Officer in the Order of Oranje-Nassau. The ornaments which belong to this Royal decoration were pinned on during a reception by Dr. J. van Tiel, director-general Scheepvaart en Maritieme Zaken, from the Ministry of Transport and Public Works in the Netherlands.

Flender Werft Delivers 1,724-TEU Boxship

Flender Werft AG in Lubeck, Germany, recently marked its 75th anniversary with the delivery of the 1,742-TEU containership Santa Victoria to Ivaran Shipping A/S of Lysaker, Norway. She is the sixth ship built in the Flender 1600 Series.

The Santa Victoria will sail for P&O Containers Ltd. under her charter name Muscat Bay on the Europe-Southeast Asia route.

The boxship has an overall length of 597 feet, breadth of 93 feet and draft of 38 feet. The 30,000-dwt vessel is fitted with four cranes. Seven hundred and ninety-four TEUs of her 1,742-TEU capacity is taken in cell frames in the cargo holds.

Propulsion is supplied by a long-stroke crosshead model 7L60MC MAN B&W Diesel engine, with an output of 15,488 hp at 111 rpm, which directly drives a controllable-pitch propeller. The vessel burns 37.2 tons of fuel per day at a speed of 19 knots at container draft.

Other vessels on order at Flender Werft include two 12,000-dwt RO/RO car transport ships scheduled for delivery in the middle and end of next year, respectively.

For free literature detailing the shipbuilding facilities of Flender Werft,

Circle 222 on Reader Service Card

July, 1992

Lakes Shipping Affected By Low Water Levels

Ships on the Great Lakes are being prevented from loading to their full capacities because of low water levels caused by the drought in the mid-1980's.

While lake levels have regained

most of the 17 inches of depth they lost to the heat from 1986 to 1988, vessels are still being light loaded, said **Glen Nekvasil**, communications director for the Lake Carriers' Association, Cleveland, Ohio.

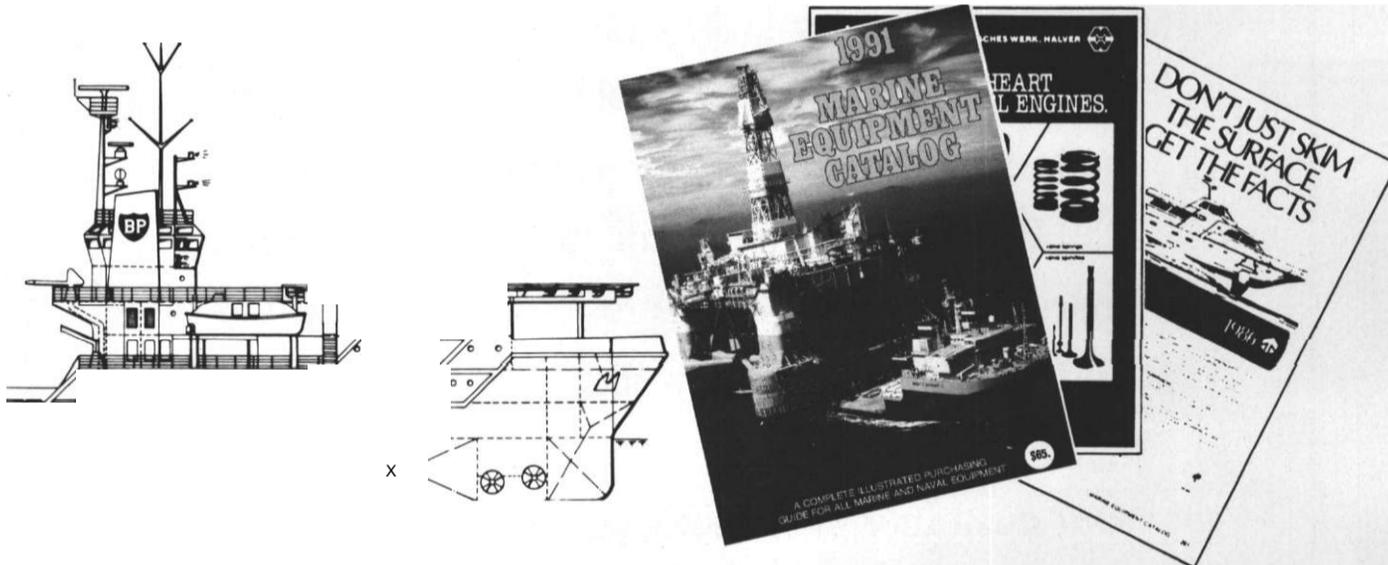
Association vessels are limited by the Soo Lock, which has a depth of approximately 27 feet, 4 inches for vessel loadings. The result is a 9-inch shortfall which should improve

by mid-summer, Mr. Nekvasil added.

The association's annual report of 1991 shows that a 1,000-foot vessel loses 267-tons of cargo for every one-inch draft reduction. Even if the average water loss is just 6 inches, this equates to 1,600 tons of lost cargo each trip, Mr. Nekvasil stated.

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IN CIRCULATION WORLDWIDE

MarAd Publishes Final Rule On Regulated Transactions

A final rule concerning regulated transactions involving documented vessels and other maritime interests has been published in the Federal Register by the U.S. Maritime Administration (MarAd).

The MarAd rule, Docket No. R-125, makes final regulations implementing statutory changes that became effective on January 1, 1989 for approval of vessel transfers to noncitizens and noncitizen financing of U.S.-documented vessels. A notice of proposed rulemaking and two interim final rules were published in the Federal Register and the significant comments were received and considered in developing

this final rule.

The regulations govern the procedures for obtaining statutorily required approval for the mortgaging, charter, sale, etc., of U.S.-documented vessels to noncitizens, and approval for noncitizens to hold preferred mortgages on documented vessels or act as trustees. In many cases, the regulations eliminate the need to apply for these approvals and should facilitate the process for

those approvals still requiring applications.

For additional information contact **Robert J. Patton Jr.**, deputy chief counsel, Maritime Administration, Washington, D.C. 20590; (202) 366-5712.

Marine Gears Appoints New Marketing Manager

Marine Gears, Inc., of Greenville, Miss., recently announced the promotion of **Gene Pigg** from customer service manager to marketing manager.



Gene Pigg

Mr. **Pigg's** responsibilities include formulating marketing strategies as well as continued outside sales efforts. He started work with Marine Gears in 1986 as head of shipping and receiving.

Marine Gears, Inc., is a designer and manufacturer of Haley Marine Gears and Clutches.

Scanfreight Opens New Virginia Beach Office

Kearny, N.J.-based Scanfreight, Inc., a unit of Scanfreight, Sweden, has opened a branch office in Virginia Beach, Va. The new office will service customers in Virginia, Maryland and North Carolina. Scanfreight currently has field offices in 14 U.S. cities.

The address of the company's new office is: 5820 Ward Court, Virginia Beach, VA 23455; telephone: (804) 363-2579.

MarAd Appoints LLOYD New Central Region Trade Specialist

The U.S. Maritime Administration (MarAd) recently appointed **Douglas Lloyd** as its new maritime trade development specialist for the central region headquarters in New Orleans.

Mr. **Lloyd** has been with MarAd since he was recruited as the U.S. Department of Transportation's maritime program specialist for the Great Lakes region in 1985.

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Chesapeake Specialty Products, 5055 Northpoint Blvd., Baltimore, MD 21219
Ervin Industries, Inc., 3893 Research Park Drive, P.O. Box 1168, Ann Arbor, MI 48106-1668

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CarrierTranscold, P.O. Box 4805, Syracuse, NY 13221
Maritime Services Corp, 3457 Guignard Drive, Hood River, OR 97031
Stal Refrigeration AB, Butangsgatan 16, S-60187 Norrkoping, SWEDEN
Yorkintl, P.O. Box 1592-083G, York, PA 17405

BALLAST

Chesapeake Specialty Products, 5055 Northpoint Blvd., Baltimore, MD 21219
Genstar Stone Products, Executive Plaza IV, HuntValley, MD21031
Mineral Research & Recovery Inc,P.O. Box986, Sonoita, AZ85637

BARGE BUILDING

Conrad Industries, P.O. Box790, Morgan City LA70381
Maxon, South Boundary Street, P.O. Box69, Tell City, IN 47586
Zidell Marine Corp.,3121 SW MoodyAve, Portland, OR 97201

BARGECOVERS

Syntechinics Inc., FRPdiv. 700 Terrace Lane, Paducah, KY42003

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McDonough Marine Service, 2300 Surekote Road, New Orleans, LA 70117
Zidell MarineCorp, 3121 SW MoodyAve,Portland OR97201

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Orkot Engineering, 2535 Prairie Road-Unit D, Eugene, OR 97402
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Marine Electric RPD, Inc., 50 Carol St, P.O. Box 1135, Clifton, NJ 07014-1135
Norcontrol A/S, P.O. Box 1024, N-3191 Horten, NORWAY
Robertson Marine Systems, 3000 Kingman St, Suite207, Metairie, LA 70006
Row Technology, P.O. Box265, Littlestown, PA17340
Siemens Energy & Automation, Inc., Systems Div, Marine Systems No. America (A23N),100TechnologyDr,Alpharetta,GA 30202
Teleflex Inc., 771 First Ave, King of Prussia, PA 19406

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Hagglunds Inc, Marine Div. Headquarters, 50 Chestnut Ridge Road, Montavale, NJ 07645

Liebherr-WerkNenzing GES.mbh, P.O. Box 10, A-671 ONenzing, AUSTRIA
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FENDERING SYSTEMS/BUOYS-Dock & Vessel

Kahlenberg Bros. Co, P.O. Box 358, Two Rivers, WI 54241
Milligan Marine Supply Inc., 5832 Harvey Wilson, Houston, TX 77020
Rowe Bumpers, Conveyors&CasterCorp, 3501 Detroit Ave, Cleveland, OH 44113
Seaward International, Inc, Clearbrook Industrial Park, P.O. Box98, Olearbrook,VA22624
Solidur Plastics Co, 200 Industrial Dr., Delmont, PA 15626
Standard Refrigeration Co., 2050 N. Ruby, Melrose Park, IL 60160
Ultra Poly Inc, 2926 South Steele, Tacoma, WA 98409
Viking Fender Co., 50 Church Street, Sea Bright, N J 07760

FIBERGLASSGRATING

International Grating, Inc, 7625 Parkhurst, Houston, TX77028

FIBER OPTIC SYSTEMS

AT&T, Cables System/Fiber Optic Div, 111 Madison Avenue, Morristown, NJ 07962

FIREDETECTIONSYSTEMS

Autronica Marine A/S, Drammensveien 126, N-0277Chso2, NORWAY
Unitor Ships Service, Inc,2375 W. EstherSt, Long Beach, CA 90813

FRICTION COMPONENTS/PARTS

Champion Friction Co. 845 McKinley St, Eugene, OR 97440

FUELADDITIVES,CONDITIONING

Hammonds Fuel Additives, POBox38114407, Houston, TX77238-8114

GALLEY EQUIPMENT

Cospolich Refrigerator Co, 949 Industry Rd, Kenner LA 70062
Forma Kool, 28245 Kehrigh St, Mt Clemens, MI 48045
Gaylord Industries, 10900 S W Aveyi St, P.O. Box 1149, Tualatin, OR 97062

GANGWAYS, LADDERS

Coast Marine & Industrial Supply Inc, 398Jefferson St, San Francisco, CA 94133
Sea Systems Inc., 65 Avco Road, Ward Hill, MA 01835
Wooster Products Inc, 1000 Spruce St, P.O. Box 896, Wooster, OH 44691

GENERATORS

Tech Systems, 401 Watertown Rd, Thomaston, CT06787

GROUND FAULTPROTECTION & LOCATION EQUIPMENT

Bender, inc., 400 Gordon Drive, Bldg. 501, Exton PA 19341

KEATEXCHANGERS

Alfa-Laval Separation Inc, 955 Meams Rd, Warminster, PA 18974
Beaird Industries Inc, P.O. Box31115, Shreveport LA71130
Tranter Inc, Old Burk Road, Wichita Falls, TX 76307

HORNS/WHISTLES

Kahlenberg Bros Co, P.O. Box 358, Two Rivers, WI 54241

HYDRAULICS

AeroquipCorporation, 3000 Strayer,P.O.Box631, Maumee, OH 43537-0631
Cunningham Marine Hydraulics Co, 201 Harrison St, Hoboken NJ 07030
Del Gavio Marine Hydraulics Inc, 619 Industrial Rd, Carlstadt, NJ 07072

INCINERATORS

A/S Vesta, P.O. Box548, DK-9100 Aalborg, DENMARK. U.S. Agent: Aalborg Ciserv Houston, Inc, P.O. Box 906, AngletonTX 77515

INSULATION

Soundcoat Company, 1 Burt Drive, Deer Park, NY 11729

JETPROPULSION SYSTEMS

North American Marine Jet, P.O. Box 1232, Benton, AR 72015

JOWER—Waferti^Doa—Pareirig—CeigSystnr-Oeckirig

GEC-Marconi Electronic Systems Corp, 550 S. Fulton Ave, Mt. Vernon, NJ 10550
IMAC AB, Berga Alle 1, S-252 55 Helsingborg, SWEDEN
U.S. Rep: Hopeman Brothers, Inc, P.O. Box820, Waynesboro, VA22980
Jamestown Metal Marine Sales, Inc, 4710 Northwest Second Avenue, Boca Raton, FL33431
Marine Accommodations Inc, 8535-3 Baymeadows Road, Suite 140, Jacksonville, FL 32256

Maritime Services Corp, 3457 Guignard Drive, Hood River, OR 97031

KEEL COOLERS

R.W. Femstrum & Co, 1716 Eleventh Ave, Menominee, MI 49858
Kahlenberg Bros. Co, P.O. Box358,Two Rivers, WI 54241
The Walter Machine Co, Inc, 84-98 Cambridge Avenue, Jersey City, NJ 07307

LIFEBOATS/RAFTS

Zodiac of North America, P.O. Box 400, Stevensville, MD 21666

Willard Marine Co., Inc., 1250 N. Grove St., Anaheim, CA 92806

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights

ACR Electronics, Inc., 5757 Ravenswood Rd., P.O. Box 5247, Ft. Lauderdale, FL 33310-5247

Archway Marine Lighting, 4501 Swan Ave., St. Louis, MO 63110

Carlisle & Finch, 4562 W. Mitchell Ave., Cincinnati OH 45232

The L.C. Doane Co., P.O. Box 975, Essex, CT 06426

Nautilus Equipment Ltd., P.O. Box 66, Station M, Halifax, Nova Scotia B3J2L4, CANADA

Phoenix Products, 6161 N 64th St., Milwaukee WI 53218

UNEBUNDS

American Piping Products, Inc., 22 S. 9th St., New Hyde Park, NY 11040

Stacey/Fetterolf, P.O. Box 103, Skippack, PA 19474

LIQUID CARGO HEATERS

First Thermal Systems, Inc., P.O. Box 4756, Chattanooga, TN 37405

LIQUID OVERFILL PROTECTION SYSTEMS

E.R.L. Marine Products, P.O. Box 1026, New Albany, IN 47151-1026

LOGISTICS

VL Logistics Consultants, Inc., 3420 Bienville Blvd., Ocean Springs MS 39564

QED, 4646 N. Witchduck Road, Virginia Beach, VA 23455

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING

Del Gavio, 619 Industrial Rd., Carlstadt, NJ 07072

Global Maritime Services, 247 SW 33 Court, Ft. Lauderdale, FL 33315

Golden Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231

New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150

MACHINING—On Site Repair

Global Maritime Services, 247 SW 33 Court, Ft. Lauderdale, FL 33315

MARINE ACCOMMODATIONS

Directions in Design Inc, 633 Emerson, Suite 100, St. Louis, MO 63141

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

Jamestown Metal Marine Sales, Inc., 471 ONorthwest Second Avenue, Boca Raton, FL 33431

Marine Accommodations Inc, 85353 Baymeadows Road, Suite 140, Jacksonville, FL 32256

Maritime Services, 3457 Guignard Dr., Hood River, OR 97031

MARINE FURNITURE

Directions In Design, 633 Emerson, Ste. 100, St. Louis MO 63141

Jamestown Metal Marine Sales, 4710 North Second Avenue, Boca Raton, FL 33431

Marine Accommodations Inc, 85353 Baymeadows Road, Suite 140, Jacksonville, FL 32256

Maritime Services, 3457 Guignard Dr., Hood River, OR 97081

Wilson & Hayes, 1601 Eastlake Avenue, East, Seaside, WA 96102

MARINE SHIP MAINTENANCE

Arkton Corp, 1810 Chapel Ave. West, Chenyhi, NJ 08002

METAL PRODUCTS

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

Harrington Mey Fabrication, P.O. Box 410, 6720 M 89, Fennville, MI 49408

MOTORS

Tech Systems, 401 Watertown Rd., Thomaston, CT 06787

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS

Advar & Mainie Enterprises, Inc., 1725 Jefferson Davis Hwy, Airm 22202

Aero Nav Laboratories, Inc., 14-2911 2St, Colege Point NY 11356

Arctec O (shore), 578 E Enterprise St, Escondido, CA 92025

CDI Marine O, 9487 Regency Square BW, Suite 5(X), Jacksonville, FL 32225

CT Marine, 18 Chuch Street, Georgetown, CT 06829

Childs Engineering Corp, Box 333, Medfield, MA 02052

Crandall Dry Dock Engrs, Inc., 21 Pottey Lane, Dedham, MA 02026

Crane Consultants, 15301 First Ave S, Seattle, WA 98148

C.R. Cushing, 18 Vesey St., New York, NY 10007

Arthur D. Daiden, 3200 Ridgeway Dr., Suite 403, Metairie, LA 70002

Design Associates Inc, 14360 Chef Merteau Hwy, New Orleans, LA 70129

Designs & Rarras, 2611 Jefas Ct, Oa Vista Hwy, Ste. 3000, Arlington, VA 22202

C. V. Tech, 812 Live Oak Dr., Chesapeake, VA 23320

Encon Management & Engineering, 10101 S. P.O. Box 67760, Beaumont, TX 77706

GHM Inc., (Injustly Measurment Consistent), P.O. Box 1836, Newport News, VA 23601

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

The Glosten Associates Inc, 600 Mutual Life Bldg, 605 First Ave, Seattle, WA 98104

Morris Guralnick Associates, Inc., 130 Sutter Street, Suite 400, San Francisco, CA 94104

C. Raymond Hunt Associates, 69 Long Wharf, Boston MA 02110

Hydrocomp, Inc., 45 James Farm-Lee, P.O. Box 865, Durham, NH 03824

JH Inc, No. 4 Executive Campus, Culbert Blvd. & Route 70, P.O. Box 5031, Cherry Hill, NJ 08034

R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073

James S. Krogen, 1515 NW 7th St., Suite 124, Miami FL 33125

Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225

Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063

John V. McCollum, Inc., 1199 Long Point Road, Mt. Pleasant, SC 29464

McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454

John J. McMullen Associates, Inc., 1 World Trade Center, Suite 3000, New York, NY 10048

MacPherson Maritime Services, 141 Jefferson Ave., Westfield NJ 07090

Fendall Marbury, P.O. Box 2321, Annapolis, MD 21401

Marine Design & Operations, Inc., 226 Chestnut St., Roselle Park, NJ 07204

Marine Management Systems Inc., 102 Hamilton Ave., Stamford CT 06902

Marine Power Associates, 1010 Turquoise St., Ste 217, San Diego, CA 92109

Maritech, Seaciff, Bay Road, Newmarket, NH 03857

Maritime Design, Inc., 3020 Hartley Rd., Jacksonville, FL 32257

R.J. Melusi & Co., 71 Hudson St., New York, NY 10013

Nautical Designs, Inc., 2101 S. Andrews Ave., Suite 202, Ft. Lauderdale, FL 33316

Northern Marine, P.O. Box 1169, Traverse City, MI 49685

Ogden Government Services, 3211 Jeiman Drive, Fairfax, VA 22030

Olsen Marine Surveyors Co., P.O. Box 283, Port Jefferson, NY 11777

Omega Marine Engineering Systems, Inc., 11757 Katy Freeway, Ste 1100, Houston TX 77079

QED Systems Inc, 4646 Witchduck Rd., Virginia Beach, VA 23455

M. Rosenblatt & Son, Inc., 350 Boat Ljway, New York, NY 10013 and 667 MBSion St, San Francisco, CA 94105

Sargent & Herkes, 225 Baronne St., Suite 1405, New Orleans LA 70112

Sea School, 10812 Gandy Boulevard, St. Petersburg, FL 33702

Seaworthy Systems Inc., P.O. Box 965, Essex, CT 06426; 17 Battery Pl, New York, NY 10004; P.O. Box 975, Barnegat Light, NJ 08006; 2 Skyline Pl., 5203 Leesburg Pike, Suite 700, Falls Church, VA 22041; 1305 Franklin St., Suite 210, Oakland, CA 94612.

George G. Shaip, Inc., 100 Church St., New York, NY 10010(X)

R.A. Steam, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235

TIMSCO, P.O. Box 91360, Mobile AL 36691

NAVIGATION & COMMUNICATIONS EQUIPMENT

Anschutz S Company, One Madison St., East Rutherford, NJ 07073

AT&T, High Seas Dept., 412 Kemble Ave., Room C380, Morristown, NJ 07960

Aurora Mairé A, Drammensveien 126 N-2770 Oslo 2, NORWAY

Celnet Qxp, 400 Main St Stamford, CT 06901-3004

CDMSat Maritime Services, 9501 Bianto St., Washington DC 20024

EDCI Corporation, 2645 S 300 West St., Lake City, UT 84115

Electro Marine Systeme, 800 F. M. Date F., Ratway, NJ 07065

Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080

Hose McCann, 9 Smith St., Englewood, NJ 07631

Henschel, Inc., 9 Hoyt Drive, Newburyport MA 01950

IDB Aero-Nautical Communications, 15245 Shady Grove Road, Rockville, MD 20850

Kenrad LISACOIP, Marine Products Div, 2201 E. Domrquez St., Long Beach, CA 90810

Mackay Clommuicalions, 441 US Highway #1, P.O. Box 331, Eatontown NJ 07070

Marre Electric RPD, Inc., 50 Carol St., P.O. Box 1135, Cifton, NJ 07014-1135

Megapulse, Inc., 8 Preston Court, Bedford MA 01730-2380

Mobile Telesystems, Inc., 300 Professional Drive, Gaithersburg, MD 20879

Naval Electronics, 5417 JeView Circle, Tampa FL 33634

Norwegian Telecom, P.O. Box 6701, Oslo 1, NORWAY

Novatech, 820 Comorant St., Victoria, BC V8W 1R1, CANADA

Raytheon Marine Co., 46 River Road, Hudson, NJ 07051

Robertson Marine Systems, 3000 Kingman Street Suite 207, Metairie, LA 70006

SPD Technologies, 13500 Roosevelt Blvd., Philadelphia, PA 19116

Scania Marine Systems, P.O. Box 155, N-1411, Kottxtai, NORWAY

Simrad, 19210 3rd Avenue West, Lynnwood, WA 98036

Sperry Marine, Inc., 1070 Semite Trail, Charlottesville VA 22901

Standard Communications, P.O. Box 92151, Los Angeles, CA 90009

Summer Equipment Ltd, 24 West 4th Ave., Vancouver V5Y 1G3, CANADA

Timble Navi, 585 No. 1st Mary Ave, P.O. Box 3642, Sunnyvale, CA 97086

Waterway Communications System, Inc., 453 E. Park Pl., Jeffersonville, IN 47130

NOZZLES

Harrington Metal Fabrication, P. O. Box 410, 6720 M 89, Fennville, MI 49408

OIL—Marine—Additives

Mobi Oil Corporation, 3225 Gafwos Road, Fairfax, VA 22037-0001

Shell Oil, P.O. Box 2463, Houston, TX 77252

Texaco International, 2000 Westchester Ave., White Plains, NY 10650

OL/WATER SEPARATORS

Afo Laval Separation, to 955 Meams Rd, Wainster, PA 18974-0556

Centri 00, Inc., (Westfaia Separation), 100 Fairway Court, Northvale, NJ 07647

Fast Systems, 3240 North Broadway, St. Louis, MO 63147

MMC International, 6010 Dr. Inwood, NY 11696

National Fluid Separators, 827 Hailey Industrial St., St. Louis, MO 63144

Nelson Industries, Hwy 51 West St., Orono, ME 04469

PAINT—COATING—CORROSION CONTROL

Amdean Qaafgr Removal, 12920 S.W. 99th Ave, Miami, FL 33176

Ameron, 201 N. Berry St., Brea, CA 92622

The Amessen Corp., Corrosion Dynamics Division, 1100 Walnut Street, Rosell, NJ 07203

Enviro Coatings, Inc., 4560 Belford Rd., Suite 300, Dallas, TX 75244

Esgaid, Inc., P.O. Drawer 2696, Lafayette, LA 70502

Global Tech, 9801 Westheimer St., Ste. 202, Houston, TX 77042

Jamestown Distributors, 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02635

Hempel Coatings, Foot of Curie Avenue, Wallington, NJ 07057

Melvin Pierce Marine Coating, Inc., P.O. Box 93, Semmes, AL 36575

Microphor, Inc., Marine Division, 452 E. Hill Rd., P.O. Box 1460, Willits, CA 95490

Nalco Marine Chemicals, P.O. Box 11, Northwich, Cheshire, CWB 40X, ENJUK

Sigma Coatings, 8979 Maiket St., Houston, TX 77029, 330 Rovef Road, Haivey, LA 70059, 1100 Adams St., Hoboken, NJ 07030

Untor Sh Service, Unit for Marine Chemicals Division, 3H Cfi St,

PIPE FITTINGS/CONNECTING SYSTEMS

Aeroquip Corporation, 3000 Strayer, P.O. Box 631, Maumee, OH 43537-0631

Deutsch Metal Components, 14800 S. Figueroa, Gardena, CA 90248

Lokring, 396 Hatch Drive, Foster City, CA 94044

Stanley G. Flagg Co., 1 Q20 W. H.K. Rd., Stowe, PA 19464

Thaxton, Inc., 25 Leoburg Rd., Mail 5, PA 16406 8401

PORT SERVICES

Port of Portland, 5555 N. Charnel Ave., Portland, OR 97217

PROPULSION EQUIPMENT—Bow Thrusters, Diesel Engines, Gears, Propellers, Shafts, Tufces

Avorlatelxjustlies, Haivey Quick Repair, P.O. Box 116, Haivey, LA 70058

American Air Filter, P.O. Box 35690, Louisville, KY 40432

ASEA Brown Boveri, 1460 Livingston Avenue, N. Brunswick, NJ 08902

ASEA Brown Boveri (Stromberg), P.O. Box 185, 00381 Helsinki, FINLAND

Argo International, 140 Franklin Street, New York, NY 10013

Aquamaster-Rauma Ltd., Box 220, SF-26101, Rauma, FINLAND

Bergen Diesel A/S, P.O. Box 924, N-5002, Bergen, NORWAY

Bird Johnson Company, 110 Norfolk St., Walpole, MA 02081

CWF Hamilton & Co., Ltd., P.O. Box 709, Christchurch, NEW ZEALAND

Caterpillar, 100 NE Adams Street, Peoria, IL 61629-2320

Coltec Industries (Fairbanks Morse Engine Div.), 701 Lawton Avenue, Beloit, WI 53511

Qirmwis Engre Company, Mail Code 60011, Box 3005, Columbus, IN 47202-3005

Bectro-Mr, civ. General Motors, 9301 W 55th St, UGrange, IL 60525

Rncanteri, Diesel Engines Division—GMT, Bagnoidela Rosandra 334, Trieste, ITALY

GE Naval & Drive Turbine Systems, 166 Boulder Dr., Fitchburg MA 01420

Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

Krupp MaK, 7555 Danbro Crescent, Mississauga, Ontario, CANADA L5N 6P9

Mapeco Products Inc., P.O. Box 6, 725 Glen Cove Ave., Glen Head NY 11545

Marine Gears, Inc., P.O. Box 689, Greenville MS 38707

Marine Systems Inc., 2032 Atlantic Ave., Chesapeake VA 23324

Markisches Werk, P.O. Box 1442, D-5884 Halver GERMANY

MAN B&W Diesel, 17 State St., New York, NY 10004

MAN B&W Diesel A/S, Ostervej 2, DK-4960 Holeby, DENMARK

MAN B&W Diesel A/S, Alpha Diesel, Niels Juels Vej 15, DK-9900 Frederikshavn DENMARK

MAN B&W Diesel GmbH, Stadtbachstrasse 1, D-8900 Augsburg 1 GERMANY

MKW Power Systems, 301 S. Church St., Rocky Mount, NC 27801

New Sulzer Diesel, Ltd., CH-8401, Winterthur, SWITZERLAND

Nylands Marine Service, P.O. Box 130, N4818 Faevik, NORWAY

Ornithruster Inc., 9515 Sorensen Ave., P.O. Box 2144, Santa Fe Springs, CA 90670

Ovako Steel Couplings AB Sweden, S-813 00 Hofors SWEDEN

Rolla SP Propellers SA, Via Silva 5, P.O. Box 251, 6828 Balerna SWITZERLAND

Rolla SP Propellers USA, 4030 Mustang Road, Melbourne, FL 32934, USA

Karl Senner Inc., 25 W Third, Kenner LA 70062

Schottel-Werft, D-5401 Spay, GERMANY

Siemens Energy & Automation, Inc., Systems Div., Marine Systems no. America

(A23N), 100 Technology Dr., Alpharetta, GA 30020

Stewart & Stevenson, 1400 Destrehan, P.O. Box 8, Harvey LA 70059-0008

Textron Lycoming, 550 Main St., Stratford, CT 06497

Thrustmaster of Texas, 12227-K FM 529, Houston, TX 77041

Ulstein International, A/S, N-6065 Ulsteinvik, NORWAY

J. M. Voith GmbH, Marine Division, Postfach 1940, D-7920, Heidenheim/Brenz, GERMANY U.S. Rep: Voith Schneider America Inc., 121 Susquehanna Ave., Great Neck, NY 11021

Oy Wartsila Ab, Vasa and Abo Divisions, P.O. Box 244, SF65100 Vasa, FINLAND

WesTech Gear Co., 2600 E. Imperial Hwy., Lynwood, CA 90262

WesSnghouse Marine Div, 401 E. Hendy Ave., Sunnyvale, CA 94088

ZF of North America, Marine Sales, 500 Bartley Blvd., Upland, CA 91786

PROTECTIVE WRAPS

FANA (Film Applicators of North America), 1260 E. Woodland Ave., Springfield PA 19064

PUMP—Repair—Drives

Beckson Marine, 165 Holland Ave., Bridgeport, CT 06605

Coffin Turbo Pump, Inc., 326 S. Dean Street, Englewood, NJ 07631

Del Gavio, 619 Industrial Rd., Carlstadt, NJ 07072

Golden Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231

Jim's Pump Repair, 48-5636th St., Long Island City, NY 101

Leitritz Corporation, 165 Chestnut Street, Allendale, NJ 07401

Vita Motivator, 99 W Hawthorne Ave., Suite 622, Valley Stream NY 11580

Wilden Pump & Engineering Co., 22069 Van Buren St., P.O. Box 845, Colton, CA 92324

REFRIGERATION EQUIPMENT/SERVICES

Unitor Ships Service, Inc., 2375 W. Esler St., Long Beach, CA 90813

REMOVAL/VEOPERATORS

Ebott Manufacturing, P.O. Box 773, Binghamton, NY 13902

S. S. White Technologies, Inc., 151 Old New Brunswick Road, Piscataway, NJ 08854

Telelex, Inc., 771 First Ave., King of Prussia, PA 19406

ROPE—Manila—Nylon—Hawsers—Fibers

Allied Signal Inc, Rbers Division, 1411 Broadway, New York, NY 10018

American Manufacturing Co., 200 S. Park Road, P.O. Box 52125, Lafayette, LA 70505

Dupont, Montgomery 403, 1011 Centre Road, Wilmington, DE 19805

SANITATION DEVICE—Pollution Control

Jered Blovm Brothers, 56 South Squirrel Rd., Auburn Hills, MI 48326

Byrne, Rice & Turner, Inc., 1172 Camp Street, New Orleans, LA 70130

Envirovac Inc., 1260 Turrel Dr., Rockford, IL 61111

Fast Systems, 3240 North Broadway, St. Louis, MO 63147

Microphor, Inc., 452 E. Hill Rd., P.O. Box 1460, Willits, CA 95490

Novatech, 820 Comorant St., Victoria, BC V8W 1R1, CANADA

Red Fox Environmental Services, Inc., P.O. Box 53809, Lafayette, LA 70505-3809

Reseaidi Productsean kenst, (Irx), 2639 Andion, Dallas, TX 75220

SCALE MODEHS

Sturgeon Bay Model Shop, 187 N. Ninth Ave., Sturgeon Bay, WI 54235

SCUTTLES MANHOLES

L.S. Baier & Assoc., 7527 NE 33rd Dr., Portland, OR 97211

SHIPBUILDING EQUIPMENT

NEI Syncrolift, Inc., 8970 S W 87th Ct., Miami FL 33176

SHIPBUILDING—Repairs, Maintenance, Drydocking

Asi Heros Espanotes SA, Pa Sa 17, 28006 Madrid, SPAIN

Atlantic Marine, Inc., P.O. Box 3202, Mobile, AL 36652

Atlantic Marine, Inc., 85(X) Heckscher Dr., Jacksonville, FL 32226

Avondale Industries Inc., P.O. Box 50280, New Orleans LA 70150

Bender Shipbuilding & Repair, P.O. Box 42, Mobile AL 36601

Bender Inc., 400 Goidon Drive, Bldg. 501, Exton, PA 19341

Beth Ship Sparrows Port Yard, Sparrow 5 Point, MD 21219

Bisso Marine Co., P.O. Box 4113, New Orleans, LA 70178

Bounger L. O. C. D. & Larose, P.O. Box 250, J. C. Port, LA 70374-250

Boug Divdock, P.O. Box 1852, Houma, LA 70361

Chr & Marine AB, P.O. Box 9025, S200039, Malmo, SWEDEN

Conrad Industries, 1501 Front Street P. O. Box 790, Moigan City, LA 70381

Oiacao Diydock, P.O. Box X12, Qiracao, Nelheilaxls Anaes Eastern, 505 North Sam Houston Pkwy, East Ste. 150A, Houston, TX 77060

Rncanteri SpA Cantieri Navali Italiani, Via Qpro 11, 16129 Genoa ITALY

Galveston Shipbuilding, 6800 Port Industrial Boulevard, P.O. Box 2660, Galveston, TX 77553

Gulf Craft, Inc., 3904 Highway 182, Patterson, LA 70392

Halter International, 7412 Lakeshore Drive, New Orleans, LA 70124

Htech Zbsen, Htech Shipbuilding & Engineering Co., 1-1-1 Hitokubashi, Cityoda Tokyo 100, JAPAN

Institute for International Research, 437 Mad Bon Ave., N.Y., N.Y. 10022

Jacteonvie, Shipyards 750 E. Bay St., Ja3-sonvie, FL 32202

Jeffboat Inc., P.O. Box 610, Jeffersonville, IN 47130

Kaermer Telsranct, N56320 Masland, NORWAY

Kvichak Marine, 615 N 34th St, Seattle, WA 98103

Lisnae, Apaiado 2138 1103 Lisbon, Codex PCIRTI GAL

MIL Davie, Inc., P.O. Box SO, Lewis, Quebec, CANADA

Marco, Inc., 2300 W Commodore Way, Seattle, WA 98199

Munson Manufacturing, 150 Dayton, Einonds WA 98020

National Maintenance & Repair Inc., P.O. Box 38, Hartloir, IL 62048

Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607

New York Shipyard Corp., One Bead St., Brooklyn NY 11231

Nichols Broheis Boat Builders, 54(X) South (Merion Road, Norconsull Enproiering Co., Inc., P.O. Box 529, 5785 Plantation Rd., Theodore, AL 36682

Protecno, Lii, Rua Eugenio C'siro, 13A-fe28 CIOAhi PORTIA

Thoesen, Inc., 790 Weno Rd., P.O. Box 755, Mahwah, NJ 07430 755

Thomas Mairé, 37 Bransford Street, Patchogue, NY 11772

SeaArk, P.O. Box 210, Monticello AR 71655

SeaFab, P.O. Box 1651, 4111 Cedar St., Pascagoula, MS 39567

Service Marine Industries, P.O. Box 3606, Morgan City LA 70381

Skipperfiner Shipyard, 621 Paris-Raza Dr., Dept 21, LaCrosse WI 54601

Southern Marine, Foolof Sampson St San Diego, CA 92113 3038

Steiner Shipyard, Inc., P.O. Box 742, Bayou laBatre, AL 36509

Swath Ocean, 979 G Street, Chula Vista, CA 92011

Textron Marine Systems, 66 CIO Raza Drive, New Orleans, LA 70127-2584

Trinity Marine Group, Box 3029, Gulfport, MS 39505-3029

Viking Maritec, 300 Montour Place, Ste 211, Oakdale, PA 15071

Zidel Marine Coip, 3121 SW Moody Street, Portland, OR 97201

Zbd of North America, Lt, Txripson Ceek Rd, P.O. Box 410, Stevensville, MD 21666

SIMULATOR TRAINING

Houston Marine Training Services, 160020th Street, Kenner, LA 70062

Marine Safety International, Marine Air Terminal, La Guardia Airport, NY 11371

SILENCERS

Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130

STABILIZERS

Naiad Stabilizers, Van Dusen & Meyer Inc., P.O. Box 558, Shelton, CT 06484

FOR MORE INFORMATION ON EQUIPMENT AND SERVICES ADVERTISED IN THIS ISSUE

CIRCLE THE APPROPRIATE NUMBER ON READER SERVICE CARD OPPOSITE

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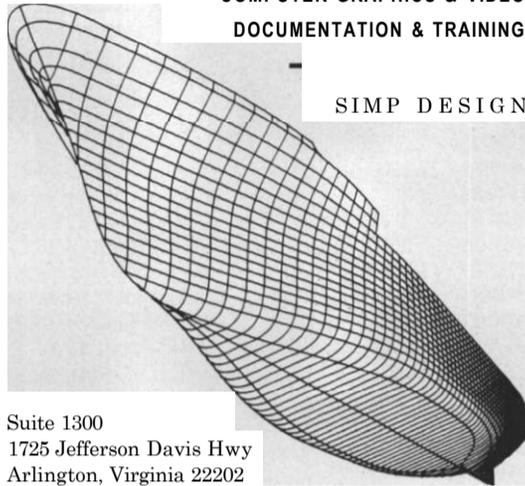
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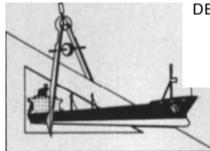
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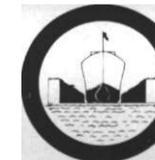
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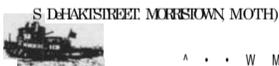


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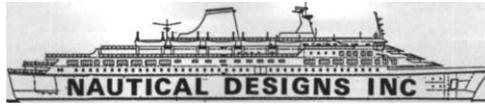
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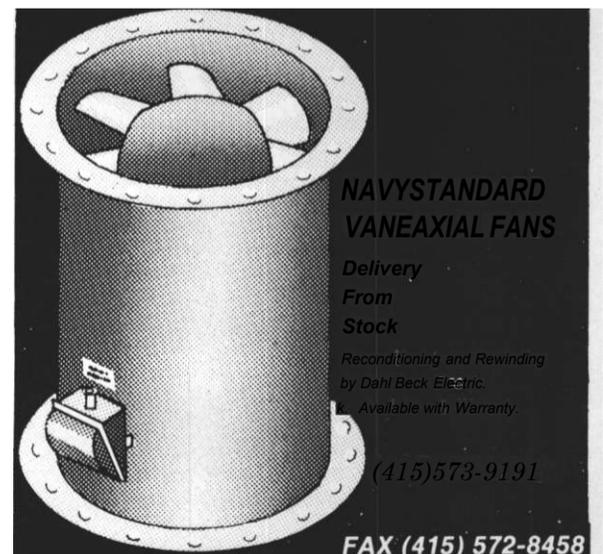


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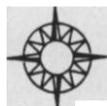
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Notice is hereby given that sealed bids will be received by The City of Alameda, City Clerk, at its mailing address, 2263 Santa Clara Avenue, Alameda California 94501, or by delivery to its office in Room 315 at the above address until 2:00 P.M. on Tuesday, August 18, 1992, at which time proposals will be publicly opened and read, for the procurement of a HIGH SPEED PASSENGER FERRY.

Specifications and bid documents for furnishing the vessel may be obtained by any prospective bidder on application to the Public Works Department, City Hall, Room 204, 2263 Santa Clara Avenue, Alameda California 94501. There is a \$20.00 non refundable fee for the package. Bids must be presented to the City Clerk under sealed cover and plainly marked on the outside, "Bid for Alameda/Oakland Ferry Vessel, P.W.# 12-91-14"

A bidder's conference will be held in the City of Alameda Council Chambers beginning at 9: a.m. on Monday, July 20, 1992.

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Maritime Reporter/Engineering News

W.A. Equipment To Market Winel Marine Product Line, Valve Autocad Routine

W.A. Offshore Equipment Company, of Kenner, La., was recently appointed by Winel b.v., Assen, The Netherlands, as its U.S. agent and distributor for Winel tank vent check valves, SOLAS 2 and 3 watertight sliding doors, shell-doors, ventilation cowls, and hatches to the marine industry.

Also being marketed by W.A. Equipment Company is a proprietary Auto Lisp routine for marine piping designers using AUTOCAD in drafting tank venting systems.

The program details and inserts the valves at the proper plan, section and front views. It will also add flanges, companion flanges and couplings. The system lets the designer automatically draw and measure the proper transition pipe from the deck penetration to the valve, allowing for the prefabrication of the transition piece. This will eliminate the need for hotwork after the valve has been installed and the tank already tested and approved.

Another feature of the design routine is that it requires very little memory space and will not interfere with memory resident programs. AUTOCAD drawings are available for most of the Winel product line and the routine easily converts from metric to U.S. standards.

For free literature from W.A. Equipment about the Winel marine product line and its new Auto Lisp routine,

Circle 4 on Reader Service Card

Kure Introduces New Mist Sprinkler Fire Protection System

Kure Shipping AB, Goteborg, Sweden, has recently released its Ultra-Fog mist sprinkler fire protection system into the marine safety equipment market.

The Kure design is a true mist sprinkler system using proven high-pressure technology for all its primary components. The special six-spray mist nozzles have no moving parts and the entire system is operated by standard motor-driven valves. Stainless steel construction combined with filters built into each nozzle head also limit corrosion.

Ultra-Fog atomizes water into extremely small droplets and requires only 3-liters of water per minute to extinguish a blaze in an ordinary size room. This makes the system ideal for shipboard use as it results in minimal water damage.

A Pump-Control unit monitors system water tightness, and its electrical and water supply. A Sprinkler processor allows the Ultra-Fog system to be programmed for specific functions such as: extending the extinguishing area if fire has not been extinguished within a set time; activating sprinklers in rooms adjoining the fire; and establishing varying readiness levels.

To receive free information from Kure Shipping on its Ultra-Fog mist sprinkler fire fighting system,

Circle 61 on Reader Service Card

Phoenix Introduces Explosion Proof Floodlight

The new SLXP series of high pressure sodium, portable floodlight being marketed by Phoenix Products Company, Milwaukee, Wis., offers

four times as much light as incandescent models of the same wattage. Rugged in construction, it's engineered to be water tight with a direct beam for more intensity.

Phoenix designed the SLXP for maintenance or emergency lighting in areas where flammable gases or vapors or combustible dust may be present in sufficient quantity to produce explosive mixtures. Areas of application include: paint, chemical and storage areas; petroleum refin-

ing facilities; pipeline pumping stations; grain storage facilities; aircraft maintenance and fueling areas; petroleum and chemical product marine transfer facilities; and aboard tank ships and barges themselves. The SLXP lights are built to contain an explosion within the fixture itself.

To receive free literature about Phoenix's new SLXP sodium floodlights,

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- **SMM '92 • INTERNATIONAL SHIP MACHINERY and MARINE TECHNOLOGY EXPOSITION**
- **GERMAN MARITIME INDUSTRY REVIEW**
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- **MARINE POWER**
Propulsion and Power Systems, Components, Auxiliaries and Controls.

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Oct.

AD CLOSING
September 4

- **ANNUAL SNAME ISSUE (Society of Naval Architects & Marine Engineers)**
- **SNAME 11th Annual International Maritime Exposition**
The Most Important U.S. Marine Industry Show. The November Issue of **Maritime Reporter** will contain Full Details covering the entire Technical Program as well as the Exposition.
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