

MARITIME REPORTER AND ENGINEERING NEWS

FISH EXPO '93

Plus...

- Safety At Sea
- Debut of Minehunter Class



**UPDATE:
PHOENIX WORLD
CITY**

OCTOBER 1993

ISO 9002
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Drew launches new shipboard products.

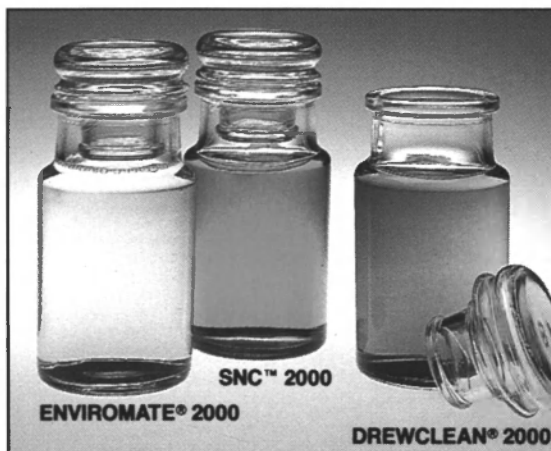


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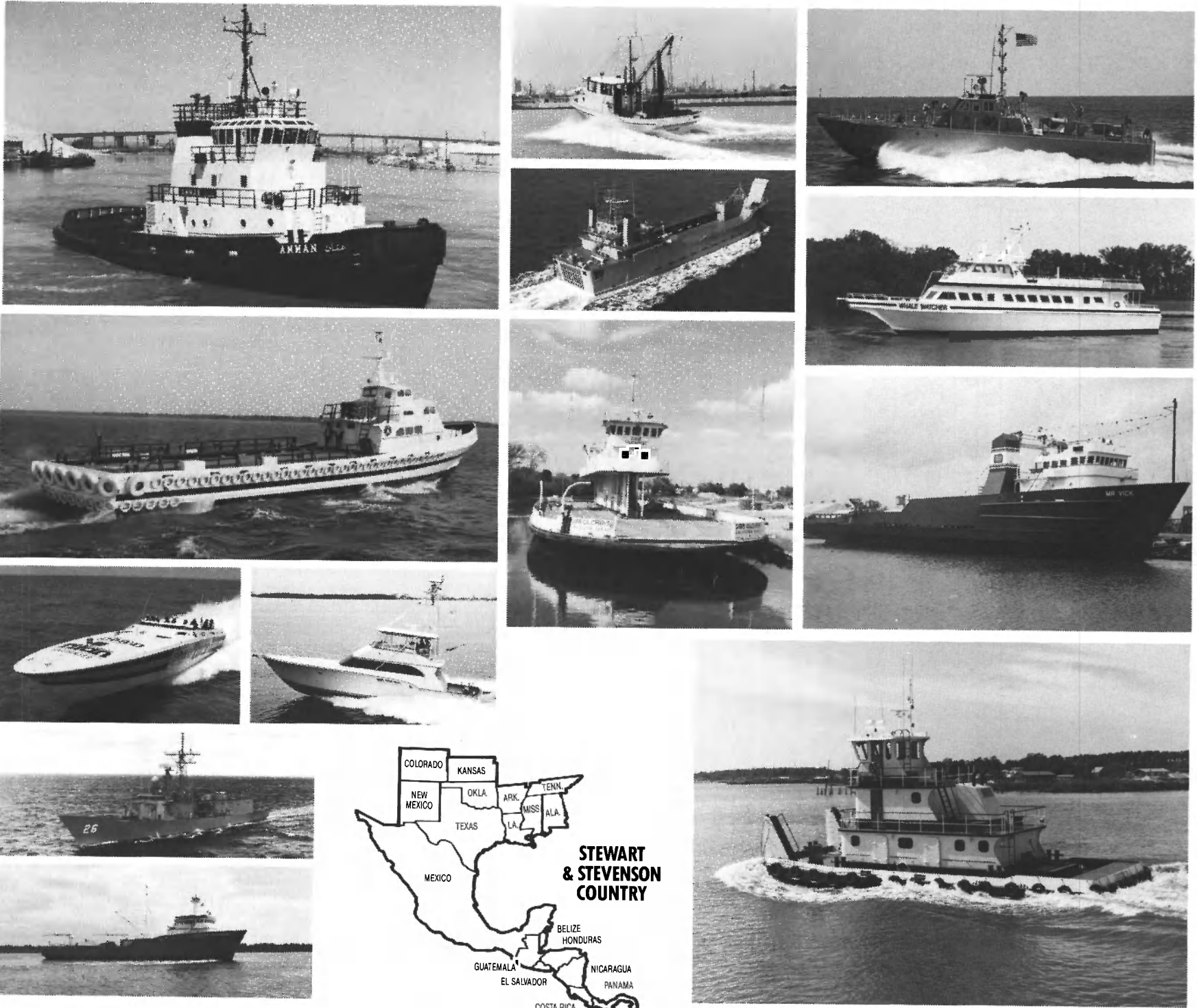
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ON THE COVER

Pictured on the cover is the Bold Adventress, built by J.M. Martinac Shipbuilding Corporation. The vessel, powered by MaK diesel engines and featuring Caterpillar generators, is 250 feet long and is owned by Edmund A. Gann, et al. Pictured in the inset box is the first of a new minehunter class for the U.S. Navy, built by Intermarine USA (see page 56).

INSIDE:

UPDATE:
Phoenix World City And The
"Virtual Shipyard" 22

Preview: Fish Expo '93 30

FEATURE: Safety At Sea:
Industry Leaders
Speak Out 37

Preview: Ship Repair &
Conversion '93 51

NEW TECHNOLOGY:
Intermarine USA Delivers First
Glass Reinforced Plastic
Minehunter To The USN 56

Preview: ASNE Technical
Symposium 65

Calendar 69

NASSCO Awarded \$1.3 Billion Contract

National Steel and Shipbuilding Co. (NASSCO) has received a \$265 million contract from the U.S. Navy to design and build a Strategic Sealift Ship. The contract contains options to build an additional five vessels. If all six vessels are built, the contract will grow to \$1.3 billion. The engineering and planning will begin immediately, and delivery of the lead ship is scheduled for the second quarter of 1997.

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An artist's rendition of the MK V SOC.

Peterson Wins \$4.5 Million Contract To Build MK V Special Operations Craft

Peterson Builders, Inc. (PBI) announced it has been awarded a \$4.5 million Cost Plus Fixed Fee (CPFF) contract by the U.S. Special Operations Command to construct the Mark V Special Operations Craft (MK V SOC) System, a craft/transporter package, for test and evaluation. PBI was selected as one of two

companies to provide these test craft. The initial solicitation drew an estimated two hundred interested companies from which nine timely proposals were received and evaluated. PBI's "Sea Stalker Class" patrol craft is an asymmetrical catamaran based upon the Cougar Cat 2100 "Dark Moon Class" patrol craft developed by Cougar Marine, Ltd. of Hamble, England and delivered to the Spanish Customs Service, which is now in operation. The MK V SOC has a length of 71 feet, a beam of 18 feet, a draft of 4.6 feet and a top speed in excess of 50 knots. PBI's MK V SOC will be built to Det Norske Veritas (DNV) Classification Society Rules.

Included in the MK V SOC System is a craft transporter designed for both over the road applications and airborne transport in a C5 A/B aircraft. PBI has chosen Talbert Manufacturing, Inc. of Rensselaer, Ind. as its partner to supply this unique piece of equipment. Talbert was selected because of its experience in the design and manufacture of multiple axle, steerable devices for many special applications.

For more information on Peterson Builders,

Circle 25 on Reader Service Card

MK V SOC Equipment List

Main engines	MTU
Propellers	Rolla
Thrusters	Hamilton Waterjet
Generator engines	Fischer Panda
Thruster engines	MTU
Reduction gears	ZF
Engine controls	MTU
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Siemens Wins Washington State Ferries Contract

Siemens has been selected by Washington State Ferries as the primary contractor to supply the diesel electric propulsion system on three Jumbo Mark II-class ferries. The contract is worth approximately \$40 million.

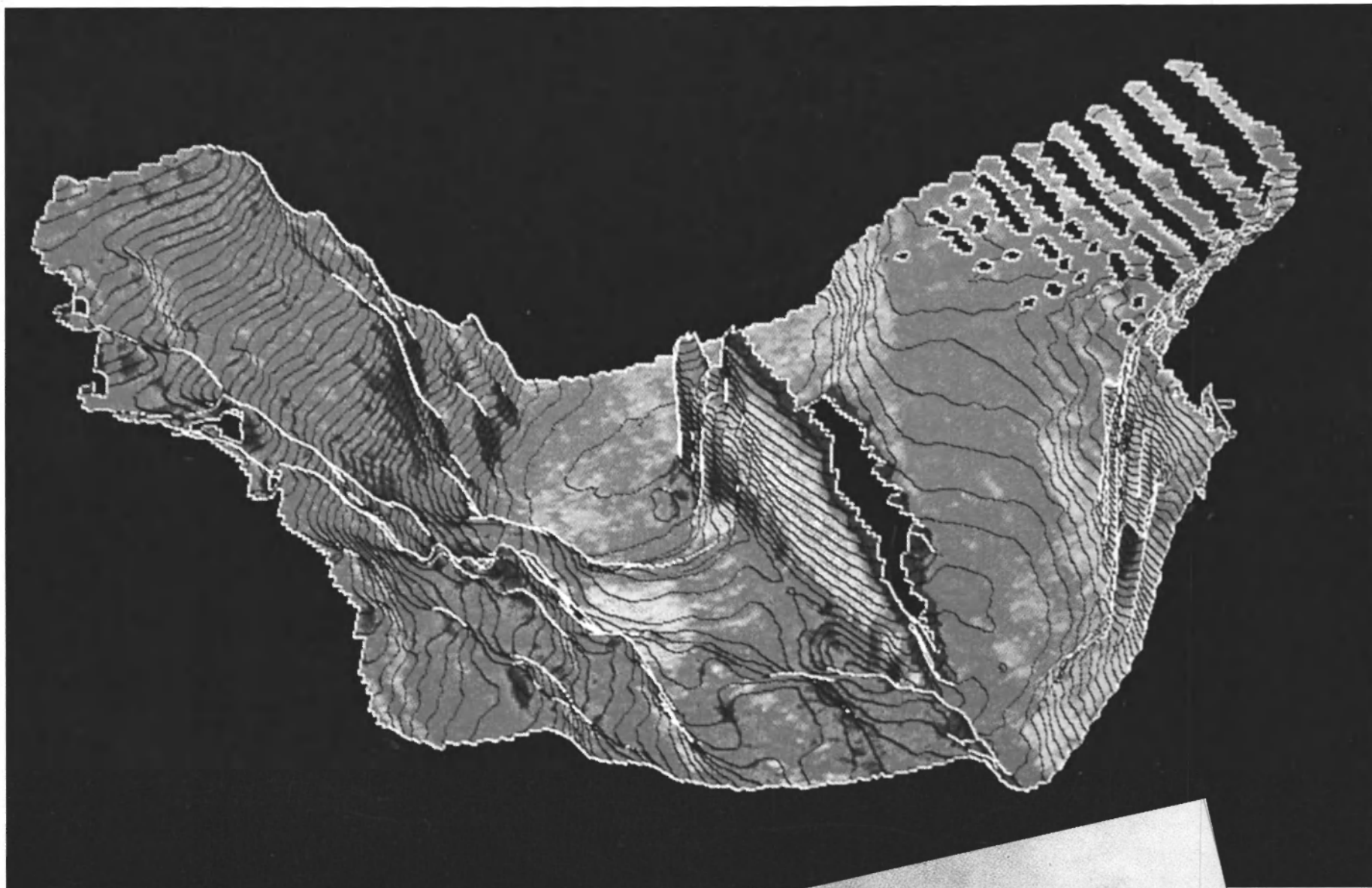
"Washington State went through an extensive and thorough evaluation process of state-of-the-art available technology, and decided on Siemens Cycloconverter Technology," said a Siemens spokesman.

As the single system vendor, Siemens is to supply the entire propulsion package. Siemens is scheduled to start delivery for the first vessel in December of 1994, and the contract period extends through 1999. Washington State Ferries has yet to select a builder for the vessels, and is currently accepting bids. For additional information on the capabilities of Siemens,

Circle 103 on Reader Service Card

Maritime Reporter/Engineering News

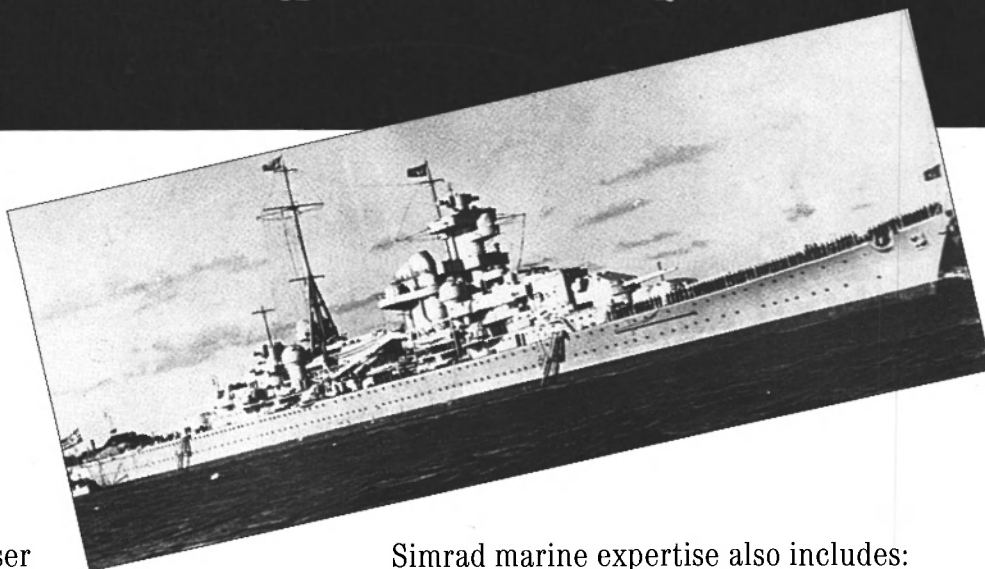
Soundtrack by Simrad



Sound made this seabed map of an area of the Oslo Fjord, Norway.

The wreck of the German heavy cruiser *Blücher*, lying keel upwards in 90 meters of water, is visible in the middle of the image. Contour lines show the depth whilst color codes register object hardness.

The image was produced by a Simrad EM 1000 Multibeam Echo Sounder passing just once over the area - an example of what to expect from Simrad instruments, based on more than 40 years experience in marine electronics.



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Raytheon Wins \$13 Million Contract For Antisubmarine Warfare System

The Naval Sea Systems Command's Unmanned Undersea Vehicle (UUV) Project Office (PMO-403) chose Raytheon Company to carry out the design phase of the MK 30 Mod 2 Antisubmarine Warfare Training Target System (ATS). The contract is worth approximately

\$13 million. The MK 30 Mod 2 ATS, which will provide in-water training for submarine, surface ship and aircraft crews to employ their sensors and weapons, is a 21-inch diameter UUV that emulates the movements and acoustic/magnetic signatures of threat submarines. The Navy expects to follow the three-year prototype contract with development and production contracts for approximately 70 systems on existing three-dimensional underwater tracking ranges. The Naval Under-

sea Warfare Center in Newport, R.I. will provide technical direction.

For more information on Raytheon,

Circle 105 on Reader Service Card

New Harbor Tugs Delivered To Sembawang Maritime

Sembawang Maritime of Singapore took delivery of three

China-built harbor tugs, each of which costs an estimated \$9 million.

The three were built by Tianjin's Xinhe Shipyard, a subsidiary of China State Shipbuilding Corp. Sembawang now has 23 vessels, and is reportedly the largest private operator of harbor tugs in Singapore.

The tugs were ordered last year and are part of Sembawang Maritime's ongoing fleet renewal and expansion program for its harbor tugs and ocean-going tugs and barges.

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Circle 273 on Reader Service Card

Gulfport GRP Div. Of Avondale Christens Second Coastal Minehunter "Robin"

MHC 54, the second of four coastal minehunter ships being built for the U.S. Navy by the Glass Reinforced Plastic (GRP) Div. of Avondale Industries, Inc., was christened the Robin in ceremonies at the Gulfport shipyard on September 11.

It is the fourth ship in the Navy's MHC 51 (Osprey) Class Coastal Minehunter Program, and the third U.S. Navy ship to bear the name Robin.

The sponsor of the new ship was **Hope Puanani Kihune** of Pensacola, Fla., a native of Hawaii, as is her husband, Vice Admiral **Robert K. U. Kihune**, U.S.

Navy.

Avondale's GRP Division is located on a 122-acre facility on Bayou Bernard in Gulfport, with direct water access to the Gulf of Mexico.

The division is presently engaged in the construction of four coastal minehunters for the U.S. Navy. Avondale Industries, Inc. is headquartered in New Orleans, La., and is one of the leading marine fabricators in the nation, active in the construction, repair and conversion of oceangoing vessels. For more information on Avondale,

Circle 106 on Reader Service Card

Allegretti Named AWO President; Farrell To Retire On January 1, 1994

The American Waterways Operators (AWO) elected **Thomas A. Allegretti** president. Mr. Allegretti will succeed **Joseph Farrell** as president of the associa-

tion, which is the national association of the domestic inland and coastal barge and towing industry, on January 1, 1994.

An AWO staff member since 1985, Mr. Allegretti currently serves as senior vice president-operations. In this capacity, he is responsible for directing the development and promotion of federal policies beneficial to the U.S. barge

and towing industry. He also serves as a principal advisor to the AWO president on a wide range of public policy, membership and administrative issues.

"We are extremely pleased to have **Tom** assume the AWO presidency," said **Donald Duffy**, chairman of the AWO Board of Directors, at AWO's recent Fall Board Directors meeting in Washington, D.C. "His more than 19 years of experience in the industry, as well as his proven track record of leadership within the association, will carry on the standard of excellence AWO is associated with well into the future."

Mr. Farrell will retire January 1, 1994 after 11 years of service with the association.

Mr. Farrell is credited with turning AWO into a modern, highly-effective trade association, greatly increasing the AWO membership and leading a host of victories for the industry.

Sause Expands Hawaiian Trade Capacity By Half

Sause Bros. Ocean Towing Co. will expand its capacity on the West Coast-Hawaiian trade from Portland and other Northwest ports this fall by more than 50 percent through the addition of two barges and a tug.

Sause will launch the barge Hana, a 325,000-cubic-foot deck house and 10,000 tons of cargo capacity, in November from Somar, its affiliated shipyard in Coos Bay, Ore. The

Hana gives Sause an additional 100,000 tons of annual capacity, a more than 50 percent increase from the approximately 200,000 tons it has dedicated to the West Coast-Hawaiian trade for the past two years. In addition, the 80,000-cubic-foot deck cargo house and 4,000-ton capacity Skipanon was placed into service in late September by Sause.

A third addition to the Hawaiian trade is the 5,700-hp tug Gulf Ranger which, after an overhaul, will join her twin, the Natoma. Sause provides scheduled service between the Hawaiian Islands and the Port of Portland's Terminal 2 and the ports of Coos Bay and Longview, Wash. These vessel additions bring the Sause fleet to six barges and three tugs dedicated to the West Coast-Hawaiian trade.

Hitec Introduces AC Drilling At Shell Troll Facilities

Hitec is introducing AC design on the drilling facilities of Shell's Troll Gas Development Phase 1. AC Drilling reportedly gives better drilling performance through better control of drilling equipment. Other improved aspects of drilling include low cost, less maintenance and less electrical noise. Hitec's AC Drilling Control System was developed in association with Rogaland Research Center and Exxon, and in cooperation with ABB Industry Oy, Dresco-Energy and Varco BJ.



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SIRE: New Initiative To Reduce Oil Pollution

"The oil and marine transportation industries should not rest until operational safety is at a level where environmental pollution from tankers is essentially eliminated," said **Gerhard Kurz**, chairman of the Oil Companies International Marine Forum (OCIMF), at a recent press conference in London. He was announcing the latest in a series of

safety initiatives by OCIMF, its Ship Inspection Report (SIRE) program. This makes it possible for OCIMF members, which include most of the world's leading oil companies, as well as port authorities and other interested parties, to have information about the condition of oil tankers which previously was restricted primarily to those wishing to charter them. This is expected to encourage the owners of the tankers to devote greater efforts to tanker safety which, it is hoped, will lead to

a reduction in the incidence of pollution. Mr. **Kurz**, who is president of Mobil Shipping and Transportation Co., a Mobil Oil affiliated company, said "Operating standards can and should be improved beyond the levels which have already been achieved." It is anticipated that the start-up date for the SIRE program will be the second half of October. OCIMF, formed in 1970, currently has 34 members and is representative of virtually every important oil organization in the world.

Kvaerner Wins \$6 Million Order For Catamaran

Kvaerner A/S received an estimated \$6 million contract for a high-speed catamaran. To be built by Kvaerner's shipbuilding unit, Kvaerner Fjellstrand, for Norwegian ferry operator Finnmark Fylkesrederi og Ruteselskap ANS, the 40M Flying Cat is scheduled to be delivered next April.

APL Expands Service To Include Russian Far East

American President Lines (APL) has expanded its service area to include key coastal and interior points in the Russian Far East.

The weekly service, which was initiated to carry relief cargo to the former Soviet Far East, has been upgraded to a full commercial basis, linking eastern Russia with North America and the rest of Asia. Key products moving from Russia to points in Asia and North America include lumber and seafood.

Rockwell Wins \$17.7 Million Navy Contract

Rockwell Intl. Corp. was awarded a \$17.7 million contract for the initial production phase of the Navy's High Power Transmit Set, a communications element for strategic forces.

BSL Names Kaiser VP Of Equipment & Transportation

Blue Star Line (BSL) has named **David Kaiser** vice president of Equipment and Transportation.

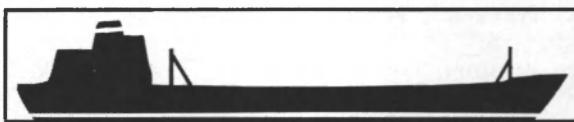
BSL operates a leading shipping service to Australia and New Zealand from the Atlantic, Gulf and Pacific coasts of North America.

Mr. **Kaiser** is based at the BSL headquarters in New York. The 16-year veteran in the traffic and transit industry brings a financial perspective to the equipment and transportation responsibilities he has with BSL.

For the past 12 years, he has been involved in budgeting, analyzing operational costs and forecasting operating and capital budgets.

SSE Launches Major Yard Upgrading Project

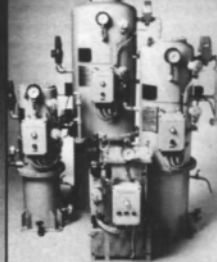
Singapore Shipbuilding & Engineering Ltd. (SSE) is embarking on major civil works in a \$30 million upgrading of its yard facilities. Plans are for the facility to have the capability to repair vessels up to 40,000 dwt, up from its 10,000-dwt capacity. There are also plans to build two berths at the site capable of building ships up to 30,000 dwt, more than doubling current capacity.



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Marine Sanitation Devices have no moving parts, no power requirements and low maintenance. Discharge by gravity or sump/pump. Accommodates crews from 3 to 100 men. IMO approved. USCG certified.

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Circle 241 on Reader Service Card

HEAVY DUTY POWER WINCHES

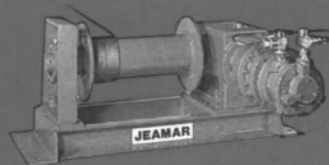


Electric Winches

- Direct drive
- Fully reversing
- Fail-safe braking is standard
- Numerous options — grooved drums, limit switches, free spooling, variable speed, & more
- 13 Models from 400LB line pull to 32,000LB line pull

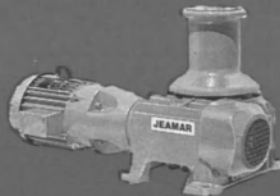
Air Winch

- Direct drive
- Fully reversing
- Fail-safe braking as standard
- Numerous options — grooved drums, limit switches, free spooling, & more
- 5 Sizes available 800LB line pull to 4,000LB line pull



Capstan Winches

- Direct drive
- High starting loads
- Rope can come off at any angle
- Non-reversing unless power driven
- 8 Models available from 2,000LB starting line pull to 20,000LB starting line-pull



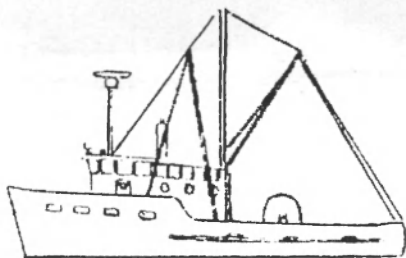
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A. Fai Delivers 11th High-Speed Catamaran

Dubbed Jin Xing, a 92-foot aluminum high-speed ferry was recently completed by A. Fai Engineers and Shiprepairers for the Shen Zhen Shipping Company of Guangdong Province in the Peoples Republic of China. The Jin Xing, which was designed by Advanced Multi-Hull Designs, is the 11th high-speed catamaran built by A. Fai of Hong Kong. It will be followed by the delivery of another vessel designed by Advanced Multi-Hull Designs, a 79-foot version, by the end of the year.

The Jin Xing is made of marine grade aluminum, and built to DnV High Speed and Light Craft rules, classed by the Chinese Classification Society. The 28-dwt vessel is powered by a pair of Deutz MWM TBD diesels, and is capable of carrying 242 passengers.

For more information on the design expertise of Advanced Multi-Hull Designs,

Circle 109 on Reader Service Card

ABB Turbochargers Appoints New Head Of After Sales Service

Dino Capanni took over as general manager of after sales service from **Peter Neth**, effective October 1, 1993.

Mr. **Neth** was promoted to vice president, and will assume the responsibilities of the R&D and production departments at ABB CMC Carl Maier & Co. Ltd. in Switzerland. He was a member of the ABB (previously BBC) Turbocharger team for 16 years.

Mr. **Capanni**, the new head of ABB Turbochargers service and spare parts activities, which includes 80 service stations worldwide, has been with ABB Turbochargers since 1972.

Thordon Bearings Earns ISO 9000 Certification

Thordon Bearings, Inc., a member of the Thomson-Gordon Group, is now a part of North America's exclusive corporate group of those holding ISO 9000 international quality assurance certification. Developed by the International Standards of Organization, the ISO 9000 series provide comprehensive quality assurance procedures.

Utilizing a unique self-lubricating elastomeric polymer, Thordon bearings reportedly offer exceptional wear life.

Thordon bearings are supplied in various configurations and used by navies, commercial vessels, hydroelectric power producers and industrial plants in over 50 countries.

For a free brochure on Thordon Bearings, Inc.,

Circle 107 on Reader Service Card

Thai Navy Orders Atlas Elektronik Simulator

Atlas Elektronik was awarded a contract by the Royal Thai Navy for the supply of a modular-designed ship-handling simulator.

Due for installation at the Royal Thai Naval Academy in Bangkok in August of 1994, the unit will be used for, among other things, the training of personnel in ship maneuvering and navigation operations, as

well as general team training exercises.

Computer-generated imagery will be provided by Atlas Elektronik's latest DISI 4N system for real-time simulation of visual ship and ship-handling scenarios on a 240-degree panoramic screen via a series of overhead color video projectors.

For more free information on the full spectrum of Atlas Elektronik products,

Circle 110 on Reader Service Card

BP Launches Computerized Marine Atlas For Windows

BP Shipping launched a new computerized Marine Atlas for Windows, making the task of finding ports anywhere in the world reportedly easier and faster than the book method. The atlas contains more than 7,000 ports and prominent geographical features such as capes,

(Continued on page 12)

Marine Travelift Big Capacity Mobile Shiplifts Offer Ship Yards More Service Opportunities

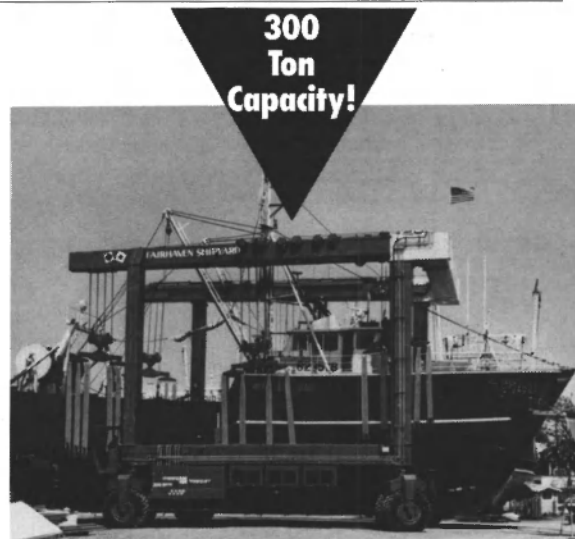
Expand your boat service opportunities with Marine Travelift's new 500 ton capacity or the 250 ton capacity mobile shiplifts...and capture a larger share of profits.

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Model 300BFM lifts a 270 ton boat at Fairhaven Shipyard, Fairhaven, MA.



250 AMO with 108 YP Navy Training Vessel at U.S. Navy Small Craft Repair Facility, Annapolis, Maryland.

For more information and complete specifications on our large capacity lifts or our complete line of mobile boat hoists with capacities from 15 to 500 tons, contact your local representative or Marine Travelift, Inc., 49 E. Yew St., P.O. Box 66, Sturgeon Bay, WI 54235 • 414-743-6202 • Telex: LIFTS STGB 260056 • Fax: 414-743-1522.

500
Ton
Capacity!

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MARINE  TRAVELIFT, INC.

(Continued from page 11)

straits and headlands. Hard copy prints can be produced if required. The program's database is reportedly easy and cost effective to update. For free information,

Circle 108 on Reader Service Card

Marathon Marine Delivers Hatfield-Designed Vessels

Marathon Marine Manufacturing Ltd. of Edmonton, Alberta delivered

two aeration lagoon service vessels to Weyerhaeuser Canada Ltd. pulp mills. The all-welded aluminum, 36.5-foot vessels were designed by Peter S. Hatfield Ltd. The vessels are designed and accordingly outfitted to accomplish a variety of tasks, including the laying and servicing of cables on the lagoon floor, sampling of the effluent water quality and the positioning of flow control barriers.

Each vessel is powered by a 235-hp, 2,900-rpm continuous rated Star Power 444 marine diesel, keel cooled,

with ZF MPM IRM direct ratio reverse gear driving a Kodiak waterjet.

For more information on Peter S. Hatfield, Ltd.,

Circle 111 on Reader Service Card

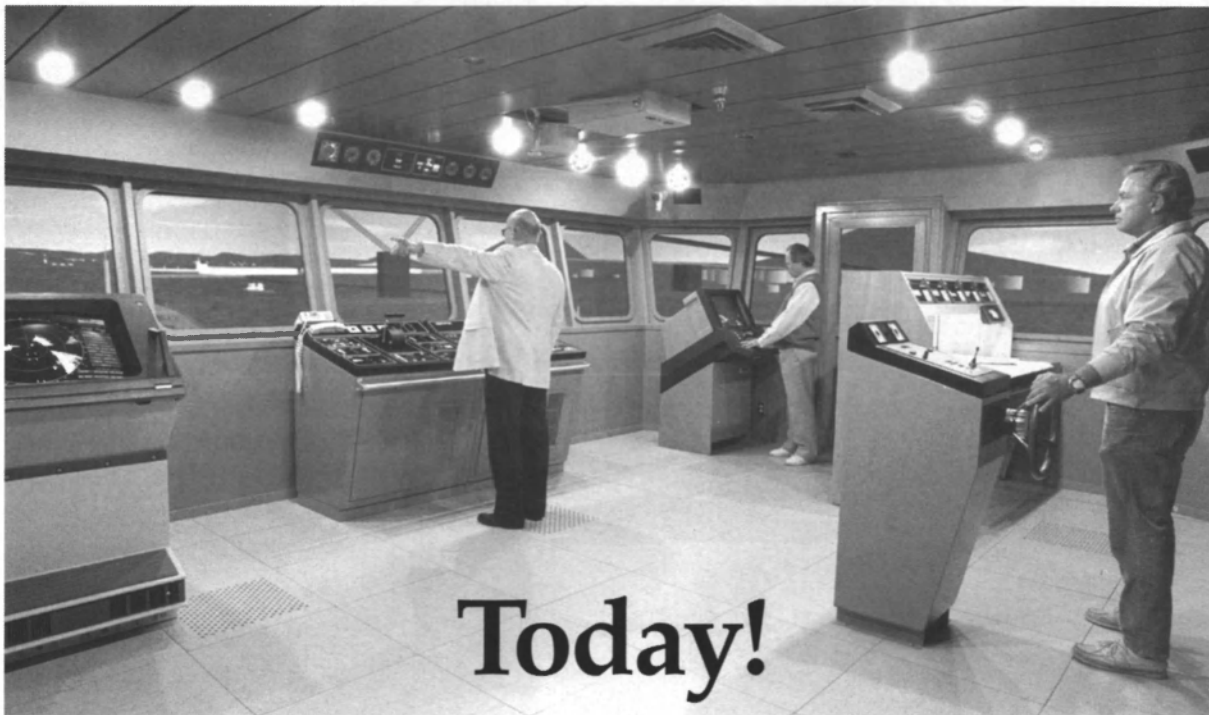
Balehi Marine Completes Dredge Hull

Balehi Marine, Inc. completed the fabrication of a dredge hull for

Ellicott Machine Corp., Intl. The dredge hull is to be outfitted by Ellicott Machine in Maryland before transportation to Paraguay. This is the first dredge hull completed for a new series of Ellicott Dredges. Balehi Marine is a shipyard, founded in 1975, which specializes in the construction and repair of marine vessels and barges. For additional information on the services of Balehi,

Circle 112 on Reader Service Card

Maritime Training in the 21st Century.



The bridge of STAR Center's 360° full-view training simulator.

Commercial and military maritime personnel are upgrading their skills at STAR Center, home of the world's first 360° full-view training simulator. This 21st century technology gives students a "full mission" experience piloting ships, tankers, barges and work boats through inland waterways, ports and on the oceans.

With the aid of STAR Center's high performance visual simulator, students encounter the expected and unexpected in ship handling, docking, navigation, engine operations and cargo transfer. It's the kind of practice that improves crew competence, reduces the possibility of human error

and saves money for ship owners, operators and insurers.

Students navigate their vessel through a Port of Valdez snow storm, encounter torrential rains while docking in Miami and respond to a shipboard emergency -- all without leaving the classroom. Following each exercise, instructors meet with their students to analyze video playbacks of each simulation.

To learn more about training on 21st century technology, call or write Harry J. Crooks, Director, STAR Programs, for a facilities brochure and a listing of classes.

STAR Center

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Circle 27C on Reader Service Card

SeaArk Delivers Survey Vessel To Corps Of Engineers

The U.S. Army Corps of Engineers, St. Louis District, accepted delivery of a survey vessel built by SeaArk Marine. The new 42-foot aluminum boat is designed for use on the middle Mississippi River, playing a key role in the Corps' Bendway Weir Project, which involves submerging rock structures in river bends to control natural river bank erosion and channel narrowing.

Dubbed the J.H. Simpson, to honor the first official St. Louis district surveyor, Colonel **James H. Simpson**, who served from 1873 to 1880, the Dauntless class, all-welded aluminum vessel is powered by twin Detroit Diesels. Electrical power is from an Onan generator, and both propulsion engines and generator utilize Fernstrom closed cooling systems. For more information on the capabilities of SeaArk,

Circle 113 on Reader Service Card

USCG Chemical Hazards Response Information System Available

The latest edition of the U.S. Coast Guard's (USCG) two-volume Chemical Hazards Response Information System (CHRIS) on hazardous chemicals is now available at the Government Printing Office (GPO).

"The system covers 1,250 of the most dangerous chemicals being shipped across the country today," said Dr. **Alan L. Schneider** of the USCG Marine Technical and Hazardous Materials Div.

Volume 2 of CHRIS contains 2,800 pages and is intended for office use. The pages are designed to fit standard loose leaf binders so that supplements on new chemicals may be added.

CHRIS also includes a six-by-nine-inch condensed version, Volume 1, intended for field use.

To order CHRIS or to inquire about Volume 2's magnetic tape or floppy disk, call (202) 783-3238, or write to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Cite order number 050-012-00328-9 for Volume 1 or 050-012-00329-7 for Volume 2.

“Engineer a better fiber,
and ultimately you’ve engineered
a better product.”



As marine applications became more demanding, the rope industry faced a new challenge -- to engineer a better performing polyester rope product.

Through a program of intense fiber research, AlliedSignal engineers discovered the solution. By applying a unique and proprietary SeaGard® finish to the ACE polyester fibers, a better performing wet abrasion resistant rope was now able to be constructed.

In independent testing and in field testing by several rope manufacturers, ACE Polyester SeaGard ropes -- 3-strand and braided -- outlasted and out-performed ordinary polyester ropes by incredible margins, even under the most severe wet abrasion conditions.

Today, rope manufacturers have found that they require a higher level of performance plus cost-effectiveness for the most demanding applications, such as: tethers for balloons, underwater surveillance systems, offshore oil rigging and transmission and distribution (T&D) lines. ACE Polyester SeaGard meets these requirements. And, for the sailor who wants the best in performance, SeaGard ropes offer that certain added security plus easy, smooth handling.

For further information and test results, contact:
Dept. A-S, Suite 1500, 224 West 35th St., NY, NY 10001.

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FIBERS

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"Wild Thing" high speed passenger ferry operating in Virginia Beach.

American-Designed Fast Passenger Craft, "Wild Thing," Reaches 45 Knots

An all new, American-designed high speed passenger vessel, named "Wild Thing," has gone into operation in Virginia Beach, Va., carrying tourists on a one hour thrill ride at sea.

Wild Thing is of a new trademarked design known as F.A.S.T.-1 (fast air supported trimaran). The

F.A.S.T.-1 is a new design that fits the need for a low-technology, high performance vessel.

Three elements make up the F.A.S.T.-1 design: three long hulls with a flat bottom and five degree trim angle for lift; two tunnels with a decreasing volume from bow to stern for lift and air suspension; and a large flat deck that can be used for carrying anything from people to freight.

The 97-foot Wild Thing, has a 3 foot beam and a four-foot draft. Wild Thing is reportedly the fastest 15 passenger U.S. Coast Guard certified subchapter T-L vessel (approved for 150 passengers at 45 knots).

The vessel was built at Todd Marine in Norfolk, Va. for approximately \$2 million.

The Wild Thing's unique design makes it useful for multiple applications, including: offshore crew/work boat; oil rig support; personnel ferry; diving/salvage/fire/rescue; drug interdiction; and unlimited configurations for military requirements.

In designer Joshua W. Johnson's opinion, there are very few American-designed high speed passenger ferries in operation in the U.S. because of the assumed risk involved with taking a chance with a new design.

"Everyone is copying everyone else," said Mr. Johnson. Mr. Johnson also cites the difficulty with securing the financing to provide the funds necessary for building these vessels.

According to Mr. Johnson, building and designing the vessel didn't take nearly as much time as finding a sponsor for the vessel. (Mr. Johnson said that he worked on the Wild Thing's design for more than four years, but once a customer approached him who was willing to contribute the funds needed to build the vessel, building commenced in 18 months.)

Mr. Johnson has also designed offshore racing power boats, sail boats, yachts and gun boats for foreign navies.

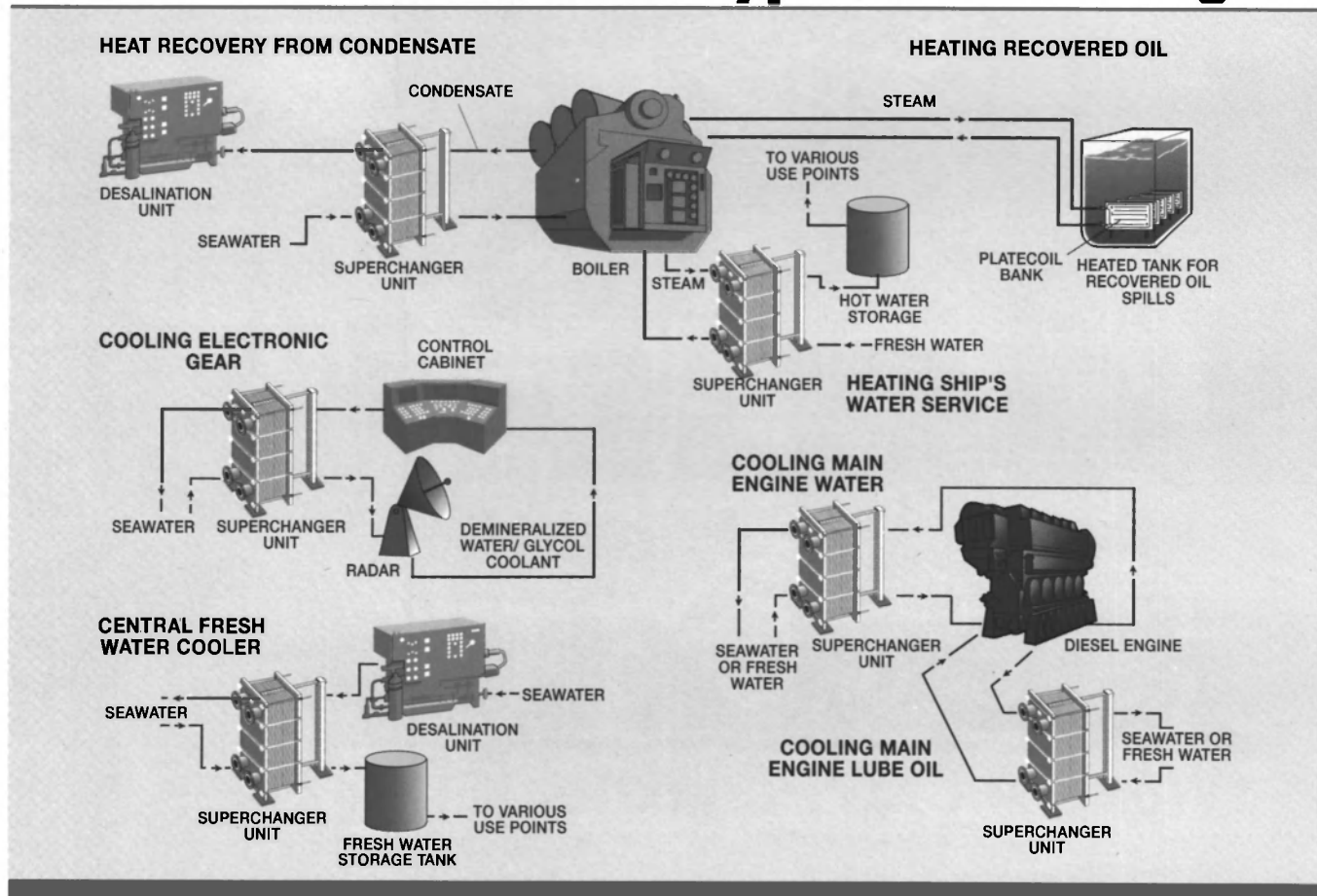
At press time, American Waterways is negotiating with Mr. Johnson for additional vessels to be used as excursion boats to the San Juan Islands.

They are reportedly looking at shipyards on the West Coast to build the additional vessels.

For more information,

Circle 39 on Reader Service Card

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.

Superchanger units can be equipped with titanium plates which offer the best resistance to corrosion and erosion when exposed to seawater. Intermixing or cross-contamination

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.

Platecoil® prime surface heat exchangers offer optimum temperature control. A Platecoil bank-in-tank unit provides wide interspaces for effectively passing solids while efficiently heating seawater containing oil from spills.

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.

With over 50 years of heat transfer problem solving experience, Tranter is uniquely poised to answer your tough questions and solve your precise needs. Call us at (817) 723-7125. Better still, ask your local Tranter representative about our Heat Transfer Symposia.



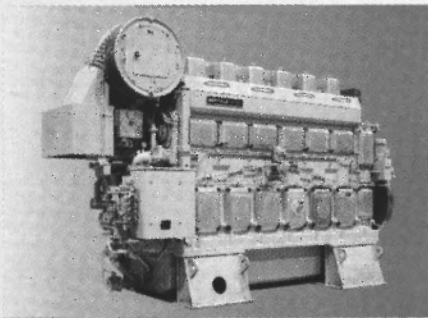
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Wild Thing Equipment List

Main engines	Caterpillar
Propellers	France Helix
Reduction gears	ZF
Engine controls	Jastram
Steering controls	Jastram
Shafting	Aquanet
Coatings	Devco
VHF radio	Standard Communication
Radar	Raytheon
Compass	Ritchie
Loran	Raytheon
Pumps	Par

Wärtsilä Diesel makes the difference in protecting our environment.



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**6000 hp
Tanker Escort Tug**



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M/V Kinsman Hawk
being built for
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d/b/a St. Philip Towing
by
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Newly designed escort tugs, containing highly efficient Wärtsilä Diesel engines, are helping reduce the risk of unwanted discharge of oil from large tankers as they enter and exit ports in environmentally sensitive areas. Additional benefits are derived from advanced diesel technology that achieves extremely low NOx emissions. For more information, contact (410) 573-2100.

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Alfa Laval Secures Breakthroughs In Far East Markets

Alfa Laval Desalt A/S has made breakthroughs in the highly competitive Far East newbuilding market by securing contracts for vessels building in Japan and Korea.

In Japan, COSCO's two 42,000-dwt containerships building at Kawasaki Heavy Industries will be

equipped with Alfa Laval distillers, a central cooling system and the latest version of the Engard computerized control system.

Alfa Laval's success in Korea concerns the supply of two double-stage, non-coated fresh water generators to two chemical tankers building at Hyundai Heavy Industries. The units will be fitted aboard Yard No. 866, a 29,900-dwt tanker, and Yard No. 867, an 18,130-dwt tanker. Both are scheduled for delivery in 1994.

For more information on Alfa

Laval Desalt A/S,

Circle 115 on Reader Service Card

Matrix Technologies Wins Military Contract

Matrix Technologies Inc. was awarded a contract from the Defence and Civil Institute of Environmental Medicine for the installation

of the firm's Infonav C12 system aboard Canadian Navy training vessels. The Infonav is a multi-miss software application which can transmit digital data via a high speed wireless link to and from mobile units operating hundreds of miles from a shore base station. Matrix is this month installing the system on four naval vessels operating from British Columbia.

For free information,

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Century Series Type Pump
Pressure: up to 828 Bar (12,000 PSI)
Flow: up to 155 ltrs/min (40 USGPM)

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Two types of sealless, radial piston diaphragm pumps are available, both featuring pressure and flow options without piston changes. Compact and lightweight, Harben pumps are unrivalled in reliability and low maintenance.

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- Affordable voice and fax communication is now possible for coastal, commercial high-seas or private operator.
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- Book shelf mounted electronics unit measures approximately 9 X 12 X 3 inches.
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For further information, contact Mackay... Leaders in maritime communications electronics for over 75 years

300 Columbus Circle, Edison, New Jersey 08837
Tel.: (908) 225-0909 Fax: (908) 225-2848 Tlx.: 4754132 or 4754584

Circle 237 on Reader Service Card

Munson Manufacturing Delivers Five Vessels

Munson Manufacturing, Inc. of Edmonds, Wash., a recognized leader in the design and construction of aluminum workboats, built and delivered five vessels to owners with different needs. Munson Manufacturing built and delivered the vessels to the following owners: the U.S. National Science Foundation (oil spill prevention vessel); the U.S. Geological Survey division (survey vessel); the National Fisheries Research Center (research vessel); the Public Safety Department of Hawaii (marine patrol vessel); and the Hawaiian Islands Council of Honolulu (boom deployment vessel).

Oil Pollution Vessel

The U.S. National Science Foundation took delivery of a vessel designed and built by Munson Manufacturing, the first oil spill prevention vessel in Antarctica.

Power for the 26-foot Hammerhead is provided by 2,800 rpm by a Cummins propulsion unit with Inboard Gear 630 3:1, and a TJIIX Traktor jet. Controls are Kobelt, and other gear includes Raywood 10-inch heavy duty cast aluminum leats.

This vessel will be available to assist if there is an oil spill during the transfer of fuel from tank-



Survey Vessel

ers to the shore of Antarctica.

Survey Vessel

The U.S. Geological Survey division located in St. Petersburg, Fla. needed a vessel to fit specific survey requirements.

The survey vessel designed by Munson Manufacturing is outfitted with three 6V53T, I 400 hp, 2,800 rpm Detroit with Twin Disc Gears, three Hamilton 291 jets, and Hynautic dual station triple controls.

Other equipment includes a Hiab SEA 60 crane, Vickers 12.0 GPM pump, two 12 kW Onan generator sets with paralleling circuit panels, computer test work benches, removable aft deck railings, custom survey transducer wells and a removable flybridge.

Cabin outfitting includes Cruisare 30,000 BTU air conditioning (two units), a Sperry Mark 37 gyrocompass, Sealand Traveler 510 head with SX12 level gauge, F12 Sealand pump, Norcold DE251 dual voltage refrigerator, fresh water system with Torrid MV20 hot water tank with accumulator, Polar P13-1 stainless steel sink, and Princess Seaward P2001 650 watt marine grade microwave oven.



Research Vessel

Research Vessel

The National Fisheries Research Center took delivery of a research vessel designed and built by Munson to accommodate fisheries research on the Columbia River.

(Continued on page 19)

THE Marine Newsletter

is edited for people like yourself ... decision makers. It's packed with need-to-know information that is essential to stay ahead of the competition.

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by first class mail
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In the design and manufacture of all products we apply the same commitment to quality that has earned KBE a reputation for meeting or exceeding customer requirements.

KBE provides integrated logistic support services for its family of products. For rapid response to our customer requirements, our engineering capabilities are complimented by in-house EMI, vibration and environmental test facilities.

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Designers and Manufacturers of Power Conversion Equipment

150 Bluewater Road, Bedford, Nova Scotia, Canada B4B 1G9

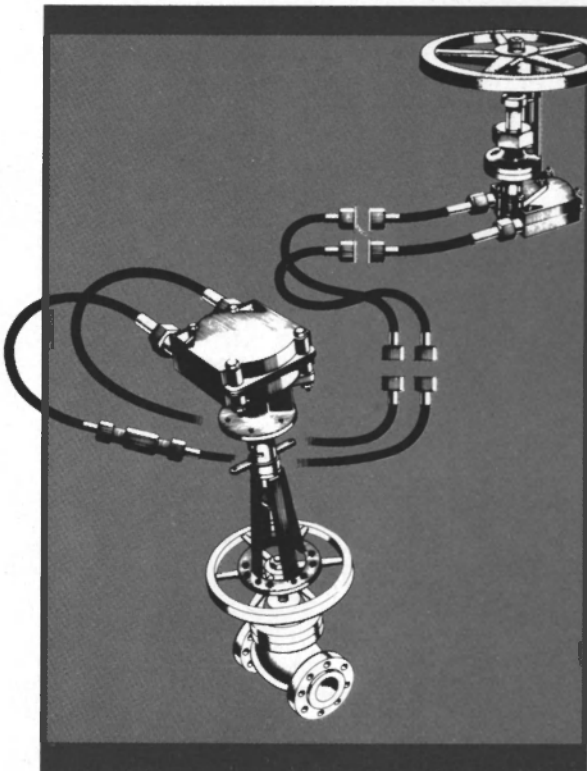
Tel: (902) 835-7268 • Fax: (902) 835-6026

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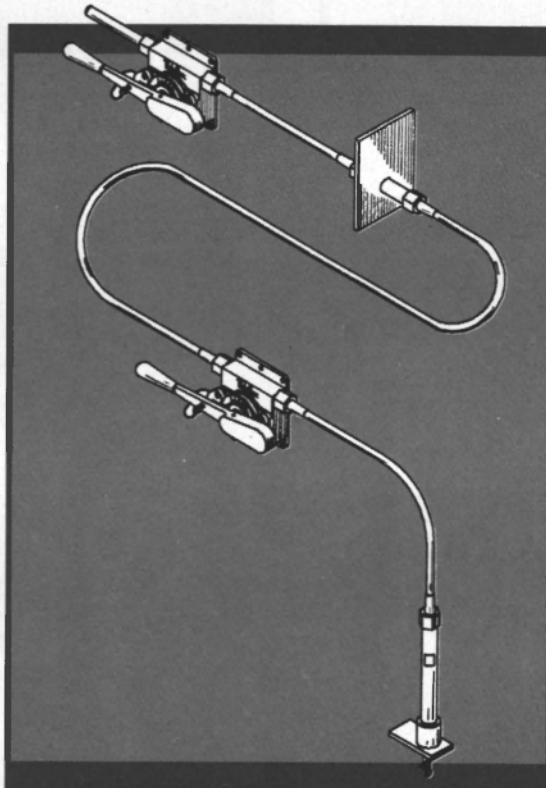
Simpler by design: Teleflex Remote Valve Operators — RMVA, RTVA, and RVVO — are clearly in a class by themselves. Each system employs the Teleflex Flexible Cable Technology to mechanically transfer rotary and linear motion through complex routings over long distances.

Proven Cost Effective: Whatever type of valves you need to operate, Teleflex can provide a system that is easy to install and maintenance free. Teleflex Remote Operator Systems are totally reliable in harsh environments. They are designed to exceed the shock, vibration, and corrosion resistance requirements for naval, commercial marine, and industrial applications. No other equipment comes remotely close.



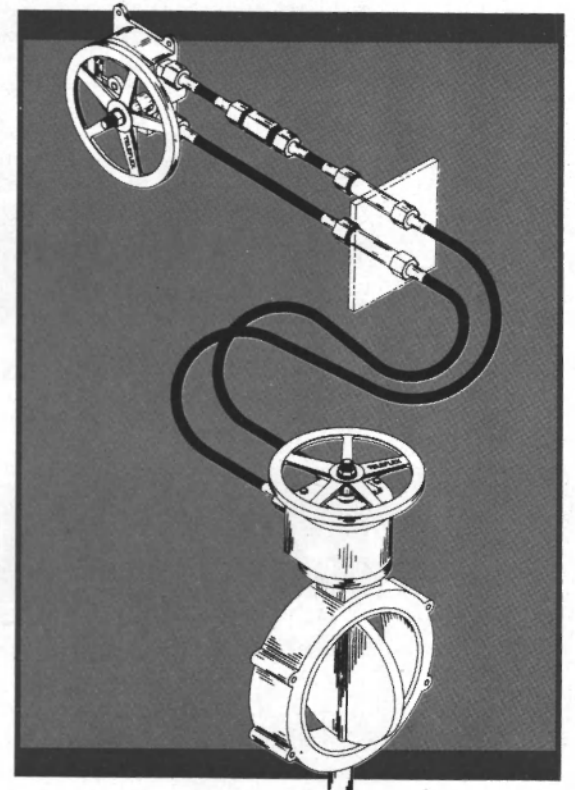
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(Continued from page 17)

Power for the 24-foot Hammerhead research vessel is provided by a Mercruiser. Controls are Morse single lever, single engine. Equipment on this vessel includes Raytheon radar, a Vickers pump, Bloom L-8 winches, a Munson custom trawl gantry designed to accommodate net towing for fish sampling, and a 14-inch by 16-inch Maritime Fabrication anchor winch. This vessel will give the researchers the power they need to perform research in the strong currents and winds on the Columbia River.

Marine Patrol Vessel

The Public Safety Department of Hawaii took delivery of a vessel that satisfied its needs for speed and economy. The 32-foot Hammerhead patrol boat's hull can handle high speeds in heavy seas. Dual Volvo AQAD41/DP engines provide a top speed of 30 knots, and the 200-gallon fuel tank allows up to 30 hours at cruising speed before refueling.

The vessel is equipped with a Gall 6390 AL-FRAN law enforcement light bar, Jabsco candlepower spot/search light, Whelen WS-295 100-watt PA siren, and Titan GX2320B VHF radio.

Emergency rescue operations are assisted by a dive door and dive platform. A Poseidon 3.9 CFM dive compressor, Furuno #1731 radar, Sitex five-channel GPS plotter, Alden #406 EPIRB, Aquameter 147 compass, Bentley's pilot chair and Sealand #510 marine head complete the outfitting package.

Boom Deployment Vessel

The Clean Islands Council of Honolulu, Hawaii needed a solid, dependable boom deployment vessel to complement its fleet. The Council found what it was looking for in a Munson 24-foot Hammerhead.

The boat is outfitted with dual OMC (Johnson), 175 hp outboard engines with dual binnacle OMC controls. Steering is Morse hydraulic.

A Boaters' Best 850 LB manual strap winch activates the bow door. The vessel is equipped with heavy duty marine grade Baywood 10-inch cast aluminum cleats, Aqua Signal Series 20 navigation lights and Stewart Warner Quartz Hobbs dual deck floodlights. A Sealand 964 head system is installed in one of the two forward lockers.

For more information on Munson Manufacturing, Inc.,

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Hagglunds And MacGregor-Navire Join Forces

The Swedish industrial group INCENTIVE has acquired shares of MacGregor-Navire from the Finnish KONE Corporation.

MacGregor-Navire is a global market leader in shipboard cargo handling products and services. Products include hatch covers, Ro/Ro equipment, shipboard elevators and cranes, cargo lashing systems, refrigerated cargo holds and liquid cargo handling systems.

INCENTIVE is also the owner of Hagglunds Marine, a world leader in shipboard cranes.

By joining the forces of MacGregor-Navire and Hagglunds Marine, INCENTIVE will create what it calls "the strongest organization within the shipboard cargo handling business." The new group will be a leader in hatch covers, marine cranes, Ro/Ro equipment, marine elevators and related services. This enables the group to offer shipowners and shipbuilders worldwide all aspects of shipboard

cargo handling solutions. Through the 30 companies located in major shipping and shipbuilding countries, the group will expand its local presence worldwide and enable the organization to improve its customer service. In related news, an order to supply Class Standard cargo handling equipment for one of the latest series of U.S. Navy Strategic Sealift Ships that was awarded to MacGregor-Navire and Hagglunds Marine has been confirmed, with options for up to 19 further shipsets. The equipment to be supplied to

each vessel includes a slewing stern ramp, stern door, sideport/platforms and a portable ramp from MacGregor-Navire; and twin cranes, Hyster container lift and forklift trucks from Hagglunds Marine.

For more information on MacGregor-Navire,

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For more information on Hagglunds Marine,

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DRS Awarded Contracts Worth Over \$6 Million

Diagnostic/Retrieval Systems, Inc. (DRS) received letter contracts valued in excess of \$6 million from the Oceanic Div. of Westinghouse Electric Co. For these contracts, DRS will produce upgraded AN/AQS-14 recorder/reproducer systems and sonar image display simulators. The system will be used on Navy helicopters to detect mines

located in critical ocean-floor areas. For more information on DRS,

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Alden Debuts Search & Rescue Transponder

Alden Electronics, Inc. introduced the Aldensart™ search and rescue transponder, which is designed to help rescue forces find a vessel, life

raft or personnel in distress, especially in poor visibility. The Aldensart responds to radar signals on rescue planes of ships by "painting" its location on their radar screens. This painted signal is seen on the radar as a series of 12 highly-visible dashed lines pointing directly to the location of the Aldensart. The unit operates in the 9GHz frequency band. For free information on Alden Electronics' new safety product,

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Metro Machine Corp. Honored By EPA

The U.S. Environmental Protection Agency (EPA) has honored Metro Machine Corp. for helping to protect America's air and water. The EPA has awarded its 1993 "Excellence in Environment Education" recognition to the Norfolk-based ship repair and modernization firm. Metro's environmental achievement was selected for the single award from applications of businesses and industries in the five-state EPA Region III. Metro Machine, which was officially presented the award at an October 1 luncheon, is an employee-owned small business which operates a shipyard and that repairs and modernizes U.S. Navy non-nuclear surface ships in Norfolk. For more information on the company,

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Kennar Technics AB Launches Pressure Monitoring System

Kennar Technics AB recently launched a new portable cylinder pressure monitoring system, with accurate data and plots running in Windows™. The new system, dubbed "The Doctor," is accurate because it takes pulses from the flywheel teeth for a true crank angle and it uses the Kistler piezo-electric type pressure transducer, not a strain gauge type. For free information on the new system from Kennar Technics,

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Peterson Builders Reaches Agreements With Royal Schelde And FBM Marine

Peterson Builders, Inc. (PBI) of Sturgeon Bay, Wis., announced that it has reached a non-exclusive agreement with Royal Schelde Shipbuilding of The Netherlands and with FBM Marine of Cowes, Isle of Wight, England to market and produce under license a wide range of high-speed passenger and passenger/car vessels.

The designs include a range of Surface Effect Ships (SESs), high-speed catamarans, low-wash catamarans, fast displacement (SWATH-type) catamarans and high-speed mono-hulls. The ability to produce such a wide selection of vessels will allow PBI to meet specific demands with regard to speed, capacity, and operational conditions for the vessels, including environmental requirements for low-wash generation.

The recent passage of legislation in Indiana allowing gaming vessels on Lake Michigan has given PBI the immediate opportunity to offer these designs configured to suit the varying operational conditions of the Great Lakes.

Maritime Reporter/Engineering News



Dunlop-Beaufort's MEC Evacuation System installed on six newly built Canadian Car Ferries

This compact and simple system allows efficient and controlled evacuation of large numbers of passengers off vessels (particularly off those with high freeboard). The chutes have been installed on six new Canadian-built ferries, including the two new British Columbia Super Ferries, and are operational in the Ontario Northland and east coast Northumberland ferry fleets. The MEC is currently specified on several new American vessels to be built in 1993-1994.

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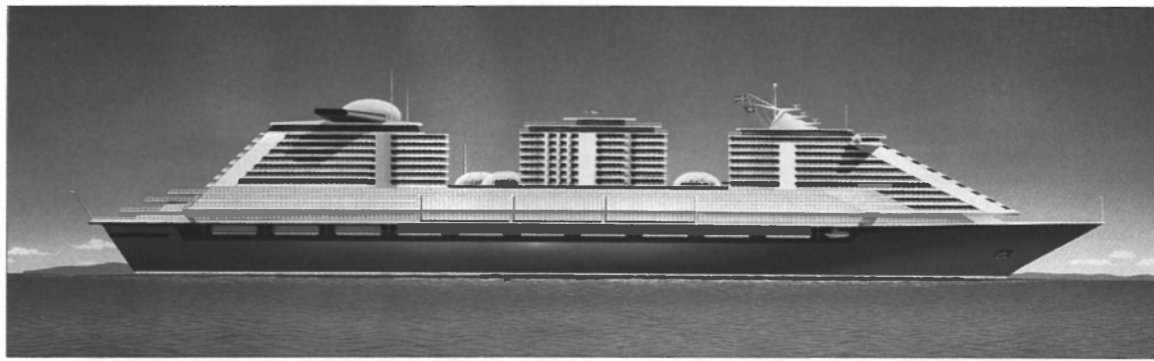


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PHOENIX WORLD CITY

Landmark Passenger Ship Intends To Boost U.S. Maritime Industry Into International Commercial Competition

The longstanding Phoenix World City project has taken on some exciting new dimensions since last reported on in these pages, new dimensions which make the billion dollar-plus, 250,000-grt passenger ship project an even stronger candidate to provide the spark to revitalize commercial shipbuilding in the U.S.

Since the building of the Phoenix World City could potentially provide an unprecedented boost to the U.S. maritime industry into the competitive international commercial market, a broad range of American shipyards, corporations and organizations are proposing creation of a new concept in shipbuilding to undertake the task; a "virtual shipyard" on a national scale.

To quickly recap, the 5,600-berth Phoenix World City is the brainchild of **Knut Utstein Kloster**, now chairman of the World City Corporation. In 1990, World City approached U.S. shipyards for construction of the ship in the U.S.



Members of the World City team visit the corporation's exhibit at the Centennial Exposition of the Society of Naval Architects and Marine Engineers in New York last month: (left to right) Knut Utstein Kloster, chairman; Tage Wandborg, senior architect and designer; John S. Rogers, vice chairman and CEO; Richard Baumler, senior marine engineer; and James Dolan, recently retired senior vice president of American Bureau of Shipping.

for operation under the American flag. Avondale Industries contracted to complete the technical bid package for the ship, and the technical package has now been further updated by Newport News Shipbuilding.

According to **John S. Rogers**, CEO of World City Corp., Phoenix World City is now contract ready.

What is needed, he said, and what World City has been working to create, is a national shipyard consortium positioned to build the ship (which would be longer than a U.S. Navy Nimitz-class aircraft carrier) on a cost-effective basis. In essence, World City is now trying to "build the shipyard to build the ship."

The result: the virtual shipyard concept, for which World City and 52 other industry participants have joined in an application for funding under President Clinton's Technology Reinvestment Program (TRP).

Administered by the government's Advanced Research Projects Agency (ARPA), awards under the TRP program are expected to have been announced by October 1.

Given appropriate government support for its shipbuilding industry, hard-hit by declining defense work, Mr. Rogers believes that the first of a series of three Phoenix World City-class ships could go to contract within 12 months, "an ambitious time frame," he concedes, "but a doable one if all interests that stand to gain, both private and governmental, work together."

A broad and diverse array of U.S. shipbuilders, corporations and organizations, ranging from the U.S. Navy to the American Bureau of Shipping (ABS), and leading educational centers, to Fortune 500 companies such as Du Pont, AT&T, GE, Caterpillar and 3M, are proposing and planning the creation of the "virtual shipyard," a project that will combine and coordinate American industrial and technological resources into an integrated world-class commercial shipbuilding operation.

According to Mr. Rogers, the virtual shipyard is right for the U.S. industry because: it's market driven, based on a fully-developed product designed to tap and leverage major existing commercial revenue streams, not just in the \$5-

billion-plus cruise industry, but the 10-times-larger meeting and conventions market; and it requires no change in legislation, as it capitalizes on existing tools and resources available to government.

The Virtual Shipyard

Adopting and applying current concepts of virtual corporations and agile manufacturing, a virtual shipyard replaces the vertical integration of a traditional yard with electronic integration among multiple yards, and enhancement of

Westinghouse Technology For Dual Use In World City Project

Westinghouse's Marine Division, which is developing the U.S. Navy's next-generation gas turbine engine, the WR-21, is supporting a World City Corp. proposal to the Advanced Research Project Agency (ARPA) to use the technology in the Phoenix World City American Flagship to construct the world's largest passenger ship in U.S. shipyards. For Phoenix World City, Westinghouse WR-21 Intercooled Recuperated (ICR) engines would provide propulsion through an electric drive system, and supply energy to meet the power demands of the ship's hotels and facilities. Westinghouse is developing the efficient and environmentally-friendly ICR marine gas turbine to power the Navy's newest warships.

Selection of the ICR gas turbine for this project was reportedly driven by the engine's ability to provide all of the benefits of a gas turbine with the fuel efficiency of a diesel. The ICR engine's size, weight, expense and vibration characteristics also reportedly prove favorable.

Answering The Questions

Since its inception, the Phoenix World City project has—as any landmark billion dollar project will—weathered questions and comments from “doubting Thomases,” said World City Corporation CEO **John S. Rogers**, despite the resounding support of a wide array of business, government, labor and educational leaders.

Comment: It (the plan for the Phoenix World City) has been around for so long.

Rogers: Figures show that World City is well within the “gestation period” for any innovative billion-dollar project.

Question: Why build it in the U.S.?

Rogers: The U.S. has enormous physical shipbuilding facilities freed up by declining defense work. U.S. shipyard wage rates are below Continental and Japanese levels. There is a great store of technology and skills with which the productivity of the shipbuilding industry, like other industries, can be fully restored.

Comment: Supply (of passenger ship space) will surpass demand.

Rogers: Factors such as cruise market growth rates and the depletion in overall berths at and after 1997 as the result of new international safety rules drive out older ships are obvious. But also, the fact is that the American-flag Phoenix World City will be able to trade in markets that the existing foreign flag fleet cannot enter, including the meeting market and U.S. coastwise itineraries.



their processes and personnel skills, in a manner that supports and improves upon current concepts of modern ship design and construction.

As Mr. **Rogers** simply puts it, the virtual shipyard is not exclusive, as it's an open invitation to any U.S. shipyard, supplier or technology to involve itself in the enterprise.

The present group assembled includes: Avondale Industries; Bender Shipbuilding; Bethlehem Steel, BethShip Division.; Ingalls Shipbuilding; The Jonathan Corp.; Newport News Shipbuilding & Repair; Norfolk Shipbuilding; Peterson Builders; Southwest Marine; Tampa Shipyards; and Trinity Marine. Additionally, there have been some notable late additions to the virtual shipyard team. Charleston Marine Manufacturing Corp. (which hopes to utilize the resources of the soon to be closed Charleston Naval Shipyard), and the Army's Rock Island Arsenal in Illinois (as a potential manufacturer of precision parts).

This group represents more than 50 percent of the U.S. shipbuilding capacity.

The U.S. Navy, which has a vested interest in post-Cold War shipbuilding capacity, joined the World City TRP proposal, reportedly prompted by the plan's support of objectives parallel to its own Affordability Through Commonality (ATC) Program.

For example, World City is interested in the Westinghouse Marine environmentally-friendly WR-21 Marine Gas Turbine Propulsion engine, the same engine under development to power the Navy's next generation of warship (see related story, previous page).

Also, the U.S. Coast Guard (USCG) has formed the Phoenix World City “tiger team.” The tiger

team, which involves eight USCG project officers who are working with World City and ABS, was developed to facilitate and ensure compliance with inspection procedures and safety standards.

From Concept To Contract

The process leading up to the final contract calls for detailed construction planning and assessment.

Tasks to be completed include production planning for construction of the ship on modular, multi-yard basis; an inventory of shipyard resources (deciding which yards will perform which tasks); creation of an enterprise framework and electronic infrastructure for the virtual shipyard; development of a “should” cost analysis; securing a final actual cost; and contract.

Beyond all of the assessments and analysis, funding for the vessel must be secured as well. The World City's financing plan is based on Title XI loan guarantees. “If this country wants to save its shipyards, the money should be set aside to support the Title XI program for ventures which are commercially sound,” said Mr. **Rogers**.

“The ship is like a great economic engine, from which a broad base can profit—not only shipyards and suppliers, but the men and women who staff the ship, the U.S. ports and tourism industry where the ship calls, and the government's own benefits in tax revenues and trade balance.”

For additional information on the companies mentioned in the article, involved with the Phoenix World City Project, circle the appropriate number on the Reader Service Card bound in this issue.

AT&T	88
Avondale Industries	89
Bender Shipbuilding	90
Bethlehem Steel, BethShip Div.	91
Caterpillar	92
Ingalls Shipbuilding	93
The Jonathan Corp.	94
Newport News Shipbldg.	95
Norfolk Shipbuilding	96
Peterson Builders	97
Southwest Marine	98
Tampa Shipyards	99
Trinity Marine	100
Charleston Marine Mfg.	101
Westinghouse	102

Spanish Yard Wins ISNASA Contract For \$6 Million

The Juliana Constructora Gijonesa shipyard has signed a letter of intent by the ISNASA ferry company to build two vessels for a total of \$6 million.

Part of the state-owned Astilleros Espanoles group, Juliana reportedly plans to bring back its full labor force for the new project, which it hopes will secure the company's fi-

nances for at least two years.

The letter of intent was signed by Astilleros President **Juan Saez** and **Victoriano Salayero** of ISNASA.

The first vessel will be 492 feet long with a 1,256-passenger capacity and 93 articulated trucks. It will be capable of 23 knots and operate between mainland Spain and North Africa.

Some financial details have yet to be worked out, but Juliana has promised to start work even before the contract is completely financed.

Astilleros President To Leave Shipbuilding

Juan Saez, president of Astilleros Espanoles (AESAs) and a leader in European shipbuilding, is reportedly leaving the shipbuilding industry.

Mr. Saez will reportedly leave his post to join the national Spanish airline, Iberia. One of Europe's senior shipping figures, naval architect Mr. Saez has been in the ship-

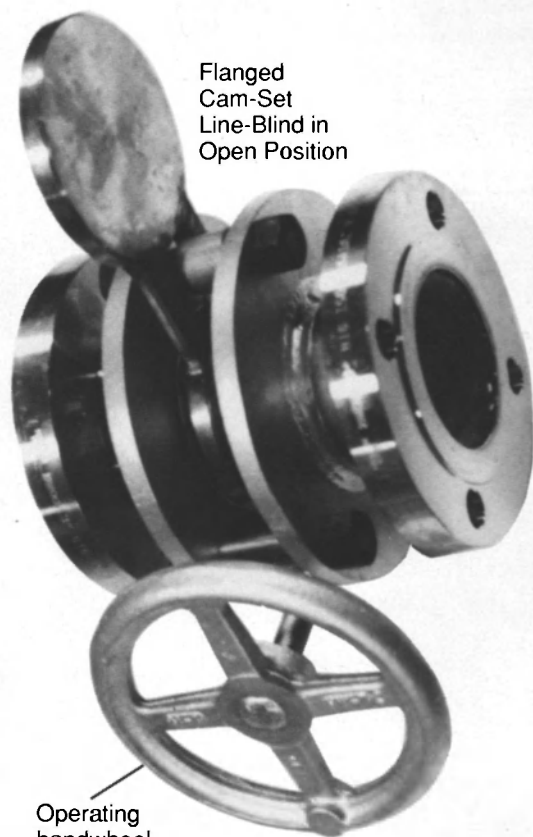
building industry his entire career and has run the state-owned company for three years. Aside from playing a key role in encouraging European shipbuilding to unite and strive to be competitive with the Far East, he was also a major impetus behind the E3 VLCC project, which pooled the resources of the eight AESA yards to work on a design for a new double-hulled tanker. Two of the tankers have been ordered by Spanish owner Naviera Tapias.

Mr. Saez is a past president of the Western European Shipbuilders' Association.

Furuno Debuts New 10-Inch Radar Series

Furuno U.S.A. Inc. introduced a new line of mid-range, high-performance 10-inch radars, models 1831, 1931 and 1941. The new radars come in three models with up to 16 range scales from just one-eighth nautical miles all the way up to 24, 36 and 48 nautical miles. They combine trackball, push-button and rotary controls for ease and speed of operation. The new radars use a high-resolution, non-glare CRT as well as automatic control of tuning and anti-clutter, with manual backup, to provide the clearest possible picture. They also feature an echo trail, so all targets on screen simultaneously can be tracked with the touch of one button. Finally, these radars offer a unique feature called the "centralized nav monitor" mode. This mode lets the operator consolidate all data from other NMEA 0183 nav instruments onto a single, full-screen display. For more information from Furuno,

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Tracor Completes Acquisition Of Vitro

Tracor, Inc. completed the previously announced acquisition of Vitro Corporation and its subsidiaries from The Penn Central Corp.

Tracor bought Vitro from Penn Central for \$94 million in cash, subject to a post-closing working capital adjustment. "This acquisition more than doubles the size of Tracor and represents a major milestone in our growth strategy," said **James B. Skaggs**, Tracor's president.

Tracor, with annual sales of \$262 million before the acquisition, provides a broad range of technological products, systems and services for diverse U.S. government, international and commercial markets. Tracor, with its largest subsidiary, Vitro Corp. (which has annual sales of \$414 million) is a major management and engineering services contractor, supporting systems engineering, design, production, integration, operation and maintenance of electronic systems for ships, aircraft, missiles and complex computer systems.

For more on Tracor,

Circle 12 on Reader Service Card
Maritime Reporter/Engineering News



An aerial view of Blohm & Voss' shipyard located in Hamburg, Germany.

Blohm & Voss Nominates Wesley D. Wheeler As Agent

Wesley D. Wheeler, a N.Y.-based naval architecture and marine engineering firm, has been chosen by Blohm & Voss AG (B&V), as its agent. B&V is member of the Thyssen Industrie Group, and has been the worldwide synonym for inventiveness and efficiency since the delivery of its first ship on the banks of the Elbe in 1880.

Wesley D. Wheeler will be concentrating on the service/repair/conversion marketing activities.

For more information on Blohm & Voss from Wesley D. Wheeler,

Circle 1 on Reader Service Card

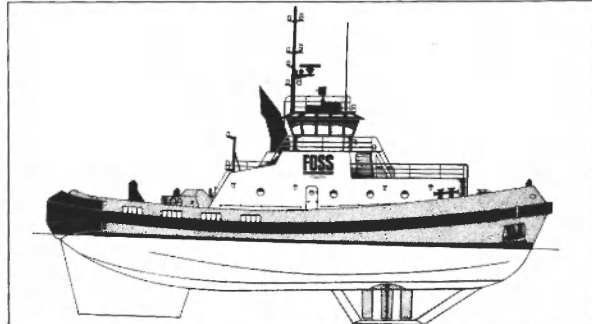
Foss Maritime And SeaRiver Maritime, Inc. To Provide Bay Area Tug Service

Foss Maritime Company and SeaRiver Maritime, Inc. have entered into an agreement com-

mencing on or before Sept. 1, 1993, to provide tug services in the San Francisco Bay area under the name Foss-SeaRiver.

Under the agreement, Foss-SeaRiver will maintain a pool of tugs available for vessel and tug/barge escort, docking and assist services. The initial pool of tugs consists of three large conventional SeaRiver tugs and one Foss cycloidal propeller tractor tug, called the Foss Water Tractor.

SeaRiver will add a third large tug to two tugs which have been engaged in tanker escort and dockings in the area for some time. Foss is now expanding its California operations to the Bay area, having been actively engaged in Los Angeles/Long Beach and San Diego Harbors for more than 60 years.



The Foss Water Tractor to be used in tug services in the San Francisco Bay.

Foss, which was founded 104 years ago, has 18 years of experience in tanker escorts in Puget Sound, and has operated six tractor tugs for more than a decade.

In addition, Foss operates a fleet of 60 tugs and 60 barges in various locations on the U.S. West Coast.

For more information on Foss-SeaRiver,

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Electro-Motive "EC" Engine Conversion Provides Improved Fuel Economy

MKW Power Systems, Inc., the authorized distributor for Electro-Motive Division of Gen-



MKW Power Systems outfitted the R/V Oceanus with an "EC" upgrade package on its 16-cylinder 645E5 main engine.

eral Motors (EMD) Diesel Engines on the East Coast, recently installed an "EC" upgrade package on the 16-cylinder 645E5 main engine of the Research Vessel "Oceanus."

The Oceanus is operated by the Woods Hole Oceanographic Institution. This vessel has a controllable-pitch propeller that closely matches the shaft power requirement with the available engine horsepower. The Oceanographic Institution reports operational monitoring delivers fuel savings approaching 10 percent.

Paul Glandt, general manager of service, says that all owners of EMD 645E5 and 645E7 diesel engines built after July 1972 can benefit from the "EC" upgrade package.

Installation of recent production components that modify the engine to the 645E7C configuration have demonstrated that fuel savings of eight percent are typically attained when upgrading older engine models.

In addition, the "EC" conversion also provides the opportunity to install current production EMD components of improved design.

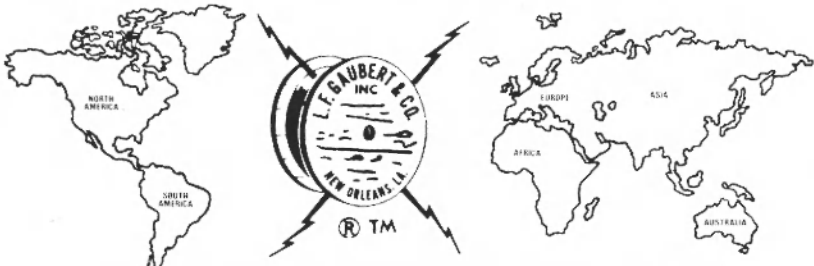
New-design full bore laser-hardened cylinder liners and EMD "premium" pistons with induction-hardened upper ring grooves reportedly provide significant advances in durability, as well as improved fuel economy.

For more information on the upgrade from MKW Power Systems,

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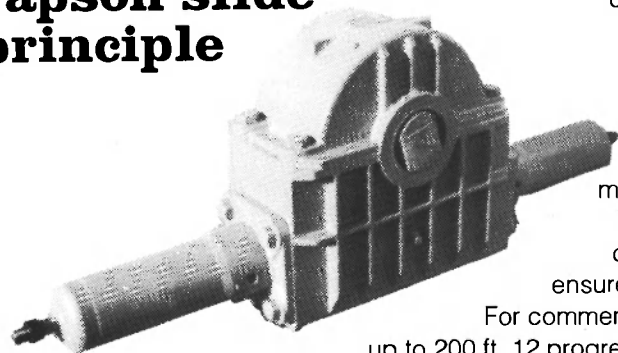
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Pentagon's 'Bottom Up' Review: One Contract Each For Newport News And Electric Boat

As part of a "bottom up" review of post-Cold War defense needs released by Defense Secretary **Les Aspin**, the Pentagon recommends that the Department of Defense (DOD) continue bolstering its surge sealift fleet, that Newport News

Shipbuilding, a Tenneco subsidiary, get a \$3 billion contract to build a new aircraft carrier, and General Dynamics' Electric Boat division, a competitor of Tenneco's, build the third Seawolf submarine.

The recommendations were intended to reflect the new defense requirements of the U.S., which, instead of contending with a superpower, must now contend with what **Mr. Aspin** reportedly called "regional bullies" like **Saddam Hussein**.

Electric Boat, of Groton, Conn., was given the contracts for the first two Seawolf subs.

The Pentagon decided to maintain this course to support the continued existence of both the nation's nuclear shipyards. Electric Boat has also been recommended as the designer/builder of the next generation of attack subs.

Newport News is the only U.S. yard that can build, overhaul and refuel nuclear surface ships, and it is currently building two carriers

and six earlier-generation subs.

The Pentagon said it will strive to improve the mobility of U.S. force by purchasing additional Ro/Ro vessels for their surge sealift fleet. Purchasing the ships, which may number as many as 20, has been an issue since the Pentagon's Mobility Requirement Study was sent to Congress in 1992.

The Navy, which has been accepting bids on the ships, has also said it would spend \$1 billion for the conversion of five containerships to Ro/Ro's.

The Pentagon's other recommendations include improving the responsiveness of the Maritime Administration's Ready Reserve Force (RRF).

The Pentagon's recommendations have yet to receive Congressional approval, and Newport News is expected to continue striving for the third Seawolf contract.

Electric Boat's number of employees has shrunk from 25,000 to about 18,000 since the defense spending of the Reagan era. Even should the new contracts for construction and design be approved, that number is reportedly projected to shrink as low as 7,800 by 1997.

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Singmarine Unit Wins \$6 Million 'Cat' Contract

Singmarine Industries Limited, through its subsidiary Aluminum Craft Pte. Ltd., won a shipbuilding contract from a repeat customer in South China.

The contract, worth about \$6 million, is to build a 115-foot catamaran for a state-owned company in Wan Shan District of Zhuhai City, South China.

The first vessel for the customer, a 92-foot monohull ferry, "Tong Chi Yi Hao," was recently delivered.

"We (were) impressed by Aluminum Craft's excellent workmanship and technical competence in the construction of the monohull ferry, and are confident that they will continue to maintain these standards in the building of the catamaran," said **Pan Qing Hong**, regional director and general party secretary of Wan Shan District in Zhuhai City.

Two high speed diesels driving fixed-pitch propellers will power the vessel to 29 knots in calm waters. This aluminum ferry will have a capacity for 250 passengers and eight crew. It is scheduled for delivery in the first quarter of 1994 and will be deployed along the coast of Zhuhai. For more information,

Circle 45 on Reader Service Card

NNS Wins \$10.3 Million Navy Repair Contract

Newport News Shipbuilding, Newport News, Va. has been awarded a \$10.3 million Navy Repair Contract for the post-shakedown availability of the "Montpelier" (SSN 765) nuclear-powered submarine.

Maritime Reporter/Engineering News

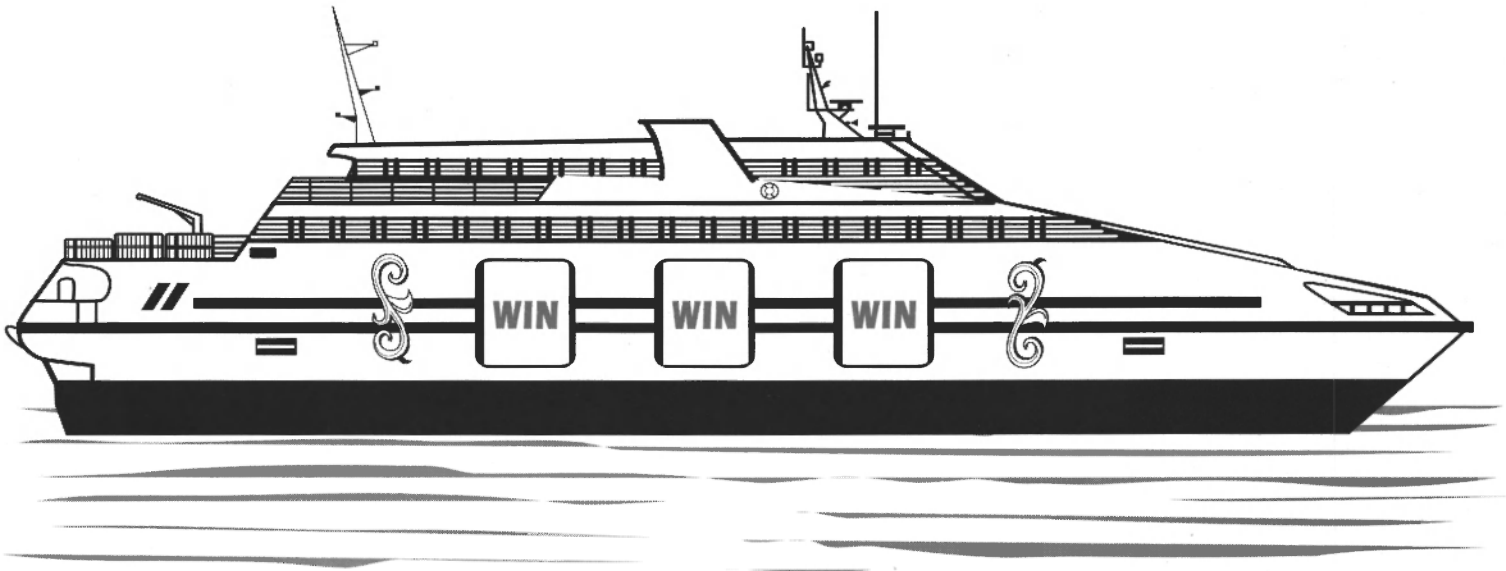
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A.D.S. Honors Cummins With Technical Award

The Association of Diesel Specialists (A.D.S.) has recognized Cummins Engine Company, Inc., Columbus, Ind., with its highest technical honor, the Henry Ortner, Jr. Memorial Technical Award.

The award was presented to Cummins in early August during the A.D.S.'s 46th International Convention & Exhibit in Las Vegas.

James E. Blewitt, A.D.S.'s president, made the presentation to **Al Satterfield**, Cummins' manager of automotive OEM service, who is also a member of the Association's board of directors.

Cummins Engine Company is the second corporate member of A.D.S. to receive the Ortner Award. Cummins was cited for its ongoing support of A.D.S. technical programs and for making its own technical resources, including training courses and product literature, available to A.D.S. Service Members.

Reintjes Announces Berg Propulsion Acquisition

Reintjes GmbH announced it has become the majority stockholder of Berg Propulsion, a Swedish builder of controllable pitch propellers, bowthrusters and propulsion control equipment.

Reintjes and Berg, which both serve the marine market exclusively, intend to offer complete integrated propulsion systems engineered to

give vessel owners machinery packages in compliance with worldwide requirements with regard to ship safety, economy and environmental considerations.

Reintjes, established in 1929, is a leading manufacturer of marine gearboxes and currently produces gear units in a propulsion range of 200 to 10,000 kW (270 to 13,400 hp). More than 70,000 gearboxes have been built for service in every type of vessel worldwide.

Berg began controllable-pitch propeller production in 1927, and currently manufactures shaft systems up to 12,000 kW (16,000 hp). In excess of 6,000 shaft systems have been produced to date.

Karl Senner, Inc. of New Orleans represents both Reintjes and Berg in the U.S. and Canada, and has placed in service more than 2,000 Reintjes gearboxes and 35 Berg propeller systems.

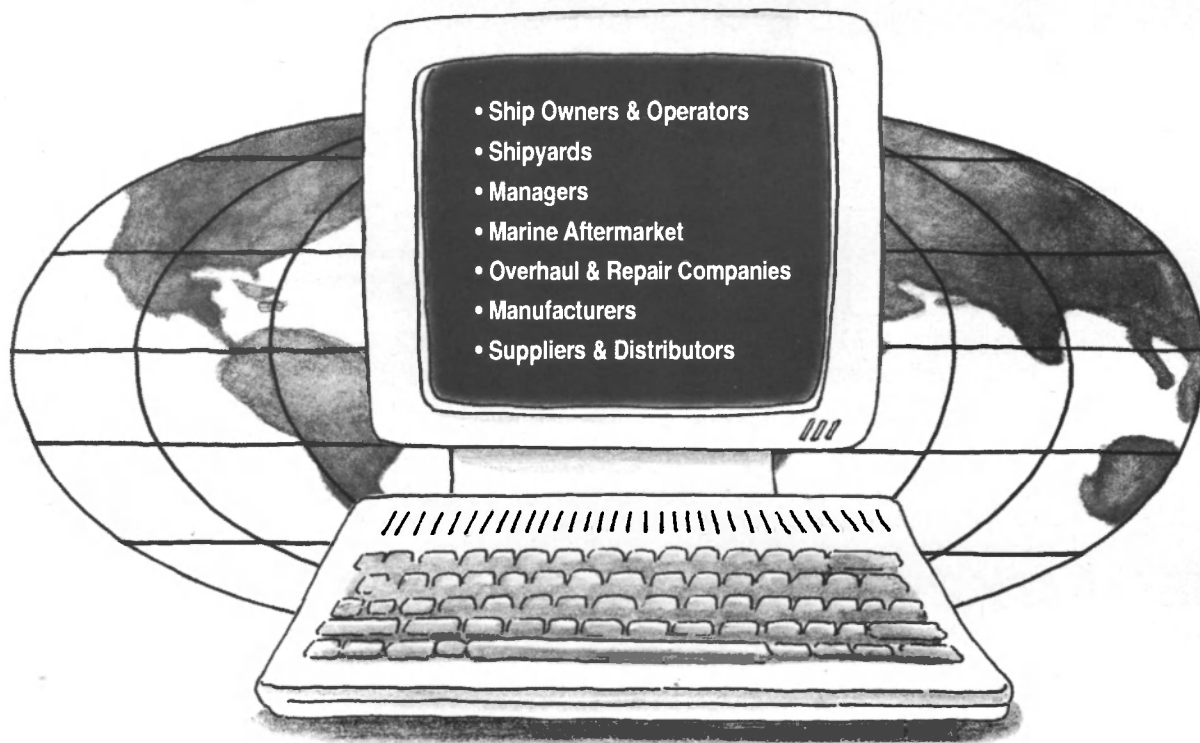
For more information on Reintjes,

Circle 59 on Reader Service Card

For more information on Berg Propulsion,

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The Global Marine Parts Department...



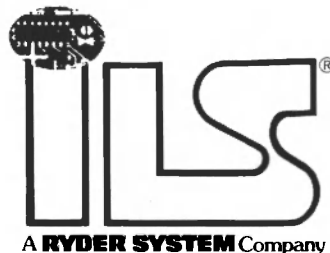
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Avondale Wins \$262 Million-Plus Contract

Avondale Industries Inc., New Orleans, La., has won a \$262 million contract from the Navy for construction of one Strategic Sealift Ship, with options for five additional ships.

The total value of the six-ship contract will be in excess of \$1.3 billion.

The Strategic Sealift vessels are Ro/Ro-type ships, which are designed to quickly carry tanks and other military vehicles to any area of potential conflict.

The first ship is scheduled for delivery in 1997, and the sixth for delivery in the year 2001.

Albert L. Bossier, Jr., Avondale's chairman, president & CEO, said, "With the award of the Sealift contract, we now expect to be able to stabilize the size of our work force through the year 1997. This contract will position Avondale as a leader in the construction of sealift and amphibious vessels for the U.S. Navy and enable the company to capitalize on commercial opportunities. The recent performance of Avondale's experienced work force positioned us to be selected as the successful shipbuilder for this important program."

The Sealift ships will be 950 feet long with a 106-foot beam. The ships will achieve a sustained speed of about 25 knots at the design load condition at 90 percent MCR. Propulsion will be by medium speed diesels. The award of this contract reportedly will have a substantial impact on the economy of the state of Louisiana.

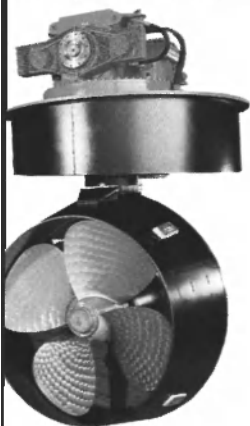
For more information on Avondale Industries,

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F/V Sea Storm

FISH EXPO '93

The world's largest commercial fishing trade show, Fish Expo '93, returns this year to Seattle. Fish Expo '93 splits its time between the U.S. East Coast and West Coast, appearing in Boston in even-numbered years and Seattle in odd-numbered years. The show is scheduled to run October 20-23, 1993 at the Seattle Center, Washington. More than 24,000 visitors are expected to visit the show, which will include over two miles of exhibits - 768 companies and 1,150 booths featuring vessels, supplies, engines, nets, electronics, gear, marine related services, seminars, demonstrations, forums and workshops.

Practical workshops and hands-on demonstrations that will cover trouble shooting and repair techniques for propulsion, hull and

mechanical systems onboard vessels will be available for attendees to participate in. Forums are scheduled at various times over the course of the show, including:

- Free safety and survival training sessions. Vessel operators must provide their crews with training in specific areas such as abandoning ship, fire fighting and recovering someone from the water. Professional trainers will offer instruction on these procedures, and certification is offered.

- Congressional Forum, also interactive forum, where legislators and aides from Congress will discuss fisheries issues that affect the fisherman directly. This forum provides an opportunity to question lawmakers about current and proposed regulations.

- Coast Guard Forum, an interactive where attendees can hear the most recent in enforcement, safety and licensing activities from Coast Guard officers. Find out what your rights and obligations are when the Coast Guard hails you and boards your boat.

Seminars scheduled for attendees include:

- Individual Fishing Quotas (IFQs) seminar. Questions such as "who gets what?" and "how will quotas be bought and sold?" will be answered by representatives from

the fishery management councils.

- North American Free Trade Agreement: How will it affect fishermen in U.S. and Canada? Also to be discussed: current obligations and entitlements from the U.S.-Canada Salmon Treaty. Top level insiders from both sides of the border will debate free trade.

For additional information on Fish Expo '93, contact: Diversified Expositions, 5 Milk Street, P.O. Box 7437, Portland, Maine 04112-7437; tel: (207) 772-3005.

Exhibitor List (partial)

AAA Fire & Safety Inc.
 Arctic Marine Refrigeration Inc.
 Aardvark Corporation
 ACR Electronics Inc.
 Action Marine Equipment Inc./Envirovac
 Advanced Marine Technology
 Airmar Technology Corp.
 Ak-Wa Inc.
 Alaska Diesel Electric
 Alden Electronics Inc.
 Alfa-Laval Marine & Power
 American Bow Thruster
 American Bureau of Shipping
 American Design & Manufacturing
 American Hose & Fittings Inc.
 American Manufacturing Co. Inc.
 American Mobile Satellite Corporation
 American Pioneer Inc.
 American VULKAN Corporation
 AMI Marine Products
 Anderson Marine Repair Inc.
 Apex Equipment Inc.
 Aquadrive Systems
 Aqua Signal Corporation
 Argo International-Marine Division

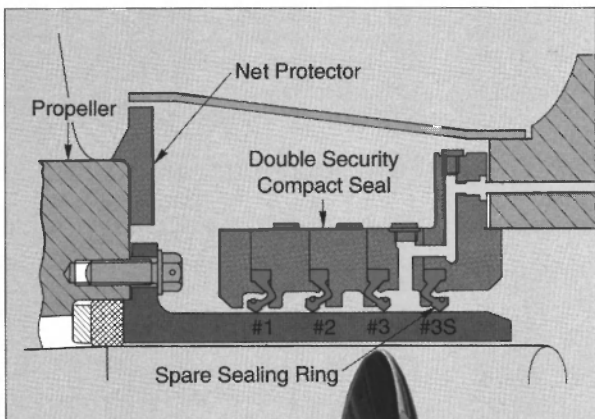
Aronson Campbell Industrial Supply
 AT&T Maritime Services
 Atlas Industries USA Inc.
 AT&T Submarine Cable Protection
 Autofisk A/S
 AutoSHIP Systems Corporation
 BayleySuit Inc.
 Baywood Inc.
 Bearings Inc.
 Bender Shipbuilding & Repair Co. Inc.
 BF Goodrich Co.
 B&G Machine Inc.
 Bird Johnson Company
 Blohm + Voss AG
 Branom Instrument Company
 Buchanan Air Inc.
 Canadian Hydrographic Service
 Carnitech U.S. Inc.
 Carolina Cockpit
 Carson Industries Inc.
 Cascade Machinery & Electric
 Caterpillar Inc.
 Cetrek USA
 Chevron USA Products Co.
 Coastal Marine Engine Inc.
 Coastal Refrigeration Mfg. Inc.
 Coastline Equipment Inc.
 ComNav Autopilots
 COMSAT Maritime Services
 Continental Western Corporation
 Cornell Pump Company
 Cosalt International Limited
 Cospolich Refrigerator Company
 John Crane Marine
 Crowley Marine Services Inc.
 Cummins Marine
 Cushman Boats
 DACO
 VM Dafoe Machine Shop Ltd.
 Dantronics Inc.
 Datrex Inc.
 Deere & Company
 Dekker Engineering Inc.
 Delta Marine Industries Inc.

Show Dates and Times

Wednesday, Oct. 20	10:00 a.m. to 6:00 p.m.
Thursday, Oct. 21	10:00 a.m. to 6:00 p.m.
Friday, Oct. 22	10:00 a.m. to 6:00 p.m.
Saturday, Oct. 23	10:00 a.m. to 5:00 p.m.

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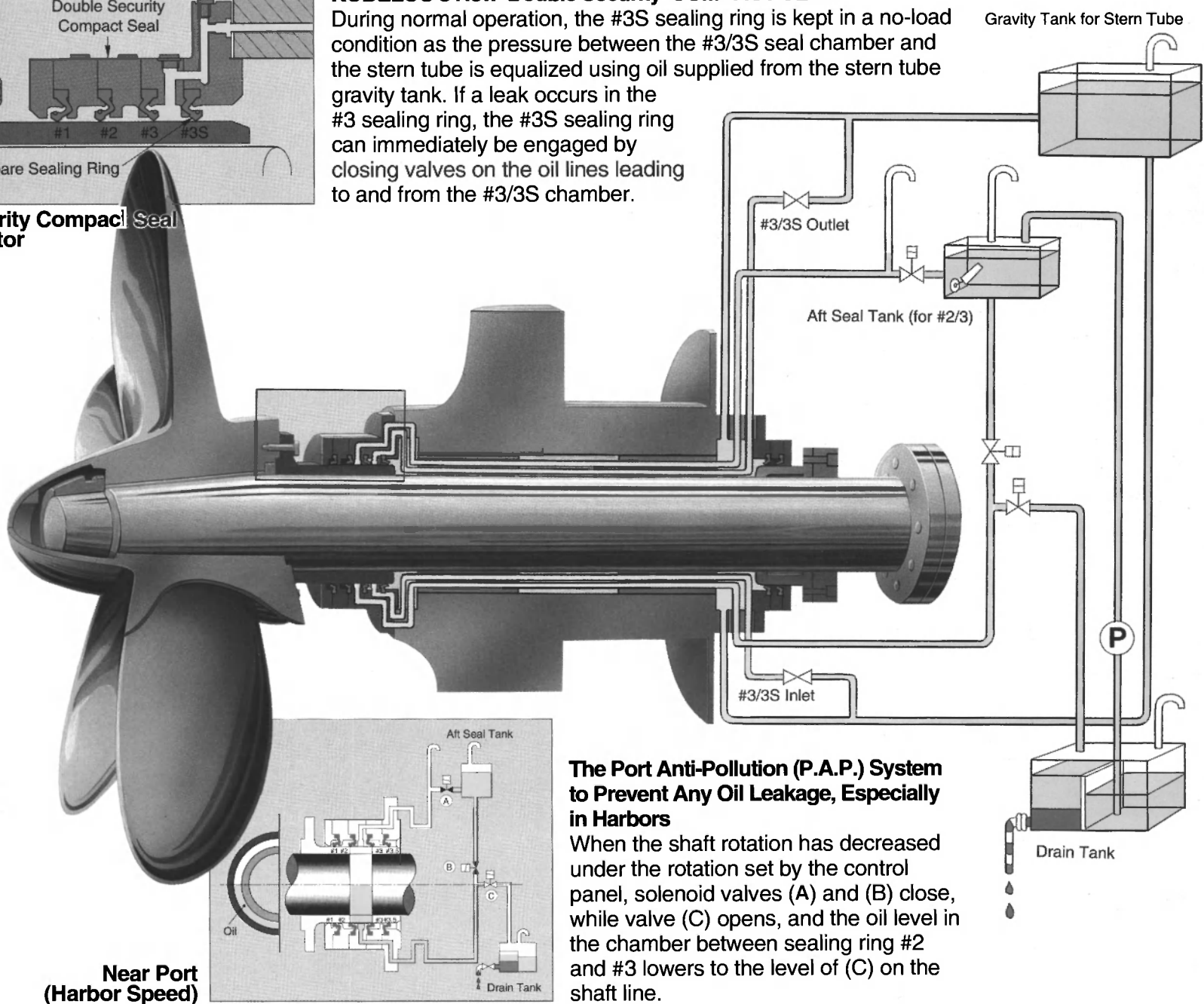
Double Security Compact Seal & Net Protector

KOBELCO's Net Protector

The Net Protector winds the nets or ropes between the protector and propeller blades, preventing them from passing through the clearance between the rope guard and propeller boss.

KOBELCO's New 'Double Security' COMPACT SEAL

During normal operation, the #3S sealing ring is kept in a no-load condition as the pressure between the #3/3S seal chamber and the stern tube is equalized using oil supplied from the stern tube gravity tank. If a leak occurs in the #3 sealing ring, the #3S sealing ring can immediately be engaged by closing valves on the oil lines leading to and from the #3/3S chamber.



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When the shaft rotation has decreased under the rotation set by the control panel, solenoid valves (A) and (B) close, while valve (C) opens, and the oil level in the chamber between sealing ring #2 and #3 lowers to the level of (C) on the shaft line.

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FISH EXPO '93 Exhibitor List (Continued)

Detroit Diesel Corporation
Drew Ameroid Marine
Dunlop-Beaufort Ltd.
Du Pont Co.
Duramax Marine/Johnson Rubber Co.
Elliot Inflatable Rafts
Emerson Power Products Inc.
Englund Marine Supply
RW Fernstrum & Company
Foss Shipyard
Freeman Marine Equipment Inc.
Fuel Technologies Inc.
Furuno USA Inc.
Glacier Steel Buildings Inc.
Glassmaster Company
Glastra Heating Inc.
Global Marine Canada/Universal Marine

Globe Marine Products
Hagglunds Inc.
Hellamarine
Horton Mfg. Co. Inc.
Houston Marine Training Services
Hull Electronics Co.
Hydra-Power Systems Inc.
Hydraulic Industries Inc.
Hydraulic Marine Equipment Co. Inc.
ICOM America Inc.
Inflatable Boatworks Inc.
ITT
Jastram Engineering Ltd.
Jensen Maritime Consultants
Johnson Pumps
Kahlenberg Brothers Co.
Karmoy Winch AS

Kobelt Manufacturing Co. Ltd.
Kockum Sonics Inc./Norselicht
Kolstrand Supply Company
Kvichak Marine Industries Inc.
Lindgren-Pitman Inc.
Lister-Petter Inc.
Litton Special Devices
Mackay Communications Inc.
Magellan Systems Corp.
Magnavox Electronic Systems Co.
MA Graphics Inc.
MAPCO
MARCO Seattle
Marine Matrix NW Inc.
Marine Sanitation
Marine Ship Supply
Marine Spill Response Corporation

Marine Travelift Inc.
Maritiem B V
Maritime Reporter & Engineering News
MarkAir, Inc.
Marland Enterprises Corporation
J.M. Martinac Shipbuilding Corp.
Mathers MMC Inc.
Julian A. McDermott Corp.
Measurement Systems International Inc.
Metric Marine & Industrial
Michigan Wheel Corporation
Microphor Inc.
M.I.T. International
Mobile Telesystems, Inc.
Mobil Oil Corp.
Morse Controls
Motorola Inc.
MP Pumps Inc.
Munson Manufacturing Inc.
Frank W. Murphy Mfr.
NAIAD Marine
Napier Co. (Arbroath) Ltd
Navico Inc.
N.C. Machinery Co.
Neptune Dynamics Ltd.
Neptune International Ltd.
Neptune Machinery Inc.
Net Systems Inc.
Newmar
Nichols Brothers Boat Builders Inc.
NMP Corp.
Nordic Machine & Manufacturing
Nordisk Transport & Spedition AS
North American Marine Jet Inc.
Northwest Propeller & Machine Works
Norwegian Trade Council
Offshore Marine Laboratories Inc.
Offshore Systems Inc.
Omniglow Corporation
Orkot Engineering Plastics Inc.
Pacific Chemical
Pacific Coast Marine Industries Inc.
Pacific Telecom Cable Inc.
Parker Merrick Co.
Guido Perla & Associates Inc.
Peterson Builders Inc.
Petro Marine Services
Pettit-Morry Co.
Plastic Supply Inc.
Polyform US
Portland Ship Yard
Pullmaster Winch Corporation
Pump Industries Inc.
PYI Inc.
Radar Marine Electronics Inc.
Raytheon Marine Company
Ritchie Navigation
Simrad Robertson Inc.
Rodgers & Associates
Rodriguez Boat Builders Inc.
Rozema Boat and Machine Works Inc.
Sabroe Refrigeration Inc.
Samson Ocean Systems
Savolite Inc.
Sea-Fab Inc.
Sea Recovery Corporation
Sea Technology Co.
Seattle Refrigeration & Mfg. Co. Inc.
Seward Ship's Drydock & Ships Chandlery
SGC Inc.
Shell Oil Company
SIAT srl.
Sigma Sales
Simrad Robertson Inc.
SI-TEX Marine Electronics Inc.
Skookum/RopeMaster-Ulven
Sparton Marine Products
Sperry Marine Inc.
Spurs Marine Manufacturing Inc.
Stam Supply Inc.
Standard Communications Corp.
SWF Machinery
Tacoma Diesel & Equipment Inc.
N.A. Taylor Co. Inc.
Teleglobe Marine Inc.
Trimble Navigation Ltd.
Twin Disc Inc.
Ulstein International A/S
Unimerco A/S
Unitor Ships Service Inc.
Viking Fender Company
Vilter Manufacturing Corp.
Henry Vogt Machine Co.
Volvo Penta North America Inc.
Fred Wahl Marine Construction
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Watermakers Inc.
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Westmar Services Inc.
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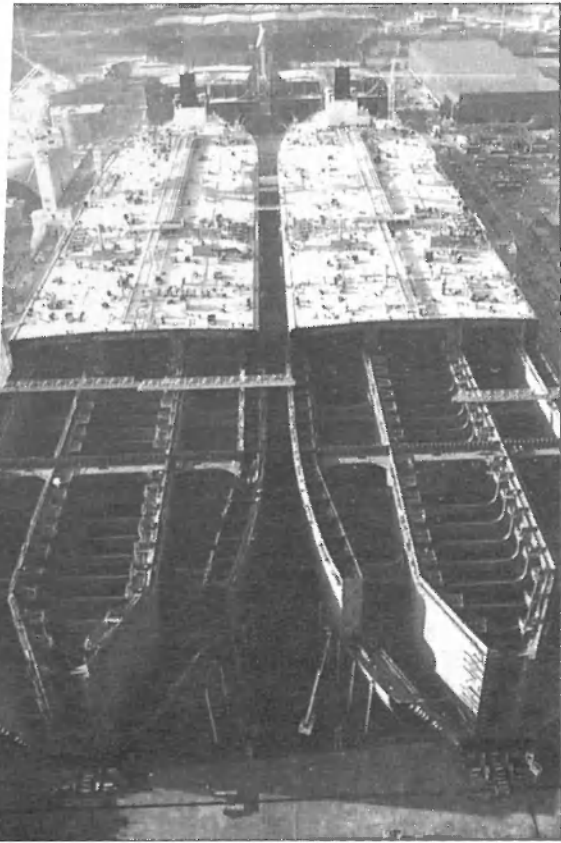


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Maritime Reporter/Engineering News

Daewoo Shipbuilding Sets World Record for Orders



Twin VLCCs under construction at Daewoo.

Daewoo Shipbuilding & Heavy Machinery Ltd. has reportedly set a world record for orders received during the first half of the year. As of the end of June, 1993, the company had received a total of 33 new orders totaling 2.25 million gt and worth approximately \$2 billion.

Highly significant is the fact that the orders included initial ones from a Japanese firm, Marubeni Corporation, for a 5,000-unit Ro/Ro ship, and for two drilling rigs from the China National Offshore Oil Company. The orders reflect Daewoo's efforts to diversify markets and globalize its shipbuilding efforts. The first order to any Korean firm this year, and the start of Daewoo's new record, was a \$150 million contract by the Indian State-run Oil and Natural Gas Commission (ONGC) for construction of an SHW Process Platform Complex.

Following on January 15th, the company announced an order from American President Lines (APL) of the U.S. for two 4,000-teu containerships worth \$170 million.

APL augmented this order with another order for two post-Panamax 4,800-teu containerships, the world's largest.

Between 1988 and the end of this year, Daewoo will have completed construction of 28 VLCCs.

The company has forged ahead in the international market as a specialist in the construction of double-hull VLCCs to meet increasing demands for environmental protection from oil spills.

Highlights at the shipyard this year included launching of twin 300,000-dwt VLCCs, the first ever in the world to be constructed simultaneously in the same dock. Daewoo has also negotiated a \$450 million contract from Iran for the construction of five new VLCCs and for two 280,000-dwt VLCCs from two Liberian firms.

Other orders received during the first half of the year included one for two pure car/truck carriers (PCTC) from the Swedish firm Wallenius Lines. Until now, Wallenius has ordered its PCTCs from Swedish and Japanese firms.

June orders included Westfal-Larsen & Co., Ltd. of Norway's order for two 46,000-dwt open-hatch bulk carriers, while NCC of Egypt, the national shipping company, contracted for two 70,000-dwt bulk carriers.

For more information on Daewoo,

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October, 1993

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The Navigation Instrument

Chart Viewer is the DGPS of the 90's. With 10ft accuracy, when supplied with its 6 channel differential receiver, the precision chart displays the positioning in latitude and longitude. This is only one of the many features of the Chart Viewer.

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33

Delavan Universal Level Switch Immune To Material Build-Up

Delavan Electronics' Cap Point 511 R.F. Capacitance point level control is widely used in liquid, slurries and powder bulk solids applications.

A unique feature with the Cap Point 511 is its ability to ignore material build-up, reportedly eliminating false signals.

Unlike many Capacitive or Admittance type devices, the Cap Point 511 requires no calibration under normal conditions.

The Cap Point 511 is available with several sensing element configurations to handle virtually any application. Several temperature and pressure ranges are available as well as integral and remote mounted electronics.

For more information on Delavan Electronics,

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Gasurveyor 400 Family Combines Instrumentation

The Gasurveyor 400 family of combustible gas indicators and confined space monitors reportedly combine many instruments into one, improving safety, locating leaks and reducing the cost of ownership.

Features include: CGI operation — LEL and percentage by volume gas; leak location operation — PPM hydrocarbon; confined space opera-

tion for O₂, CO, and H₂S; stack gas analyzer for spot testing of CO, O₂ and flammables; on-board interrupt pump; audio-visual alarms, probe filters for dust and water, and hardness; rugged, weather-proof construction; computerized calibration for pass-fail in four minutes; total computerized record-keeping; automatic datalogging with transfer. The model exceeds all OSHA requirements for confined space monitoring as well as leak location.

For more information on McNeil International's products,

Circle 29 on Reader Service Card

IMPORTANT EPIRB SERVICE BULLETIN

Internal changes of the knifeblade holder of the hydrostatic release mechanism manufactured by C.M. Hammar HandelsAB (HAMMAR) for the ACR Electronics, Inc. (ACR) RLB-23 Category I, 406 MHz EPIRB has affected the ability of the hydrostatic release to cut the ACR retaining rod. This cutting action enables the unit to be automatically released from the case when it is submerged.

ACR was only recently made aware of the design changes. ACR will issue a modified rod replacement kit to anyone who purchased the model RLB-23 Category I, 406 MHz EPIRB or a hydrostatic release and/or rod kit for the RLB-23, subsequent to August 31, 1992 when the design changes were implemented. Kits will be sent to any users who have registered their units with the National Oceanic and Atmospheric Administration, and to distributors who were shipped RLB-23 Category I, 406 MHz EPIRBs or hydrostatic release/rod kits after August 31, 1992. Detailed, easy-installation instructions are included with each kit.

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FAX: 703/548-2812

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Max Power's Thruster Is Fully Retractable

The hydraulic-powered Retractable is a retractable marine thruster for all kinds of yachts and power craft that stays hidden in the lower part of the hull and then folds out to perform even the most delicate maneuvers. Manufactured by the French company Max Power, the Retractable offers many advantages, including compact design, exceptional performance, reliability, and easy installation. It has already been well-received by naval architects, shipyards and others in the shipbuilding industry including companies such as Beneteau, Ifach, San Lorenzo, and Belliere. The unit is reportedly ideal for maneuvering into tight mooring places, fighting winds and currents, and moving at low speeds.

The Retractable is available in three lightweight models that occupy minimal space under the floorboards.

For more information on Max Power and the Retractable,

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FISHERMAN'S WHOLESALE MARINE SUPPLY CO., INC.

CompuNav SYSTEMS

KOBELT

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Hydrasearch Receives USN Approval For New Line

Hydrasearch Co., Inc. of Annapolis, Md. received U.S. Navy (USN) approval for a new line of internal support sleeves and coils. The sleeves consist of bronze rings encapsulated in Buna-N rubber bonding and are stacked inside collapsible hose assemblies to be used in vacuum service.

Sleeves can be cut to accommodate various hose assembly lengths and are currently available for hoses with inside diameters of five, six and eight inches.

The internal support coils are available in beryllium copper and stainless steel, and are inserted into collapsible hose assemblies to provide support in vacuum service. These coils are utilized with 2.5-inch through four-inch internal diameter hoses. Both accessory items are available for use with Hydrasearch marine hose and fittings manufactured to MIL-H-24135 & MIL-H-24136.

For more information on these Hydrasearch products,

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Maritime Reporter/Engineering News

Industry Leaders Meet To Discuss Maritime Policy, Commercialization

By Greg Trauthwein, managing editor

"There is going to be a huge shipbuilding boom in the world, and we (the U.S.) need to be a part of this boom," said **John Stocker**, president of the Shipbuilders Council of America. Mr. **Stocker** was a member of a group of industry leaders which met to discuss the issues and legislation, or lack thereof, which will shape the U.S. maritime industry for the duration of the decade.

Sponsored by the Containerization & Intermodal Institute, maritime leaders convened recently at the National Press Club in Washington, D.C. for a half-day conference entitled "U.S. Maritime Policy: The Last Chance To Get It Right." Cosponsored by the Virginia Port Authority and the Virginia International Terminals, the conference featured speakers from various facets of the industry, including government, owner/operators, military and building interests.

While Mr. **Stocker's** views, that the health of the U.S. shipbuilding industry is dependent on the ability to market the product to the international community, are shared by many, the views on what action is necessary vary wildly.

So naturally, the topics discussed during the afternoon were wide-ranging.

For example, **Cathleen Magennis**, Secretary of Commerce and Trade for the Commonwealth of Virginia, expressed concern over shrinking DOD funds, as "Virginia receives more Department of Defense funds per capita than any other

state." She cited many cures for the current maritime ills, including the proposed center for advanced shiprepair, which is up for consideration for DOD Advanced Research Projects Agency (ARPA) funding, and is a concept hatched between the State of Virginia, the city of Norfolk, Old Dominion University and the South Tidewater Association of Ship Repairers in the Hampton Roads area. The center would be used to study and recommend practices for the use of technology, to enable U.S. yards to increase cost effectiveness, as well as environmental compliance, she said.

Ms. **Magennis** said that the project would not only position builders to be more competitive commercially, it would also be the first step of an important journey, a journey to provide the U.S. maritime industry with a center for hydrodynamic research.

Meanwhile, an aide for Congressman **Herbert Bateman** (R-Va.) expressed concern about the administration's proposals to repeal cornerstone maritime legislation, including the Jones Act, and called for the passage of a bill which would allow Title XI loans for shipbuilding. Conversely, **Robert Quartel**, a former Federal Maritime commissioner, and now president of the U.S. Shipbuilding Consortium, believes less government involvement is the route to success. He contested that "the U.S. Coast Guard and subsidies are not the demise of commercial shipbuilding, they are excuses."

USCG, Associations Balk At Mandatory Documentation For Inland Waterways

The U.S. Coast Guard (USCG), American Waterways Operators (AWO) and the Passenger Vessel Association (PVA) told a House panel that proposed legislation which expands the requirement for merchant mariner documents to include personnel employed on tugs, towboats, and barges of five-gt and more, would not necessarily result in the desired ends of safety and pollution prevention.

The legislation, H.R. 1915, would require not only vessel-operating personnel to carry so-called Mer-

chant Mariner Documents, but, in the passenger vessel industry, would also require hotel personnel, entertainers, cooks and other to carry permits before they could work onboard inland-operated vessels.

"It is government regulation for no reason," said **Eric Scharf**, the PVA's executive director. "Its costly requirements respond to no identifiable public need, either on the part of the government or the industries upon which it is imposed."

In real terms, H.R. 1915 would require the USCG to document an additional 30,000 workers annually, at an estimated cost of \$500,000. It will also require the hiring of 13 more employees to administer the proposed documentation requirements.

Mr. **Scharf** sharply criticized the cost of the bill, to private industry and to the government. According to industry observers, the passenger vessel industry alone would require 3,000 to 5,000 additional cards at a minimum processing cost of \$52 per card.

National Performance Calls For The Formation Of Maritime Commission

Based on early drafts of Vice President **Gore's** National Performance Review (NPR), many in the maritime industry were concerned the report would suggest the elimination of such industry staples as the Jones Act and the Passenger Service Act.

However, after its release on September 7, the recommendations for the maritime industry is a suggestion to establish an independent commission to review the U.S. maritime industry with a detailed examination of the future of the industry in the U.S. and the benefits derived by the taxpayers from maritime subsidies.

The report from vice president **Gore** also recommends guaranteed reemployment rights to U.S. seafarers at their private sector jobs if called to serve during war or national emergency, and a 50 percent cut in federal funding for the U.S. Merchant Marine Academy. At press time the House Merchant Marine Subcommittee on Merchant Marine is scheduled to mark up draft legislation to create the National Commission to Ensure a Strong and Competitive U.S. Maritime Industry.

Maritime Administration News

Adm. Herberger Sworn In As Maritime Administrator

On September 14 Adm. **Albert J. Herberger** was formally sworn in as Administrator of the Maritime Administration by Secretary of Transportation **Federico Pena**. A graduate of the U.S. Merchant Marine Academy, Adm. **Herberger** served in the American merchant marine early in his career and in the U.S. Navy for 32 years.

• Parker Towing Co. Applies For Financing

MarAd has received an application from Parker Towing Company, Inc. of Tuscaloosa, Ala. for a ship financing guarantee to aid in refinancing the Title XI guaranteed debt on 90 existing vessels which includes 83 barges and seven tugs. The vessels, which operate in the U.S. inland waterway system, were delivered between 1973 and 1982. If approved, the Title XI guarantee would cover \$9.4 million.

• Oglebay Norton Applies For Title Ship Financing

MarAd has received an application from Oglebay Norton Co. of Cleveland for a Title ship financing guarantee to aid in refinancing the Title XI guaranteed debt on the Columbia Star, a Great Lakes diesel, self-propelled bulk cargo vessel. The vessel was built by Bay Ship-

building Corp. of Sturgeon Bay, Wis., and if approved, the Title XI guarantee would cover \$18.75 million.

• APL Granted Permission To Operate Feeder

MarAd has given American President Lines, Ltd. permission to operate a second foreign-flag feeder vessel between Singapore and Indonesia. Under the approval, APL may add a vessel with a capacity of 300 40-foot containers, or equivalent, to its service.

• Bethlehem Steel Wins \$1.9 Million Contract

MarAd awarded a \$1.9 million contract to Bethlehem Steel's Sparrows Point, Md. facility for topside repairs to the Ready Reserve Force vessel GTS Admiral Callaghan, including voyage repairs and hatch cover upgrades. The work will include repairs to the tank and cargo holds, the main weather deck, hatch cover modifications, vehicle ramp repairs and installation of a marine sewage treatment plant.

• Eastern Overseas Requests Permission To Sell Tanker

MarAd has received an application from Eastern Overseas, Inc. of Port Washington, N.Y. for permission to sell the 41,993-dwt tanker

(Continued on page 36)

LEGISLATION UPDATE

(Continued from page 35)

MarAd News (continued)

"Star of Oregon" to Crosseas Shipping Ltd., of Leicester, England. The vessel, which was built in Newport News, Va. in 1953, would be resold to Baldev Ship Breakers of Shastringer, Bhavnagar India for scrapping in that country.

• MarAd Issues Invitation For Bids For Scrapping Of Vessels

MarAd has issued an invitation for bids no. EXC-8629 offering 12 obsolete vessels for scrapping within the U.S. or approved foreign countries. They are located at national Defense Reserve Fleet sites in James River, Va. and Suisun Bay, Calif.

The four vessels located at James River RF are: Elko Victory; Selma Victory; Wayne Victory; and Madison Jordan Manchester. The eight vessels located at Suisun Bay RF are: Bucknell Victory; Central Victory; Council Bluffs Victory; Lahaina Victory; Las Vegas Victory; Lindenwood Victory; Loyola Victory; and Massilon Victory. They are being sold "as is, where is," and bids must be received by 2:30 p.m. on October 15 by the Maritime Administration (Code 745.1), U.S. Dept. of Transportation, 400 Seventh St., S.W., Room 4342, Washington, D.C. 20590.

• OMI Asks To Sell Tanker

MarAd received an application from OMI Corp. of New York for permission to sell the 37,583-dwt tanker OMI Wabash to Vijay Ship Breaking Corp, Gujarat, India, for scrapping in that country. The vessel was built in Brooklyn, N.Y. in 1969.

• Marine Hydraulics Wins \$2.8 Million MarAd Contract

MarAd awarded a \$2.8 million contract to Marine Hydraulics Intl. Inc. of Norfolk, Va. for prepositioning upgrades for the Ready Reserve Force vessels M/V Cape Hudson and M/V Cape Horn. The work on both vessels will involve prepositioning upgrades and repairs including tank and cargo hold repairs, modifications to the decontamination station and work on air conditioning and dehumidification systems. The Cape Horn will also be drydocked and its stern ramp repaired. The work is expected to be completed within 60 calendar days.

• MarAd Approves Global Marine Nautilus Request

MarAd has approved a request from Global Marine Nautilus, Inc. for permission to sell the 6,264-gt drilling vessel Glomar Moray Firth I to Transocean Drilling. The vessel will be used in offshore drilling op-

erations in the U.K. sector of the North Sea.

• Southern Holdings Seeks MarAd's Permission To Sell

MarAd also received a request from Southern Holdings, Inc. of New Orleans for permission to sell and

transfer to registry in the Cayman Islands the drill barge Mr. T.M. to Cad-Drill. The proposed purchaser is North Africa, Ltd., c/o Caledonian Bank & Trust Ltd., Georgetown, Grand Cayman. The vessel was built in 1977 in New Iberia, La., and will be used in oil drilling. MarAd's permission is required by section 9 of the Shipping Act of 1916.

Fiscal Year 1994 Legislative Items

ITEM	HOUSE	SENATE	STATUS
Anti-Subsidy Bills	H.R. 1402, The Shipbuilding Trade Reform Act of 1993, to provide remedies against foreign shipbuilding and repair subsidies (Ways & Means Trade Subcommittee)	S. 990, Senate version excludes anti-dumping/countervailing duty provisions (Merchant Marine Subcommittee)	Hearing already on 1402
Sealift	H.R. 2401, FY 1994 Defense Authorization House Armed Services Committee (HASC): Adds \$290 Million in FY 1994 funds for the National Defense Sealift Fund (NDSF)	S. 1298, FY 1994 Defense Authorization, Senate Armed Services Committee (SASC): Creates Natl. Def. Strategic Lift Fund: Total budget \$2.7 billion	Floor votes taking place at press time
Foreign Repairs Of Navy Ships	H.R. 2401 HASC: Restricts foreign maintenance of Navy ships, prohibits depot-level work on U.S. Navy ships by foreign yards; restricts govt. charter of vessels re-flagged/converted in foreign yards	Not addressed by SASC	Floor vote taking place at press time SCA supports HASC items
Public/Private Navy Ship Maintenance	H.R. 2401 HASC: Requires formation of commission to examine public vs. private maintenance; requires calculation of 60% floor for public yard to be made for each ship class; restricts 60% floor to five years after delivery; allows govt. yards to compete for non-govt. work	Not addressed by SASC	Floor vote taking place at press time
National Shipbuilding Initiative	H.R. 2401 HASC: provides expanded Title XI loan guarantees; (1) \$175 million for U.S. built ships, domestic and export, (2) \$25 million for yard modernization; incorporates \$100 million defense conversion funds for ship design/production R&D	Not addressed by SASC	Floor vote taking place at press time
Govt. Ship Chartering	H.R. 2401 HASC: Authorizes five-year charters for DoD double-hulled tankers and oceanographic vessels	Not addressed by SASC	Floor vote taking place at press time
Defense Export Guarantees	Not addressed	S. 1298 SASC: Authorizes \$25 million for \$1 billion defense export loans	Floor vote taking place at press time
National Shipbuilding & Conversion Act	H.R. 2547: HASC/Merchant Marine & Fisheries: loan guarantees/R&D items put in H.R. 2401; extends charter period of DoD double-hull tanker to 10 years; provides series construction payments for U.S. yards to convert to commercial shipbuilding	No action in Senate	Items included in other House bills SCA strongly supports items, regardless of vehicle
Series Transition Payments	H.R. 2151 MM&F Committee: Creates a program of payments for series-built ship construction to subsidize the transition of U.S. yards from the defense market to the commercial market	No action in Senate	Item in U.S.-flag subsidy bill. No funding source identified

SOURCE: Shipbuilders Council of America

SAFETY AT SEA

A Partnership In Maritime Evolution

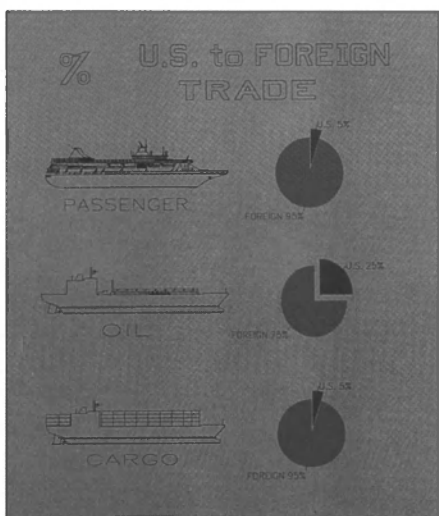
by RAdm. A. E. Henn, USCG

A number of tragic casualties have occurred in the past several years which have caused the U.S. Coast Guard (USCG) to go to general quarters.

• A Need For Improvement Of Maritime Safety

The time has come to assign responsibilities to those who are charged with maritime safety and environmental protection; time for each of us to critically examine our roles, and if need be, to alter those roles and the way we do business. The USCG is working with owners, classification societies, other governments, insurers and the entire maritime community as a team, in a partnership to continually strive for a safe and clean marine environment. The U.S. is now predominantly a port state (see Figure 1).

Figure 1



Approximately 95 percent of our passenger cruise trade, 95 percent of our cargo imports and 75 percent of our crude oil pumped ashore involve foreign flag vessels. Thousands of vessels, flying the flags of over 55 other governments, regularly call at our ports every year. As a port state, we are obligated to protect our citizens and their environment.

Picture the protection of life and property at sea, and the protection of the marine environment, as a layered series of safety nets stretched out below the entire maritime industry. These safety nets—which include owners/operators, classification societies, the flag state, and the port state—represent the segments of our community charged with carrying out specific responsibilities. These safety nets have been created to keep a ship, its passengers and crew, and its cargo out of harm's way.

• Owner/Operators

The first and most important

safety net is that of the vessel's owners and operators. Even the most technologically-advanced vessel will quickly deteriorate and become a maritime menace if it is not adequately maintained, crewed and managed. Thus, we have come to recognize that a company's management practices, its maintenance philosophy, and its institutional commitment to maritime safety and environmental protection are among the most significant parts of the equation.

The International Maritime Organization's (IMO) Marine Safety Committee (MSC) has taken note of the importance of the maritime community's infrastructure. The Committee's International Management Code for the Safe Operation of Ships and for Pollution Prevention (International Safety Management (ISM) Code) provides a series of recommendations for the "appropriate organization of management to enable it to respond to the need of those on board ship to achieve and maintain high standards of safety and environmental protection." The ISM Code identifies the functional requirements of a company's Safety Management System, which includes: procedures for maintaining the vessel in accordance with relevant international and flag state requirements; procedures for reporting non-conformities; and procedures to prepare for and respond to emergency situations. I expect the ISM Code to be adopted as a resolution by the IMO's Assembly in late October 1993.

I endorse the aims of the ISM Code, and have incorporated many of its objectives in our own Maritime Regulatory Reform agenda. In fact, much of the ISM Code merely codifies the operations and philosophies which have been practiced by responsible marine operators for years; the companies for whom safety has always been "smart business." In short, the ISM Code reaffirms that vessel owners/operators bear the ultimate responsibility to crew, maintain and safely operate seaworthy vessels. Thus, when owner/operators meet their responsibilities, the remaining safety nets take on an enhancement role rather than an enforcement role.

• Classification Societies

The second safety net is the classification societies. They work with underwriters, and act as the owner's backup for maintaining a seaworthy ship. They are also responsible to the owner for ensuring the ship complies with the requirements of their own classification rules. There are 42 classification societies around the world today, and of these, only 11 are recognized in the Interna-

tional Association of Classification Societies. Even within the 11 recognized classification societies, there are the big eight, and probably only five or so that most of us are comfortable with. Well, what of the other 31 so-called classification societies? The ones I refer to as the "tinker-toy" classification societies. The ones that consist of two men and a dog in a room with a telephone; classification societies that would "stamp a ham sandwich" if they could make a dollar doing so. The international community is so concerned about the proliferation of these "in name only" classification societies that a new subcommittee on Flag State Implementation has been formed by the IMO.

• Flag State

The third safety net is the flag state's administration. Since shipping involves the public market place, government control is enacted through laws and regulations that promulgate a level of safety in accordance with public expectations. Administrations are responsible for ensuring that the provisions of such laws and regulations are met. In this regard, the IMO embodies the international public's expectations and each flag administration is charged with enforcing the provisions of the IMO conventions. The USCG acts as the flag state administrator for vessels flying the U.S. flag. I am pleased to see the new IMO Flag State Implementation Subcommittee establishing guidelines for delegation of authority by a Flag State to a body acting on its behalf, and guidelines to assist flag states in the implementation of IMO instruments relating to the reduction of substandard ships. I believe international cooperation like this is critical, as there are far too many flag state administrations shirking their responsibilities.

• Port States

The fourth safety net is the port state. As protection to its own citizens and their environment, each port state is authorized to verify that the provisions of the conventions are met. The extent and depth of the examinations performed varies greatly with each country. The port state safety net should only have to review the condition of a ship. Its role is to verify, not certify.

However, I must tell you the



RAdm. A. E. Henn

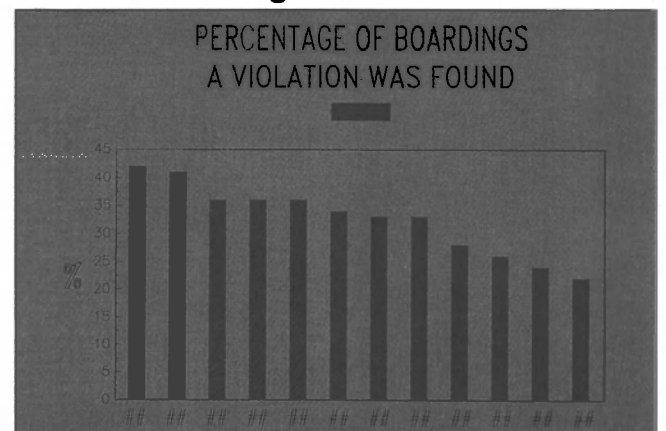
U.S. control verification program continues to find too many deficient vessels that have passed through the first four safety nets undetected.

The U.S. sees a large cross section of the shipping industry. For example, last year 7,500 foreign flag vessels made 60,000 port calls to U.S. ports. Under our control verification program, the USCG conducted 13,000 separate boardings and boarded 6,600 foreign flag vessels. The USCG found violations of U.S. laws or international regulations on 36 percent of the boardings. Cargo transfer or vessel movement controls were imposed during 12 percent of the boardings. And in 300 cases, about two percent of our boardings, the foreign vessel was detained pending correction of the violation.

Looking a bit closer at foreign flag tank ships, 1,600 foreign flag tank ships entered U.S. ports last year. These vessels accounted for more than 12,000 port calls. Our examination of these vessels found numerous violations of SOLAS and USCG

(Continued on page 39)

Figure 2



SAFETY AT SEA

A New Balance Between Pollution Prevention And Mitigation

by Captain Okkie Grapow, president,
International Salvage Union

Perhaps the prizes for the most thankless job in the world should go to the people in charge of clean-up operations following a major oil spill. As experts, they will be only too painfully aware of the severe limitations of today's clean-up technology. They will know that oil recovery rates of less than 10 percent are the norm. Yet they will be surrounded by people with totally unrealistic expectations of what can and should be achieved.

With this in mind, one can be forgiven for asking why the Oil Pollution Act of 1990 (OPA 90) directed virtually all available resources towards mitigation measures post-spill, rather than preventive measures which aim to stop spills from happening in the first place.

The huge funds made available for clean-up were allocated without cost-benefit analysis of more promising preventive strategies. If this analysis had been done, a proportion of the funds almost certainly would have been channeled into salvage, the first line of defense against pollution.

The weakness of OPA 90 needs to be put into perspective. During 1989 to 1992, International Salvage Union member salvors attended 40 casualties involving actual or threatened pollution on a major scale. The main technique adopted was ship-to-ship transfer of cargo, following the salvage team's initial action to extinguish fires, pump out flooded spaces and make emergency repairs. Without the salvor's intervention, large spills would have resulted and clean-up teams (even those well-equipped and resourced) would have probably picked up 10 percent at best.

It is easy to understand the general reluctance to face up to the disappointing realities of clean-up. Salvage, meanwhile, is not the only preventive option. Other actions on this front include: the introduction of Total Quality Management systems; Enhanced Survey; and tougher port state control. However, all other options have a serious flaw: they will take years to deliver their benefits. The shipping industry can't afford to wait for such improvements. In the 1980s, the numbers of serious shipping accidents fell. But the trend moved into reverse over the past three years. The tanker owner faces an ever-present risk, albeit slight, of involvement in a spill of catastrophic proportions.

There is an acute need for measures which promise to be effective in the short-term initiatives which can deliver an immediate and dramatic reduction of operational risk.



Captain Okkie Grapow



Tugs fight the gasoline fire onboard the British Trent, which was involved in a collision off the Belgian coast in June.

Salvage is a viable short-term route to significant risk reduction, as salvors often transform a potential pollution disaster into a successful salvage. However, new initiatives are needed if an appropriate level of salvage-based protection is to continue to be available, at round-the-clock readiness, to defend heavily trafficked areas and vulnerable shorelines.

Those responsible for drafting OPA 90 may have overlooked the importance of salvage due to the simple fact that the salvor's success is invisible. Fortunately, however, the U.S. authorities now embrace the ISU's first principle, which is "keep the pollutant in the ship." The logic behind this approach has prompted a major survey of salvage resources in U.S. waters. The National Response Corp., working with the U.S. Coast Guard (USCG) and the U.S. Navy (USN), is in the process of reassessing national salvage posture, with particular emphasis on the role of salvors in emergency response and pollution defense.

Major operations carried out over the past year underlined the effectiveness of timely salvage response and cargo recovery via ship-to-ship transfer. These cases included two major emergencies within the space of four months in the Malacca Straits.

In September of last year, the Liberian tanker Nagasaki Spirit and the containership Ocean Blessing collided in the northern approaches to the Straits. The 96,000-dwt Nagasaki Spirit suffered severe structural damage and lost approximately 12,000 tons of crude oil. There was also a severe loss of life. Huge fires resulted, but were eventually overcome by salvors. Later, the bulk of Nagasaki Spirit's cargo was transferred to another vessel.

In January this year, the 270,000-dwt Maersk Navigator and the smaller tanker Sanko Honour collided in the same area. The first salvage vessel to arrive at the scene found the Maersk Navigator a mass of smoke and flames.

After many days of close-quarters firefighting, the salvors extinguished the fire and safely transferred around 90 percent of Maersk Navigator's 250,000-tons of Omani crude to another vessel.

Over the past 15 years, ISU salvors performed more than 2,400 salvage operations; several hundred involving laden tankers. If salvors are to continue to provide essential pollution prevention services, there needs to be a better balance between prevention and mitigation, and an appropriate reallocation of resources.

• Fleet Age & Human Error

Three P&I studies over the past two years have confirmed that 60 to 80 percent of all shipping accidents result from human error (see related story page 44).

Meanwhile, freight rates remain too low to trigger newbuilding programs on a scale extensive enough to produce a younger world fleet.

The human error and age factors brought Tecnitas, the Bureau Veritas consultancy which carried out the first-ever International Salvage Survey in 1992, to the alarming conclusion that an additional 100 serious shipping casualties a year can be expected by 1996.

This belief, that the improvement in maritime safety visible in the 1980s has moved into reverse during the 1990s, has touched a raw nerve in many administrations. In the U.K., for example, the loss of the Braer in early 1993 resulted in a Department of Transportation-commissioned study of emergency towing and salvage resources available to protect the British coastline.

In February, a joint industry body, the Salvage Working Group, published a report calling for greater industry collaboration with governmental and intergovernmental agencies on salvage-related issues, including pollution defense.

Within days of the loss of the Braer, EC Environment and Transport Ministers gathered to consider the scope for new initiatives to improve maritime safety and pollution prevention. A few weeks later, the European Commission adopted a "Common Policy on Safe Seas." This calls for new measures in the areas of emergency response and salvage cover. Meanwhile, the International Maritime Organization declared the improvement of salvage services a high priority task under resolution 8 of the Oil Pollution Preparedness, Response and Cooperation Convention. The IMO work will build on the Salvage Working Group's recommendations.

The industry is also stirring following publication of the Salvage Working Group report. A successor body, the Salvage Liaison Group, met for the first time in May. Already, the ISU and BIMCO have agreed on new model contracts for wet salvage services, thus fulfilling one of the Salvage

ISU: A New Balance

Working Group's recommendations.
New Priorities For The 1990s

Tonnage lost in the three years 1990, 1991 and 1992 exceeded the figures recorded in the late 1980s. In 1992, the number of "no cure-no pay" salvage operations performed by ISU salvors increased by 10 percent, to 202.

Looking ahead, the new initiatives to help ensure salvors continue to "keep the pollutant in the ship" should include:

- Methodical assessment, region by region, of salvage needs in relation to traffic density, accident record and environmental sensitivity;

- The development of realistic criteria for identifying a cost-effective balance between spill prevention and mitigation;

- New programs to put salvors' expertise to work in the field of education and training. The first hour of a marine emergency is crucial. One useful initiative here might involve special courses for ships' crews which focus on "emergency first aid" action to be taken in the period before professional salvage help arrives.

There are also, of course, the questions arising from the public interest dimension of salvage. Should market forces alone be permitted to govern the distribution of precious salvage resources?

There is a growing view that free market benefits need to be balanced against the need for emergency cover in those areas which might be left unprotected without some degree of state intervention or participation.

Whilst recognizing the public interest dimension, we believe that state intervention, where necessary, should be modeled on existing schemes under which private salvors and governments cooperate to provide pollution defense cover.

The ISU is an organization of private companies working in a highly-competitive market.

(Continued from page 37)

USCG: A Partnership In Maritime Evolution

regulations. What I am talking about here was not weather damage. Tank ships were found with holes in the main deck plate due to wastage, weather deck vents and hatches missing or damaged, and cargo tanks, cargo piping and cargo venting systems in need of permanent repairs.

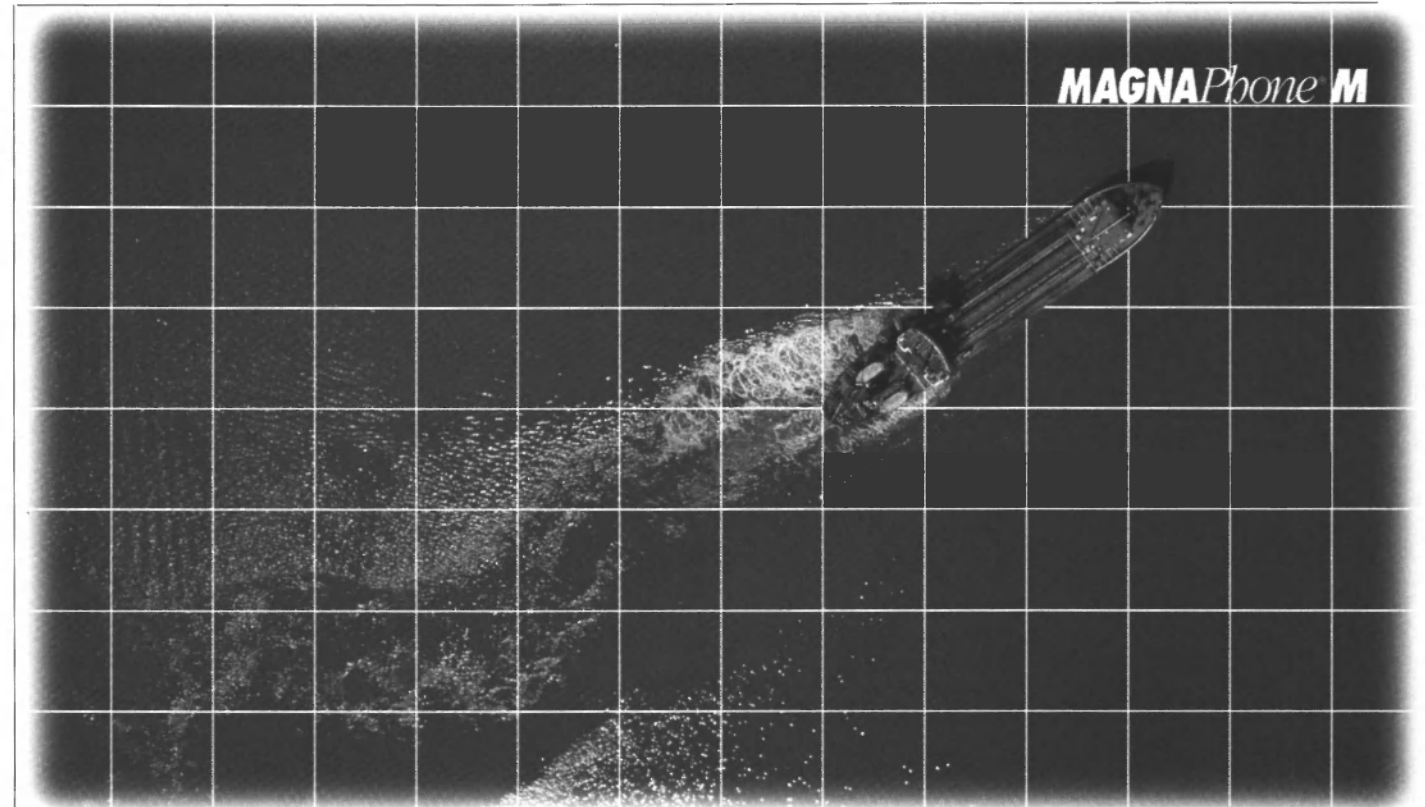
See Figure 2 (on page 37) to see how 12 flag states with large fleets have matched up in the past. Each of the bars represents a flag, and from now on the bad guys will be posted. The percentage of boardings

at which violations were found does not account for the times a USCG inspector boarded the vessel and the violation, such as an inoperative fire pump or a leaking containment bin, was repaired during the inspection or before the vessel departed. Even so, the average number of boardings during which a violation was found is more than 30 percent. These violations represent poor company management, and a disregard

for the safety of the ship, its crew and the environment.

The USCG is tired of being one of the only policemen for worldwide maritime safety and environmental protection. We believe that there are others within the maritime community who should share these responsibilities. The accomplishments of the IMO Flag State Implementation Subcommittee is just one important piece of the "revolution" tak-

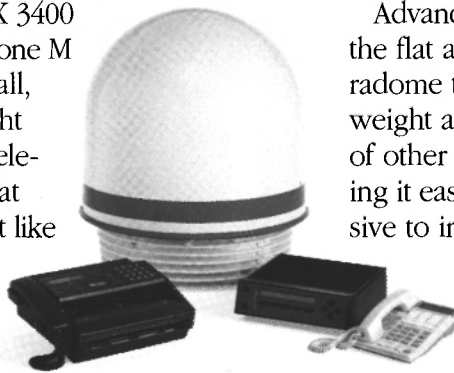
ing place in the international maritime community. Port states can no longer allow owners, operators, classification societies and flag states to ignore substandard ships. The USCG will continue our increased level of inspections on all foreign ships that call at U.S. ports. The time of the substandard operators, running substandard ships, classed by substandard classification societies, is coming to an end.



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Skanti Offers Full Range Of GMDSS Equipment

Skanti, a Danish company established in 1965, offers a full line of GMDSS equipment designed for easy operation.

The company backs all of its products—which include the Skanti PC 9000 personal computer, designed for the marine environment and compliant with the GMDSS speci-

cations; and the TP2 EPIRB, for COSPAS-SARSAT satellite search and rescue system—with a worldwide service network.

Skanti exports 95 percent of its production and is reportedly the largest manufacturer of HF-SSB Marine Radiotelephones in Europe.

For additional information on Skanti, and the company's full line of products,

Circle 16 on Reader Service Card

Jotron Supplies GMDSS Emergency And Onboard Communication Equipment

With its 30 years of experience as a leader in the latest technology of reliable maritime life-saving equipment, Jotron Electronics A.S. sports a full line of communications equipment backed with a network of trained agents worldwide for ser-

vice and support.

One of its many products, the Tron VHF is designed in compliance with the GMDSS. It is a six-channel transceiver which is water- and oil-resistant for five minutes at a one-meter depth.

For additional information,

Circle 23 on Reader Service Card

USCG Releases Manual On Fatigue Avoidance

The U.S. Coast Guard released a report which synthesizes the state-of-the-art in fatigue technology as it relates to the marine field. The book includes in-depth presentations of the methods used in modeling the loads from wind and waves, linear system response to random excitation, stress concentration factors, vortex shedding and fatigue damage calculation. For a copy of the new book, contact: Ship Structure Committee, U.S. Coast Guard (G-MI/R), 2100 Second St., S.W., Washington, D.C. 20593-0001; tel: (202) 267-0003; fax: (202) 267-4677

Motorola's LGT 1000™ GPS Terminal Doubles As DGPS

The LGT 1000™, Motorola's handheld global positioning system/geographic information systems (GPS/GIS) terminal functions as both a traditional differential GPS reference station, and a field data collector. Differential GPS (DGPS) enables users to achieve vast improvements in accuracy over standard GPS. In addition, the LGT 1000's customized attribute collection capabilities make it ideal for inventory management applications. For more information on the LGT 1000 from Motorola,

Circle 17 on Reader Service Card

Zodiac Adds Cabin To Rescue Boat, New Models

New for 1993 from Zodiac is a cabin model 733 patrol and rescue boat and two new models of life rafts for USCG approval. The Zodiac Hurricane 733 outboard model rescue and patrol boat has been popular as a high-speed response craft with many services, and is now available with a cabin, which provides protection yet does not affect the boat's performance. The Zodiac Hurricane 733 is 24-foot and capable of carrying 18 people. For more information on Zodiac,

Circle 84 on Reader Service Card

Unitor's Unifog: Signals New Generation Of Fire Fighting

Unitor's new waterfog fire fighting system for ships, Unifog, utilizes both new and existing technology to take shipboard fire protection into the 21st Century. Developed jointly by Norway's Unitor and Germany's



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ST for short.

Combined with higher performance transmitters and receivers, and the latest raster displays, ST provides performance levels never before available. Now, with PATHFINDER/ST, your vessels—and their crews—can have an important extra measure of safety and efficiency, including a

unique Safety-Coded CPA Circle, which shows course selections for safest CPAs. PATHFINDER/ST is available as an ARPA or a True Motion/Relative Motion display with Electronic Plotting. These displays can easily retrofit the displays in older Raytheon Bright Display Radar Systems, and can be high-performance repeaters for radars of most other manufacturers.

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

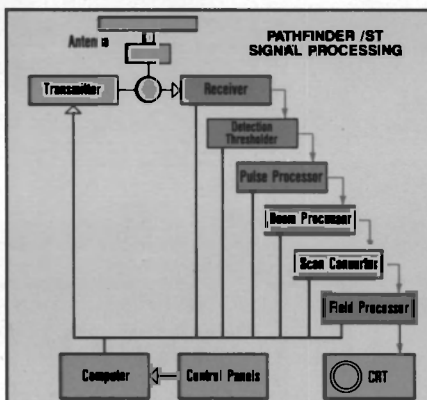
In side-by-side comparison tests, a PATHFINDER/ST display and a conventional radar display were connected to the same radar system. *PATHFINDER/ST consistently displayed targets not detected by the conventional display.*

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Simple Installation and Flexible System Configuration.

PATHFINDER/ST Radars satisfy a very wide range of installation and operating requirements. Signal multiplexing reduces connections between PATHFINDER/ST receivers and displays. This, combined with electronic interswitching for dual systems, the ability to mount transceivers "up" in antenna pedestals, or "down" in separate cabinets, and keyboard entry of all set-up parameters, makes any installation straightforward, simple, and economical. In addition to having the optional IMO-required, antenna-mounted performance monitors, PATHFINDER/ST Radar software provides menus for extensive self-testing of virtually every function.

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Specifications subject to change without notice.

Circle 246 on Reader Service Card

Maritime Reporter/Engineering News

Technisch Bureau Steur GmbH, Unifog is ideal for all areas of a vessel. A typical Unifog system includes a pump station, water supply break tanks, direction valves, distribution pipes, waterfog nozzles, programmable logic control and an addressable fire alarm system. For more from Unitor,

Circle 24 on Reader Service Card

New Evacuation Chute Receives Acclaim

Dunlop-Beaufort Canada, Ltd. (DBC), manufacturer, distributor and service facility for SOLAS and other approved Beaufort inflatable liferafts, recently announced the North American product launch of its Marine Evacuation Chute (MEC). The system was developed specifically for quick evacuation of large numbers of passenger off-sea vessels. The chutes have been installed on six new Canadian-built ferries, including the two new British Columbia Super Ferrries. The MEC is specified on several new American vessels to be built in 1993 and 1994.

Each MEC installation weighs less than one ton and occupies six square meters of deck space. Life rafts can be stowed in racks above head height.

For more information on the MEC from the company,

Circle 19 on Reader Service Card

REL, Inc. Offers SpilCAT Products

Reduced Environmental Liability, Inc. (REL) is a New Jersey-based company which distributes SpilCAT products. SpilCAT takes its name from the abbreviation C.A.T.—Capillary Absorbent Technology. SpilCAT is a non-hazardous, non-toxic, biodegradable, hydrophobic, non-flammable product which absorbs 60 times its weight in target liquid. REL, Inc. supplies users with SpilCAT configured products (particulate, mats, booms, spill kits, etc.) to address OPA 90 on-deck response, engine room and on-water clean up. For more information on SpilCAT from REL, Inc.,

Circle 21 on Reader Service Card

New Line of VHF Radios Meet GMDSS Specs

Navico has introduced AXIS, a line of submersible hand-held VHF radios. Designed to meet rigorous GMDSS specifications, AXIS radios are built to deliver reliable VHF communications in conditions which render regular hand-held VHF radios inoperative. Five models of AXIS, including two fully-approved GMDSS models, are available. For more information on Navico's line,

Circle 22 on Reader Service Card

Marioff Offers Hi-Fog Fire Extinguishing System

Hi-fog is an innovative fire protection technology using small amounts of fresh water at high pressure. It was developed as a lightweight alternative to conventional sprinkler systems on passenger ships. A typical Hi-fog system weight is reportedly less than 10 percent of other systems, and Hi-fog also uses only a few percent of the water to provide equivalent fire protection level. The design of the Hi-fog sprinkler heads, combined with the high pressure, ensure that the small water droplets are propelled at high speed to penetrate the hot flue gases and fill the entire room. Independently witnessed fire tests have proven the fire suppression and control capabilities of the Hi-fog sprinkler system at SP, the Swedish National Testing Institute. More than 200 tests have included: cabin/corridor fire tests; simulated arsonist fire tests; ultra-fast response tests; ISO 6182 fire tests; cabin "flash-over" fires; cable duct fire tests; and 60-sq.-meters room and open space fire tests. For more information,

Circle 20 on Reader Service Card

ANZDL Implements Hazardous Cargo Program

Australia-New Zealand Direct Line (ANZDL) announced the imple-

mentation of a comprehensive hazardous cargo program designed to meet shipper's needs. The program, known as "ANZSAFE," is a multifaceted undertaking which assists shippers with every step of hazardous cargo transportation. These steps include the completion of the hazardous declaration forms, understanding regulations and special handling systems and providing vital guidance in the event of an emergency situation.

New Company Offers Pollution Prevention

Tankontrol AS, a new company specializing in the development, manufacture and supply of equipment for tankers and terminals, has introduced Scupperwell, a new deck oil spill pollution prevention device.

Type approved by Det Norske Veritas for installation on ships and mobile offshore units, Scupperwell has no moving parts and requires no power. It is designed to retain oil spilled on deck, which may occur during cargo or fuel transfer operations. Its manufacturer claims the new product will not only make a vessel more environmentally sound, but also help avoid monetary penalties for even slight oil spills.

For additional information on this new product from Tankontrol,

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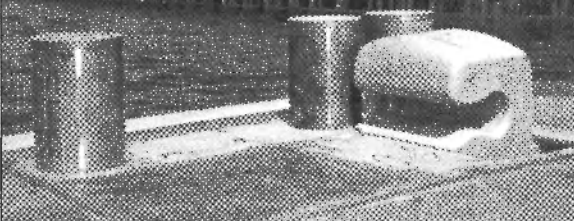
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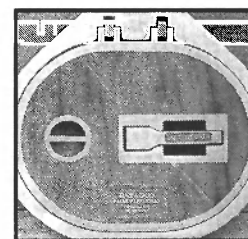


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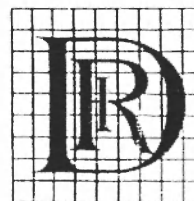
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SAFETY AT SEA

Germanischer Lloyd: R&D Helps Pave The Way For Safety

by Stephen Gumpel, principal surveyor,
North America, Germanischer Lloyd

Since its foundation in March 1867, the prime purpose of Germanischer Lloyd (GL) has been a professional dedication to the highest standards of safety at sea. In the early 1970s that aim was enhanced by GL's working arrangement with the German ministry for research and technology. This relationship has provided us with a research and scientific base in ship technology which we have been able to use to enhance safety at sea in many ways.

The arrangement began as a joint venture between the shipbuilders, shipowners, suppliers, universities and Germanischer Lloyd. In 1976 we were appointed by the ministry to participate in all research and

development (R&D) in ship and maritime technology supported by it. In 1991, our role was significantly enhanced to that of project manager for ship technology, which includes the administration of research funds. In this role, to the end of 1992, we have been involved in 134 projects concerned with ship technology, many of these being directly connected with ship safety.

It has been a fruitful arrangement for those involved, one result being the large scale Ship-of-the-Future project which gained distinction worldwide and advanced ship safety in a number of aspects.

GL is also much involved in the follow-up R&D program dubbed

"Ship Operation System" (SHOPSY), which is due for completion in July 1994. This is also being sponsored by the ministry for research and technology, and its results are intended to further enhance the safety and reliability of seagoing vessels. It is intended to set the fundamentals of ship operation for the future, including advances in automatic collision avoidance.

• Safety Through Quality

We recently launched an independent, specialist subsidiary company to meet the growing demand for the certification of quality assurance systems for sea transport, as well as for ship components and design. The new company, GLQZ, has a staff of 63 auditors and experts with special training and experience, based in different countries throughout the world. Audits will be carried out in the local language of each country.

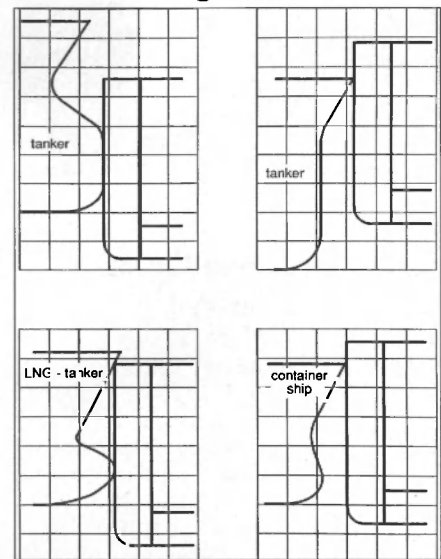
The demand for accreditation by an impartial body has been growing rapidly as quality assurance systems are an emerging factor in the competitiveness of companies and in ensuring maximum safety at sea. The Single European Market has heightened the importance of quality assurance systems as an element in safety and competition, and GLQZ is certifying systems in accordance with ISO 9000.

In 1991, GL became the first German body authorized to certify quality assurance systems by both the Dutch and German government agencies, recognizing GL as an independent body for certifying in compliance with Euronorm 45012. GL first began to assess quality assurance systems when certifying products in the 1960s, and set up its own office for this purpose in 1988.

• Targeted Safety Campaigns Show Promise

To achieve maximum safety at sea, our campaign to raise safety standards in bulk carriers is showing some very positive results. Our special task force of surveyors dealing with the safety problems of older bulk carriers has been hard at work since its formation in 1991. Up to January 1, 1993, and with the agreement of owners, 60 bulk carriers of more than 10,000-gt each and over

Figure 1



15 years of age have been subjected to an extraordinary survey. Eleven have left the GL register since the new surveys were instituted. The specially qualified surveyors are located in many parts of the world, including the U.S.

The survey results are analyzed at our headquarters in Hamburg. The results, supported by investigations by other organizations on an international basis, have made a substantial contribution to pinpointing the main causes of ship loss and damage. Ultimately, the findings will result in new rules and instructions for periodical surveys for bulk carriers and elderly vessels of other types.

It is interesting to note that to maintain the highest standards of ship safety under our class, GL turned down applications for 267 ships of nearly 600,000-gt in 1992. Similarly, due to our high standards, 319 ships of some 1.3 million gt left our register during that year.

• Tanker Safety: Determining Collision Resistance

Since 1983, GL has been involved in determining the collision resistance of ships in a research program on tanker safety sponsored by the German ministry for research and technology. GL was the first classification society to develop an index number to express the collision resistance of a ship. The requirements for the issuing of this index number have been included in GL

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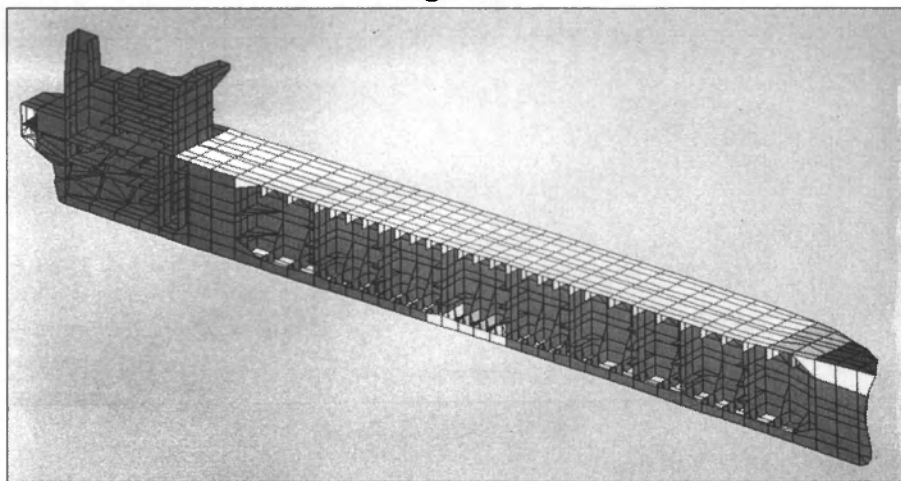
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Figure 2



Maritime Reporter/Engineering News

rules since 1986.

Recently, GL was commissioned by the five European shipyards involved in the development of the E3 double-hulled tanker to calculate and assess the collision resistance of this vessel. The 280,000-dwt ship has a capacity of two million barrels and is designed to fulfill all of today's environmental regulations, as well as those expected in the future. The assessment of collision resistance was based on a collision between two moving vessels of the same size, and between a moving vessel and a stationary vessel, with variation in the draft of both vessels. Two different bow shapes for the striking vessel were investigated: a bulbous bow and a raked bow (see Figure 1).

GL is also breaking ground in the technology of surveying older tankers and bulk carriers. The methods used so far have been based on the principle of visual inspection by competent experts, supported by thickness measurements. The selection of the areas of the ship to be surveyed and measured has, to a large extent, been concentrated on suspected weak spots, and has depended on the experience of the surveyor. It has not been possible to predict and localize these areas with precision. The difficulty has been exacerbated by the extremely tight schedules under which the surveyors have to work.

The result has been that decisions affecting the current and future safety of ships have been made under far from ideal circumstances. This was of less importance in earlier times when ships were smaller and of considerably higher residual strength, but is not satisfactory for the older, larger vessels now at risk. GL has begun to break new ground by bringing sophisticated computer and laser measurement technology to bear on the problem. This is being supported by pressure tests to determine deformation of bulkheads and outer plating under load, and by measuring and analyzing the natural vibration of the vessel. These calculations should provide a much more scientific basis for the surveyor before commencing a visual survey.

All this enables a visual display computer model to be built up (see Figure 2) showing all of the structural components of the ship with their permissible corrosion allowances. From the thickness measurements of many investigations by GL surveyors throughout the world, the critical areas are determined in relation to the ship type, and are incorporated into the model. In this way, a forecast can be made of the structural strengthening that may become necessary at a later stage, or the operation limitations that may have to be imposed on the ship. It will also permit additional strengthening calculations to be made without any great additional effort. We believe that these sophisticated models will mean that the existing procedures for classifying the older, larger vessels, will change soon, and that GL will once again have made a significant contribution to safety at sea.

Consilium Marine Offers Range Of Safety Products

Consilium Marine develops and manufactures marine equipment and instrumentation under the trade names SAL, Neptumatic, Gunclean and Salwico. The equipment is sold worldwide in large numbers to all types of vessels, to shipyards, to owners and to navies. The company has subsidiaries in Germany, U.K.,

U.S., Japan, Korea and China, as well as agents and representatives in more than 40 countries. The Consilium Marine product range includes: SAL speed logs; Salwico fire alarm systems and gas alarm systems; Gunclean tank cleaning systems; and Neptumatic waste water and sewage treatment plants.

For additional information on Consilium Marine products,

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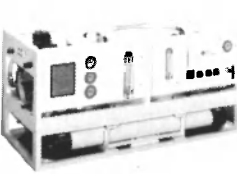
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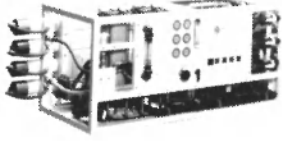
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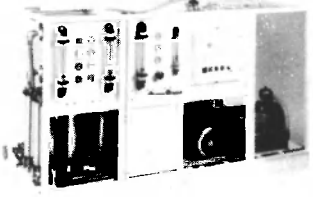
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Study Looks At Marine Losses, Casualties Since 1984

A recent study presented by The Institute of Mathematical Statistics and Operations Research (IMSOR) from the Technical University of Denmark uncovers the correlation between casualty rate and a vessel's age. Technical Report No. 8/1993 entitled "Trends in Marine Losses and Major Casualties: 1984 - 1992," completed by P. Thyregod and B.F. Nielsen, reports that the number of casualties for vessels 10,000-dwt and larger (reported by the Institute of London Underwriters) have increased from 53 in 1984 to 117 in 1992 (or 7.1 casualties per 1,000 vessels in 1984; 12.3 per 1,000 in 1992). During the same period, the average age of the fleet increased from 9.4 years to 13.5 years. The Copenhagen shipyard Burmeister & Wain Skibsværft A/S has been an active proponent in the age versus casualty debate. The following graphical illustrations represent some of the report's findings.

Bulk Carriers: Casualty Rates In Relation To Age

	Year								
	84	85	86	87	88	89	90	91	92
Casualties	28	41	39	54	36	40	58	61	59
Vessels	3,838	4,136	4,305	4,203	4,205	4,271	4,370	4,443	4,484
Casualty rate per 1,000 vessels	7.29	9.91	9.06	12.85	8.56	9.37	13.27	13.73	13.16
AVG. AGE	9.52	9.74	10.03	10.20	10.85	11.65	12.38	13.09	13.82

worldwide network which includes referral to multi-lingual physicians and hospitals, legal assistance, patient monitoring and other on-shore services; professional coordination of evacuations; medically supervised repatriations; full pharmaceutical stores on board; and training sessions to instruct personnel in CPR and how to assist in diagnosis.

For more information,

Circle 65 on Reader Service Card

USMSA Has New Directory Available

The U.S. Marine Safety Association (USMSA) has available its 1993/

Yearly Number Of Casualties Based On Casualty Type

Category	Year									Total
	84	85	86	87	88	89	90	91	92	
Collision	10	24	11	25	22	29	30	20	23	194
Fire	13	16	21	13	14	27	30	25	34	193
Machine	6	4	6	6	6	2	6	10	16	62
Strand	17	34	17	29	26	23	29	23	27	225
Technical	1	2	5	3	5	8	7	9	9	49
Unknown	3	5	4	1	1	2	4	9	1	30
Weather	5	8	14	24	14	13	20	26	17	141
Military	36	26	67	109	54	0	0	2	0	294
TOTAL	91	119	145	210	142	104	126	124	127	1,188

Tankers: Casualty Rates In Relation To Age

	Year								
	84	85	86	87	88	89	90	91	92
Casualties	18	27	19	25	27	40	37	35	36
Vessels	2,761	2,760	2,741	2,769	2,827	2,908	2,998	3,099	3,221
Casualty rate per 1,000 vessels	6.52	9.78	6.93	9.03	9.55	13.76	12.34	11.29	11.18
AVG. AGE	9.52	10.08	10.54	11.05	11.64	12.22	12.81	13.36	13.72

1994 Membership directory. It is a current listing of company personnel, addresses, telephone and fax numbers for more than 145 USMSA member companies. The USMSA is made of companies and individuals who are involved in either the design and/or manufacture of marine safety equipment; who service or sell safety equipment; or who pro-

vide training in the use of such equipment. For a copy of the new directory call: (215) 564-3484.

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Circle 229 on Reader Service Card

the Straits of Malacca, Japan's Ministry of Transport and Ministry of International Trade and Industry (MITI) will jointly set up a council comprised of Japanese shipping and oil industry bodies.

The council, which is reportedly expected to be formed before the end of the current fiscal year ending March 31, is aimed at creating an information network of related groups such as the Petroleum Association of Japan and the Japanese Shipowners' Association.

Oil Spill Financial Responsibility To Increase

The Department of the Interior's Minerals Management Service (MMS) published an Advance Notice of Proposed Rulemaking (ANPR) in the Federal Register advising all operators of facilities handling oil and oil products located in, on or under the navigable waters of the U.S. that they will need to provide evidence of financial responsibility.

OPA 90 mandates the development of new regulations to implement provisions of the law that increase financial responsibility requirements for Outer Continental Shelf (OCS) operators handling oil from \$35 million to \$150 million. For the first time, all operators in, on or under navigable waters of the U.S. and its territories will face new regulations establishing the identical \$150 million requirement.

"The law contains provisions aimed at strengthening oil spill prevention, response capability and clean up efforts, as well as ensuring payment of damages resulting from oil spills should they occur," said MMS director **Tom Fry**.

Raytheon Acquires Exclusive Distribution Rights For Kannad EPIRB

Raytheon Marine Company has acquired the exclusive distribution rights for the Kannad 406 MHz EPIRB in North America. The Kannad EPIRB complies with IMO and GMDSS requirements for Category I (float-free) and Category II (non float-free) systems. The Kannad EPIRB will alert search and rescue authorities to pinpoint a ship's location within one nautical mile anywhere in the world, and is the only one to be simultaneously type approved by the four founding members of the COSPAS/SARSAT program.

The Kannad EPIRB is available in two versions: a 406S manual, and a 406FH float-free.

For free information from Raytheon on the Kannad EPIRB,

Circle 76 on Reader Service Card

ABS Launches New SafeHull System: Designed To Provide Long Term Safety, Savings

American Bureau of Shipping Chairman **Frank Iarossi** announced the launching of the class society's SafeHull System for the design and evaluation of ship structures.

"SafeHull resulted from an ambitious three-year, \$4 million research and development undertaking to improve ABS Rules (Rules for Building and Classing Steel Vessels), the largest R&D effort ever undertaken by ABS," Mr. **Iarossi** said. "With

Japan Shipyards To Increase Imports To Compete

Various market factors including the surging yen and fierce competition from European and Korean yards are forcing Japanese yards to reevaluate current procedures.

A number of the major yards have set up project teams in order to raise the imported content of vessels, according to the Japan Ship Centre. For example, Sumitomo Heavy Industries (SHI) has established a team at its Oppama yard to increase imports to 10 percent of total equipment machinery, and Ishikawajima-Harima Heavy IndustriesI has established a similar team.

Other yards are improving and expanding links to overseas yards. For example, Mitsui Engineering & Shipbuilding (MES) has a technical agreement with Hudong Shipyard in Shanghai and has plans to import cargo access equipment from Samsung of Korea. MHI has established a joint venture with Jiangnan Shipyard of Shanghai for manufacture of marine equipment, machinery and steel. SHI also has a joint venture in Shanghai, which includes

plans of importing low-priced marine equipment. A recent report from the Kaiji Press reports that **Terushi Nishiguchi**, the newly appointed general manager of IHI, has called for drastic restructuring of the nation's shipbuilding industry. Reportedly IHI plans to procure seven to eight percent of ship machinery and equipment overseas when building certain vessels.

And unless further orders are secured, the Kobe building dock of Kawasaki will be empty for nine months following the floating out of a 70,000-dwt bulker at the end of February 1994, until the keel laying of an LNG carrier in December of that year. According to the Japan Ship Centre, the future product mix in Japanese yards is difficult to predict, as it is with any yard, but all indications are the yards will: aggressively pursue VLCC construction, as many have recently completed investment programs aimed to ensure efficient double hull tanker construction; and seek LNG carrier orders.

the availability of the ABS SafeHull System, shipowners, operators, builders and designers will have the capability to thoroughly quantify the dynamically induced stresses that could exist in a ship structure. This new capability will lead to a more optimum distribution of steel in a ship's structure, which, in turn, will lead to a significant reduction of structural failures due to the effects of yielding, buck-

ling and fatigue." Included at the unveiling, which was held at a special news conference held in New York City, were comments from Dr. **Donald Liu**, ABS senior vice president-technology, under whose direction SafeHull was developed. "In essence, by uniquely combining an engineering first-principles approach with our experience and technology, ABS has finally been able to

(Continued on page 46)

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Circle 277 on Reader Service Card

(Continued from page 45)

create a system of formulations that represents the complex, real-life experience of a ship at sea." The final development of the product, however, is not entirely complete. To date, the system is applicable only to tanker structures. In time, it will be expanded to include bulk carriers, container carriers and other vessel types.

Furthermore, there are plans to expand the capabilities of the program to analyze existing vessels, to identify stress areas and establish

an appropriate inspection schedule to monitor these areas, said Mr. **Iarossi**. For more information on SafeHull from ABS,

Circle 77 on Reader Service Card

IDB Mobile Part Of Project Condo Cooperative Venture

IDB Mobile Communications, Inc.

of Los Angeles has approved Project Condominium, a cooperative venture with Cable & Wireless, Hong Kong Telecom, Teleglobe Canada and Morsviazspudnik, which enables IDB Mobile to enter Inmarsat's next generation of digital services, called Inmarsat B & M.

The five carriers are building two dual earth stations, one in Hong Kong and one in Laurentides, Canada. The Hong Kong earth station will serve the Pacific Ocean Region (POR) and Indian Ocean

Region (IOR) and the Canadian earth station at Laurentides will serve the Atlantic East and West Ocean Regions. Under Project Condo, the earth stations will offer access to other carriers under multi-identification numbers and will be linked by dedicated circuits, enabling customers to access any of the four ocean regions from a convenient single point.

"The truly unique aspect of Project Condominium is that the earth stations will have the ability to accommodate up to 10 signatories and/or Inmarsat service providers by allowing them to place their own land earth station ID number in the earth station," said **Jon Klein**, president of IDB Mobile. "As a tenant in Project Condo, the operator will have his own virtual earth station with a full range of services while investing less than 10 percent of the cost he would face if he built his own station." For more information on IDB Mobile,

Circle 7 on Reader Service Card

Lytron Heat Exchangers Stocked For Off-The-Shelf Delivery

Available from stock in three core sizes, Lytron 5000 Series, all-aluminum, fin-and-tube heat exchangers provide thermally-effective heat transfer in packaged heat removal systems using coolants less effective than water.

Made entirely of aluminum, Lytron 5000 Series heat exchangers have outer fins brazed to the tubes. The tubes are thermally-enhanced with Lytron's proprietary INNER-FIN extended surface on the inside of the tube circuit. Strength and durability is achieved through brazed and welded joints throughout. The brazed core, combined with the all-welded frame construction, provide a reliable, compact and thermally-effective heat exchanger. For more information on Lytron 5000 Series heat exchangers,

Circle 9 on Reader Service Card

Cruising Generator Provides Onboard Electrical Power

The Auto-Gen marine cruising generator, from Mercantile Manufacturing, becomes a fuel efficient source of onboard electrical power when hooked up to a boat's main engine. The heavy duty generator has a power output of 6.5kW, and is designed as a boat's primary electrical source or as a backup to separate gensets. The Auto-Gen unit operates best when driven by the engine's crankshaft pulley. However, any accessible engine pulley that provides adequate speed and belt size can be used. The generator operates either clockwise or counterclockwise, so a port or starboard mounting is possible. For more information,

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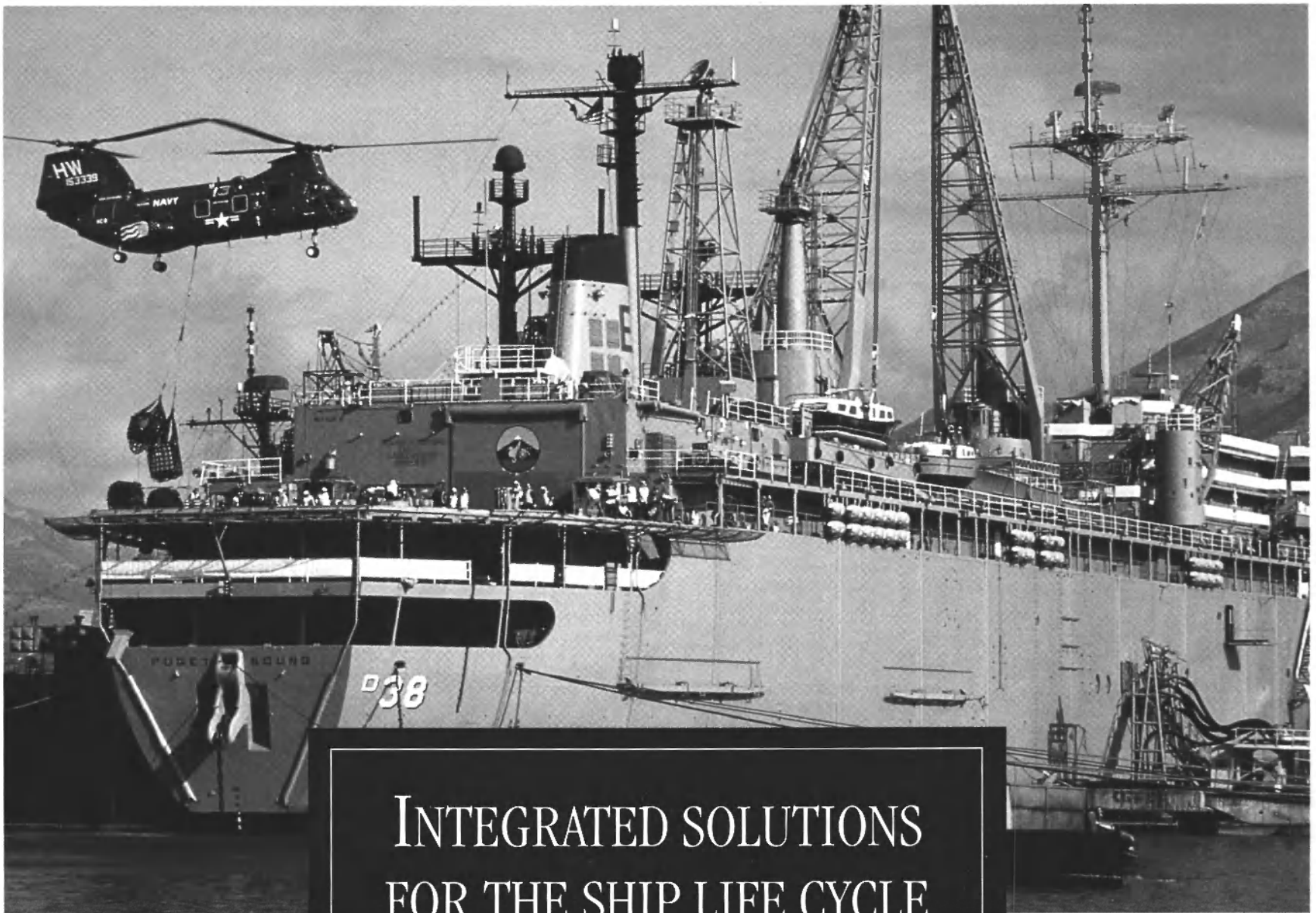
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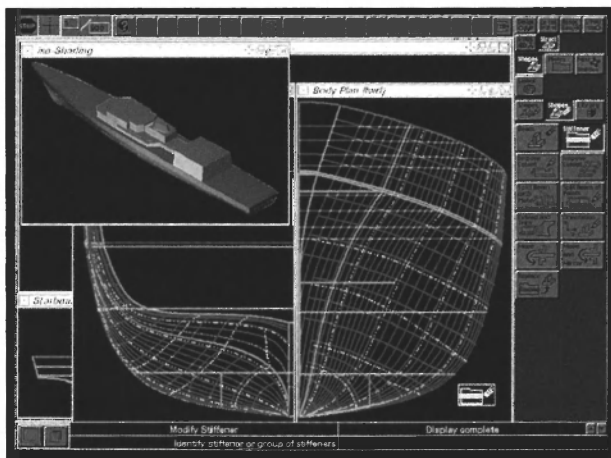
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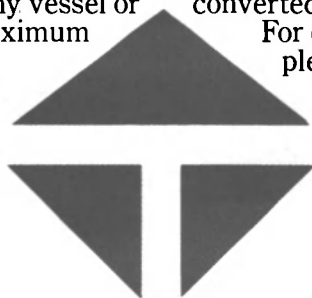
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Circle 259 on Reader Service Card

Pan-United Shipyard Delivers Three Harbor Tugs To Port Of Singapore



One of three harbor tugs delivered by Pan-United Shipyard.

Pan-United Shipyard Pte. Ltd., a subsidiary of Pan-United Corporation Pte. Ltd., has delivered three 2,700-bhp harbor tugs.

Each vessel is propelled by two Stork-Wartsila 6FHD240 diesel engines.

To provide maneuverability, two Aquamaster steerable thrusters are installed. Electrical supply is provided by two 87kW Caterpillar diesel generators.

The vessels achieved a free running speed of 12.5 knots and a bollard pull in excess of 30 tons.

The building of this series of harbor tugs is the second project undertaken by Pan-United for the Port of Singapore Authority.

The first project, carried out in 1992, was the fabrication and installation of two sets of link bridges at the Cruise Terminal at World Trade Center, Singapore.

The 92-foot harbor tugs, named "TG 5," "TG 6" and "TG 7," are owned by the Port of Singapore Authority.

The vessels have a beam of 31 feet, a depth of 15 feet and a draft of 11 feet.

For more information on Pan-United Shipyard,

Circle 5 on Reader Service Card

Ingalls' Second SA'AR 5 Corvette For Israel Launched


The second of three SA'AR 5 corvettes being built for the government of Israel by Ingalls Shipbuilding division of Litton in Pascagoula, Miss., was guided to her outfitting berth after being launched on Friday, Aug. 20, 1993, at Ingalls. After final outfitting and sea trials, the 281-foot long ship is scheduled to be delivered in 1994. Ingalls has one additional ship of the class under construction.

For more information on Ingalls,

Circle 14 on Reader Service Card



An Ingalls-built SA'AR 5 Corvette.



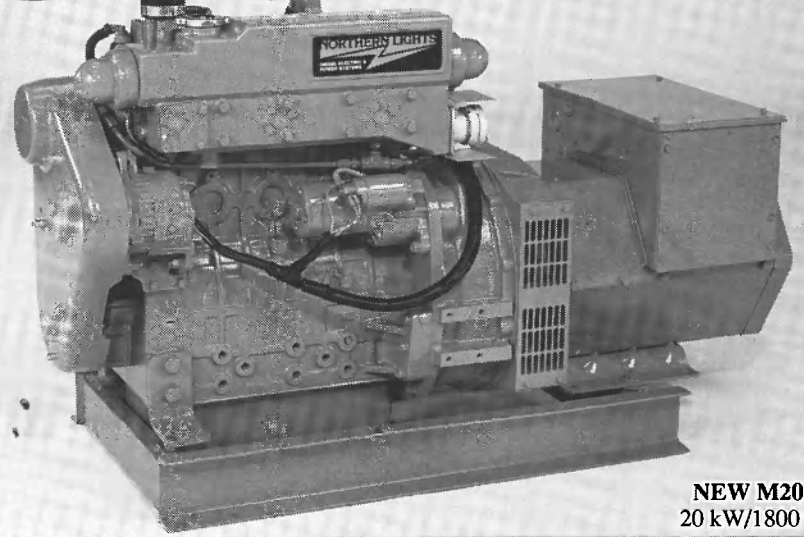

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Peterson Builders Delivers Ferry William Market To Miller Boat Line



Peterson Builders, Inc. (PBI) of Sturgeon Bay, Wis. delivered the ferry "William Market" to Miller Boat Line, Inc. of Put-In-Bay, Ohio. The "Market" is 96 feet long, has a 38.6-foot beam and is capable of carrying 26 cars and 260 passengers. Designed by Timothy Graul Marine Design of Sturgeon Bay, Wis., major equipment on the Market includes:

- Two Caterpillar 3412 DITA diesels, 605 hp @ 1,800 rpm, each with 54-inch by 44-inch 4-blade bronze wheel through Twin Disc MG-520 gears, 4.03:1 reduction
- Two Northern Lights 33 kW; 120/240v/60Hz/1 phase generators.

PBI had previously built two other similar ferries for Washington Island Ferry Line of Door County, Wis. For more information on Peterson Builders,

Circle 49 on Reader Service Card

Damen Shipyards Delivers 22nd Damen Combi Coaster 125



Another Damen Combi Coaster 125 has been delivered by Damen Shipyards in The Netherlands.

The M.S. Sandwater was delivered to Krey Schifffahrts GmbH & Co. KG on June 29, 1993, the 22nd vessel in succession delivered of the Damen Combi Coaster 125 range.

The 3,040-dwt vessel is 290 feet long, with a beam of 41 feet and a draft of 15 feet. The Sandwater is intended for sea and river transport of containers as well as bulk cargo. The hydraulically movable wheelhouse allows the vessel to pass bridges with low air draft. The

vessel is classed by Germanischer Lloyd + 100 A5. For more information on Damen Shipyards,

Circle 57 on Reader Service Card

M.S. Sandwater Equipment List

Main engine	Deutz MWM	Propeller	Lips
Generator engine	Caterpillar	Navigational aids	Navicom
Separators	Alfa-Laval	Emergency boat davit	Schat Davit
Coatings	International Paint	Steering gear	Sperry

Gladding-Hearn Delivers New Pilot Boat

The San Francisco Bar Pilots has taken delivery of its first pilot boat built by Gladding-Hearn Shipbuilding, The Duclos Corp. Designed by the Somerset, Mass. shipyard and C. Raymond Hunt Associates of Boston, the 67-foot vessel, called the Golden Gate, has a deep-V hull that reaches speeds of 25.5 knots. The twin-screw, all-aluminum vessel, which measures 18 feet abeam and draws six feet, is an all-weather boat powered by Caterpillar Diesel 3412 DITA engines, each rated 764 bhp at 2,100 rpm. The engines drive two 36-inch nickel-bronze propellers via ZF 2.5:1 reverse/reduction gears and Aquamet 17 shafts.

For more information on Gladding-Hearn,

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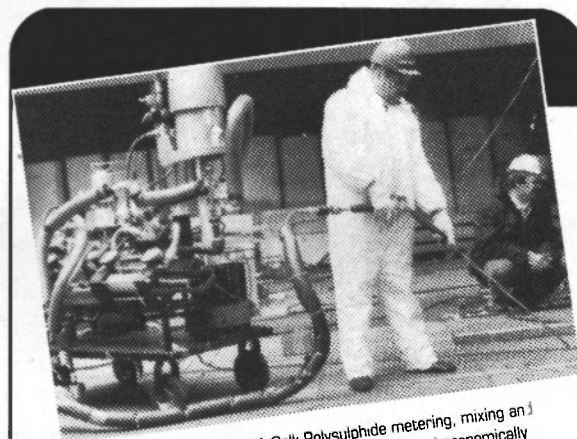
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Ship Repair & Conversion '93

Following the success of last year's ship maintenance conference exhibit, Ship Repair & Conversion '93 returns to Olympia 2 London, England, November 9-10, 1993.

Ship Repair & Conversion '93 is the major international meeting dedicated to the shiprepair, conversion and maintenance industry. More than 79 shiprepair yards are expected to attend this year's conference. The main message from previous conferences was that the industry has yet to experience the

resulting increase in trade as governments and international regulatory bodies strive to make the world's fleets safer and better maintained. This will inevitably add to the core business the shiprepair industry presently receives from an ever-agging global merchant fleet. For more information, contact: **John Gwynn-Jones**, Director, BML Business Meetings Limited, 2 Station Road, Rickmansworth, Herts WD3 1QP, England, tel: +44 923 776363; fax: +44 923 777206.

For the first time ever, there will be a major U.S. presence at the Ship Repair & Conversion '93 show. A pavilion will be organized in conjunction with the Shipbuilders Council of America, and a number of U.S. shipyards will be represented, including (note: list current at press time):

Atlantic Marine, Inc.
BethShip-Sparrows Point Yard
Avondale Industries, Inc.
Metro Machine Corporation
Newport News Shipbuilding
Norshipco
Southwest Marine, Inc.
Marine Hydraulics International, Inc.
Jamestown Metal Marine Sales, Inc.
Hopeman Brothers, Inc.
Teleflex Incorporated

Schedule of Events:

Tuesday, November 9:

Session 1: The Industry

- The Future And Competitive Edge Of The Repair Industry In Singapore: **Tong Chong Heong**, vice president ASMI & executive director Keppel, Singapore
- Hong Kong's Shiprepair Industry Now And After 1997: **Yang Shi Lan**, deputy managing director, Yiu Lian Dockyards, Hong Kong
- The U.S. Shiprepair Industry - A Need For International Market Penetration: **Bob Leber**, director shiprepair, Newport News Shipbuilding & Engineering, USA

Session 2: Operations

- Introduction Of Planned Maintenance Systems Onboard Managed Tonnage: **Lock Parker**, group technical executive, Acomarit, Geneva
- Operating Older Tonnage In A Hostile Environment: **Peter Harrap**, chief engineer superintendent, BP Oil U.K. Ltd., U.K.

- Engine Repair Assistance By Satellite (Ship-To-Conference Demon-

stration): **Lars Brodje**, maritime advisor, Inmarsat, London

Session 3: Shipyards

- Shipyard Development: **Peter Meanley**, director, Posford Duvivier, U.K.
- Shiprepair And ISO 9000: **John De Rose**, operations manager, Quality Services, Lloyd's Register of Shipping, U.K.
- Gas Safety In Repair Yards - People And Equipment: **Karl-Peter Rohlssen**, gas safety specialist, Ibeda GmbH, Germany
- Getting Ready For Refit - A Shiprepairer's Point Of View: **Richard Woodhead**, chairman & chief executive, A&P Appladore (International), U.K.

Wednesday, November 10:

Session 4: Surveys

- Repair Versus Scrap: **Heige Dag Tangen**, vice president & chief representative U.K. & Ireland, Det Norske Veritas, U.K.
- Vessel Inspections/Ship Approval: **Gary Skipp**, manager marine services, Texaco Marine Services, Texas
- How Far Can A Ship's Structure

(Continued on page 52)

Deteriorate Before It Is Impairable?:
John Waite, principal naval architect, The Salvage Association, U.K.
 • Extended Operational Studies: **Tony Brondle**, Aim Safety, U.K.
 • What Is An Enhanced Survey?: **Bob Vienneau**, vice president, ABS Europe Ltd., London
 • Owners' Survey - Shipyard Approval: (Speaker to be announced)

Session 5: Conversions

• Ship Conversion Contracts - The Key Clauses: **Simon Curtis**, partner, Watson, Farley & Williams,

London

• "Val de Loire" - The First Passenger/Car Ferry To Meet The New SOLAS Regulations: **Michael Maraval**, new project department, Bretagne-Angleterre-Irlande SA (Brittany Ferries), France
 • Conversions Of The "Vinius" To The Latest SOLAS Requirements: **Paul Ashcroft**, managing director, Consultancy Services Northern Ltd., Liverpool

Session 6: New Developments In Paints And Coatings

A panel discussion with five of the world's leading suppliers:

International - **C.O. Anderson**, business manager (Anti-Fouling) (Self-Polishing Anti-Fouling - A Scientific Approach)
 Hempels - **Svend Johnson**, deputy director, marine
 Sigma - **Rodney Towers**, marketing mgr. (Ballast Tank Problems)
 Jotun - **Ragnar Jahr/Linda Diamond** (Water Ballast Tank)
 Kansai Paint - **I. Momiyama**, general manager (R&D) (Third Generation Surface Tolerant Coatings)

Exhibitor List (partial):

- Aalborg Ciserv
- ABS Marine Services Ltd.
- Antwerp Shiprepair
- ARNO Dunkirk
- ARNO Saint-Nazaire
- Asmar Shipbuilding & Docking Co.
- Astican
- Astilleros Espanoles SA
- Atlantic Marine Inc.
- Atlantis Engineering & Construction
- Avezaat BV
- Avondale Industries Inc.
- Bahrain Ship Repair Company (BASREC)
- BethShip-Sparrows Point Yard
- Blohm + Voss AG
- BMEC
- Brisard Sud Marine Enterprises
- Brown Brothers & Company Ltd.
- Calvey Marine
- CARENA
- Cascade General Inc.
- China Shipbuilding Corporation
- Computube Ltd.
- Crane Heatex
- Cygnus Instruments Ltd.
- Dakar Marine
- Dorbyl Marine (Pty) Ltd.
- Durban
- Duvalco
- Elgin Brown and Hamer (Ply) Ltd.
- Fibrecheck Marine Ltd.
- Furmanite International Ltd.
- GC Ridley & Co. Ltd.
- Gdanska Stocznia Remontowa
- Globe Engineering Works Ltd.
- Granges Metalock Ltd.
- Harland & Wolff Shiprepair & Marine
- Harris Pye, Marine Ltd.
- Heatex U.K.
- Hellenic Shipyards Co.
- HMV Haugesund Mekaniske Verksted AS
- Hong Kong United Dockyards Ltd.
- Howaldtwerke-Deutsche Werft AG
- Hydrex NV
- Ibeda GmbH
- Jamestown Metal Marine Sales Inc.
- JM Heatexchangers
- KaMeWa AB
- Lloyd Werft Bremerhaven GmbH
- MacGregor-Navire
- Malta Drydocks
- MAN B&W Diesel AG
- Marine Marketing International
- Maritime Reporter
- Michell Bearings
- Mil Davie Inc.
- Mitchell, Shackleton & Co. Ltd.
- Mivan Marine Limited
- MWB Motorenwerk Bremerhaven GmbH
- Nauta Shiprepair Yard
- Navimor-Storem
- Newport News Shipbuilding
- Nicol and Andrew (London) Ltd.
- Norshipco
- Novorossiysk Shiprepair Yard
- Orkot Engineering Plastics Ltd.
- Pan United Shipping (Pte) Ltd.
- Parnica Shipyard
- Pitsudski Gdanski Shiprepair Yard
- Posford Burns
- Radunia Shipyard
- Railko Ltd.
- Rapid Marine
- SAEM
- Sandroid Systems Inc.
- Scamp Ltd.
- Schenker International AG
- Seehafen Verlag GmbH
- Schooner Marine Ltd.
- Ship Care
- Ship Repairers & Shipbuilders Ltd.
- Shipbuilders & Shiprepairers Assoc.
- Shipping World & Shipbuilder
- SIREN
- Skipsreyyen AS
- SOBRENA - Brest Yard
- Southwest Marine Inc.
- Stag Contractors Ltd.
- Stone Vickers Ltd.
- Sun Marine
- Surtest Marine Ltd.
- Tandanor
- Technistitch Ltd.
- TENMAT Ltd.
- The Motorship
- The Naval Architect
- The Shipbuilders Council of America
- Tsakos Industrias Navales SA
- Tyne Dock Engineering Ltd.
- UMC International PLC
- Wilmot Marine Services Ltd.
- Wilton-Fijenoord BV

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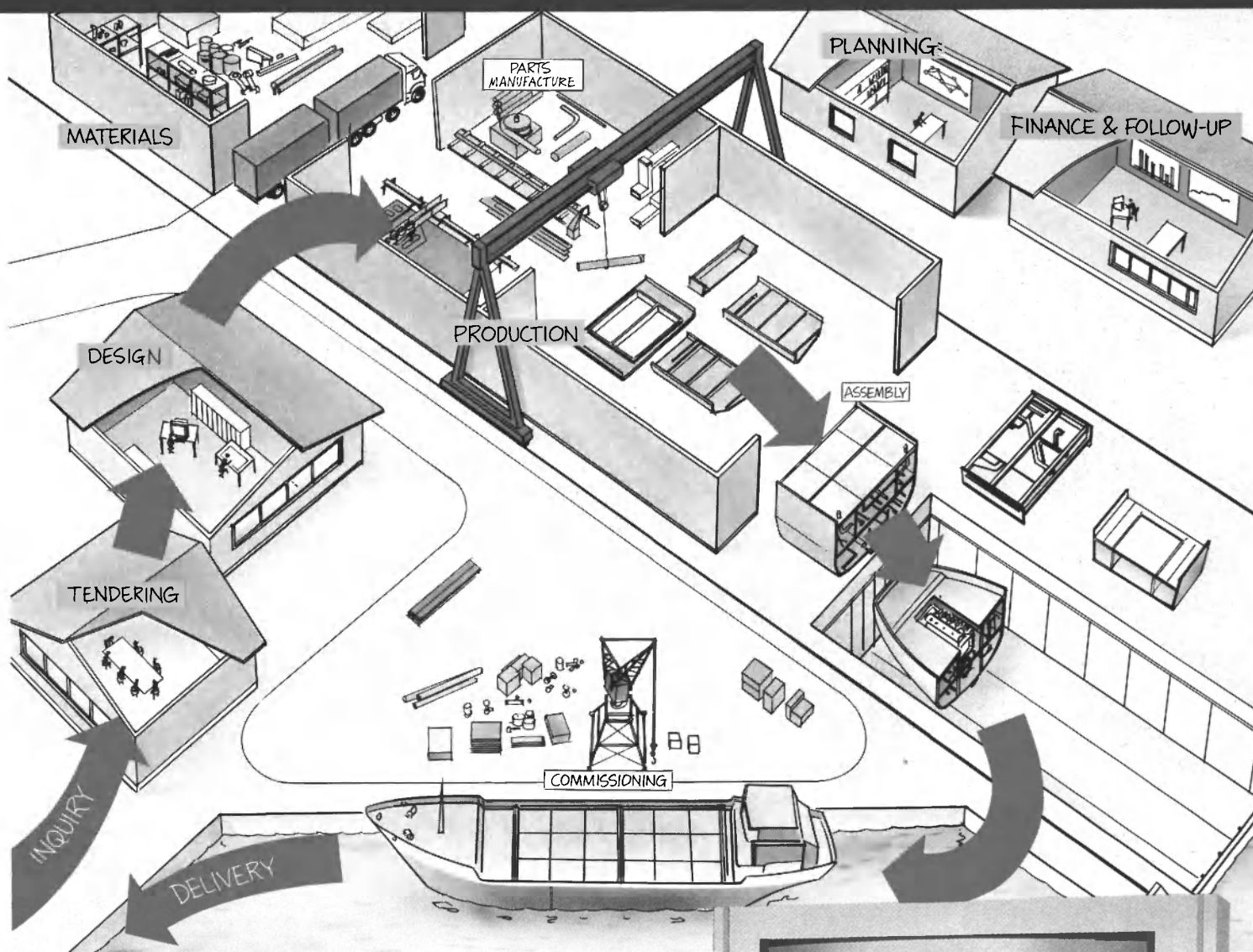
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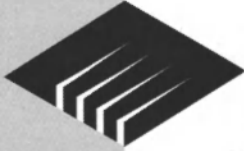
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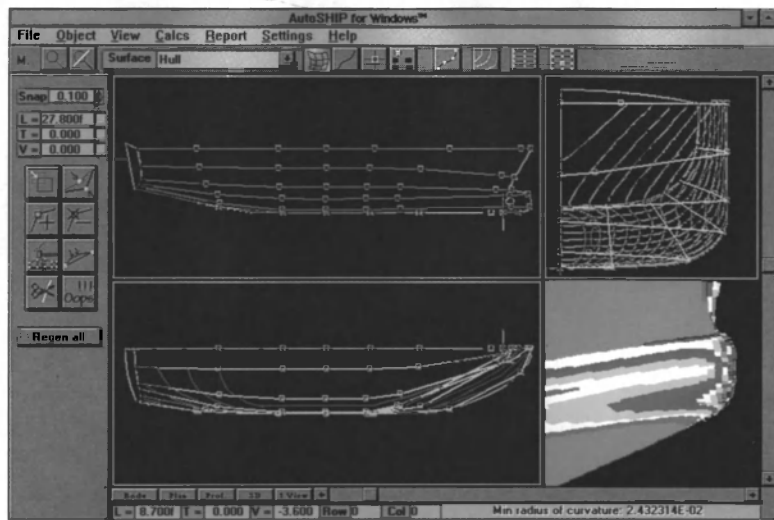
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ELECTRONICS UPDATE



Navico's AXIS line of handheld waterproof VHF radios.

AXIS Submersible Radios From Navico

Navico has introduced AXIS, a line of submersible handheld VHF radios. AXIS radios are built to deliver reliable VHF communications in conditions that render regular handheld VHF radios inoperative.

The AXIS models share innovative design features such as a cast magnesium alloy chassis and case manufactured from an engineering grade polyester/polycarbonate alloy. The case is sealed using stainless steel fasteners combined with an advanced single plane seal system for waterproofing.

Battery packs are designed to the same standards. Mounted in an enshrouded receptacle, the battery incorporates a molded thermoplastic shock-absorbing boot. A single point antenna connection is carved from a single block of stainless steel to ensure the watertight integrity of this critical connection. The shape of AXIS is designed to permit the operation of the radio with one hand, even wearing gloves. Encased in this housing is a five-watt radio with high-standard transmission and reception specifications. With an audio system reportedly twice as powerful as conventional handhelds, AXIS radios can be used in situations that would overwhelm other radios.

All AXIS radios must pass GMDSS tests for shock resistance and waterproofing. The radio is dropped twice on each of its faces from a height of one meter onto a hard surface, then submerged to a depth of one meter in water 60 degrees colder than the operating radio and left for one hour. There was reportedly no moisture intrusion. The company also claims the case is impervious to fuel oil and other chemicals.

Five AXIS models, including two GMDSS-approved units, are available. A full range of accessories, including waterproof speaker/mikes and headsets, rapid chargers, floatation devices, lanyards, and holsters, is available.

AXIS has attracted interest from commercial and military organizations including the Royal English Navy, which Navico supplied with 781 AXIS radios.

For more information on Navico products,

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Maritime Reporter/Engineering News



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The Shipbuilders of Spain

NEW TECHNOLOGY



The Osprey, the first ship of a new class of Minehunters for the U.S. Navy from Intermarine USA, is constructed of glass reinforced plastic.

Intermarine Delivers First Of Minehunter Class

Vessel Is First Glass Reinforced Plastic Vessel For U.S. Navy

Intermarine USA of Savannah, Ga. completed and delivered the first ship of a new class of Minehunter for the U.S. Navy, the USS Osprey, MHC 51, Coastal Minehunter. The ship is the first major vessel to be built of glass reinforced plastic for the U.S. Navy. According to Intermarine, the U.S. Navy selected its glass reinforced plastic as a material not only because it is non-magnetic, but also because of its high shock resistance, its noise and vibration damping characteristics (reportedly six times better than steel); its weight (30 percent lighter than steel); and because of its excellent fire and ballistic protection per unit weight.

The ship will remain at the Intermarine shipyard during the Post Delivery Availability period, and will be formally commissioned on November 20, 1993. The Osprey will then sail to the U.S. Naval base at Charleston, S.C. Following further U.S. Navy ship trials, the vessel will be homeported at Ingleside, Texas in the spring of 1994.

The delivery of the first ship represents the culmination of a successful technology transfer from Italy to the U.S.

In 1986 Intermarine SpA of Sarzana, Italy, was invited by the U.S. Navy to transfer its composite material design and production technology to the U.S. to support the new Coastal Minehunter program. In response, Intermarine USA was established in 1987 following a U.S. Navy contract to build large minehunters using composite materials.

Construction of the Osprey, the lead ship of the MHC-51 Minehunter Class, started in May 1988, one year after the original contract award. The class is 188 feet long with a 900-ton displacement, and is equipped with modern vari-

able depth sonar and an integrated digital control system.

The composite materials fabrication building at Intermarine USA has an area of more than 160,000-sq.-ft. and is equipped with six semi-automatic resin/glass impregnators on fully-articulated bridge cranes. The facility is large enough to house six minehunter vessels or molds, all undercover, simultaneously. Overhead crane service can accommodate loads of up to 66 tons, while the building rail system is used to move complete ship hulls.

Intermarine USA regularly accesses the related composite technologies provided by Ferruzzi companies worldwide. In particular, Intermarine SpA, Tencara, both in Italy and SP Systems in California, combined with Intermarine in Savannah, Ga. to provide a complete capability in the development and manufacturing of advanced composites for marine, aerospace and industrial use. Of particular interest are the carbon fiber/epoxy/honeycomb

core yachts and offshore racing boats. Vessels up to 200 feet long have been successfully built to date and a 118-foot, 50-knot Surface Effect Ship is currently under construction. In addition, a number of fast patrol boats have been constructed using glass and aramid hybrid fabrics, as well as numerous glass reinforced plastic recreational and government agency vessels. In support of the Minehunter program and other contracts, Intermarine has established Technical and Integrated Logistics Support departments staffed with experienced engineers, designers and logisticians.

For more information on Intermarine USA,

Circle 67 on Reader Service Card

Osprey Equipment List

Main engines	Fincantieri Diesel Grandi Motori (FDGM)
Propellers	Voith Schneider
Generators	FDGM
Engine/Steering controls	Paramax
Deck machinery	Pelligrini
Mine hunting sonar	Raytheon
Coatings	International
Pumps	Carver
Ventilation fans	Buffalo Forge
Shaft couplings	Holset
Joiner work	Jamestown Metal Marine
Polyester resin	DSM/Owens Corning
Glass fabric	Vetrotex/Chomaratst
Vacuum sewage	Envirovac
Fancoils	McIntyre
Air compressors	Rix Industries
Air conditioning	York
Reverse osmosis desalination	Village Marine
Anchors	Baldt
Anchor windlass	New England Trawler
Bearings	Michell
Combat system	Paramax



The Osprey's crew at its August 23 delivery.

Pauluhn Electric Introduces New Lighting Fixture Line

Pauluhn Electric introduced a new line of 316 stainless steel, Class I Division 2 lighting fixtures for corrosive and hazardous areas, which complements Pauluhn's existing line of marine fixtures and fittings currently made of cast bronze, brass and marine-grade aluminum.

The H.I.D. fixtures range in power from 70W to 250W in area lighting, and 50W to 1,000W in flood lighting. The fluorescent fixtures are available from 20W to 110W in Class I Div. 1 & 2.

In business since 1918, Pauluhn was one of the companies offering electrical fixtures for vessels when ships were first changing over from kerosene lamps. For more information on Pauluhn Electric,

Circle 6 on Reader Service Card

Stevenson Replaces Vlandis As OMI Senior VP

OMI Corp. announced that **Craig H. Stevenson Jr.**, 39, president of Ocean Specialty Tankers Association, has been named senior vice president, chartering of OMI Bulk Management, the service division of the company. Mr. Stevenson, who will also serve as senior vice president of OMI Corp., is succeeding **George Vlandis**, 64, who is retiring after 22 years of service to the company.

Mr. Stevenson has had an extensive career in the shipping industry beginning with Sabine Towing and Transportation Inc. in Port Arthur, Texas. He was appointed corporate secretary and director in 1979 and executive vice president in 1980. In 1985, Mr. Stevenson was elected to the board of directors of Hvide Shipping Inc. and in 1986 was named vp of development. He also served in 1988 as president and director of Seabulk Ocean Systems, a Hvide Shipping affiliate. In 1989, Mr. Stevenson was named president and director of Ocean Specialty Tankers Corporation, a partnership between OMI Corp. and Hvide Shipping Inc., which markets five chemical tankers in the U.S. coastal trade.

Johnson To Succeed Walsh As Head Of Sulzer U.S.

Marcus J. Johnson has been chosen to succeed **Robert G. Walsh, Jr.**, as president and CEO of the U.S. branch of the Swiss New Sulzer Diesel engine designing and manufacturing company.

A graduate of the U.S. Merchant Marine Academy, with a graduate degree from Seattle University, Mr. Johnson served 28 years with Sea-Land Services Inc. After holding positions in vessel engineering and sea operations, he rose to spend four years managing their fleet as

vp of sea operations. A diesel engine manufacturing agreement with Westinghouse was arrived at during Mr. Walsh's tenure. New Sulzer Diesel is a world leader in design, manufacture, support and R & D of high-quality, heavy-duty diesel engines for maritime propulsion and auxiliary electric power generation and industrial application. For more information on New Sulzer Diesel,

Circle 61 on Reader Service Card

Former Decking Design VP Forms New Floorings/Coatings Corporation

Joe Solomon, former vp and partner in Decking Design, has formed a new corporate venture, International Flooring and Protective Coatings, Inc., based in Norfolk, Va.

"I have taken this step because I

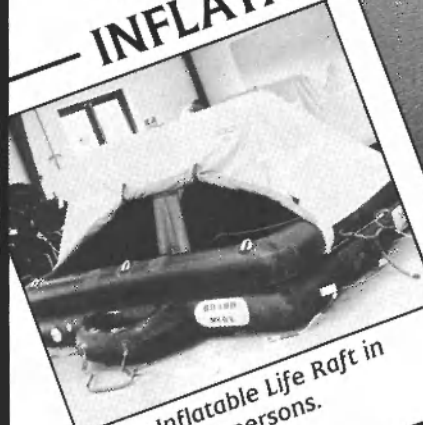


believe I can better carry out my commitment to the finest services and products to valued customers at competitive prices while utilizing those vendors who have served me so well over the years," Mr. Solomon said.

Mr. Solomon announced that this new corporation will afford him the opportunity to explore new challenges in the flooring and protective coatings industry, as well as in other related areas.

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Coast Guard Approves Marine P-V Valve

Electromechanical Research Laboratories, Inc. (E.R.L.) received U.S. Coast Guard (USCG) approval for a new marine pressure-vacuum relief valve. Constructed of stainless steel, the valve was tested in accordance with A.P.I. 2000, the USCG reports, and approved for use in vapor control systems.

The valve, marketed under the name Superac, is an eight-inch, high-velocity model which employs an operating mechanism located outside of the exhaust air stream, to eliminate valve sticking and improve reliability. Stainless steel bearings are used at all pivot points, which greatly improves the accuracy of the valve, the company reports.

E.R.L. tests show the valve is repeatable to within three percent of the set point, and has a total

pressure increase of less than five percent from initial opening to the full-open flow rate.

Other characteristics of the Superac are its quiet operation, simplicity of design, high velocity discharge and manual test levers. Also, the valve can be inspected without tools, the company said.

For more information on Superac from E.R.L.,

Circle 11 on Reader Service Card

NNS Launches 26th Los Angeles Class Submarine

On Saturday, August 28 the Toledo was christened at Newport News Shipbuilding, the 26th Los Angeles class submarine launched there. The event marked the yard's 50th nuclear-powered submarine.

The principal speaker at the event was Secretary of the Navy **John H. Dalton**.

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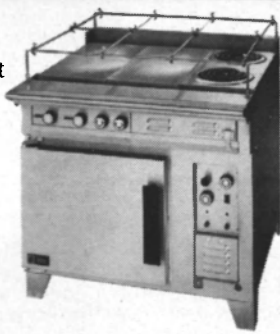


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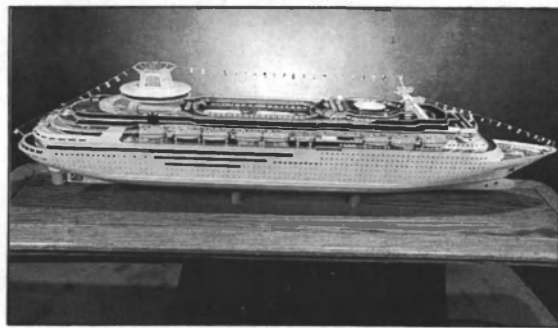


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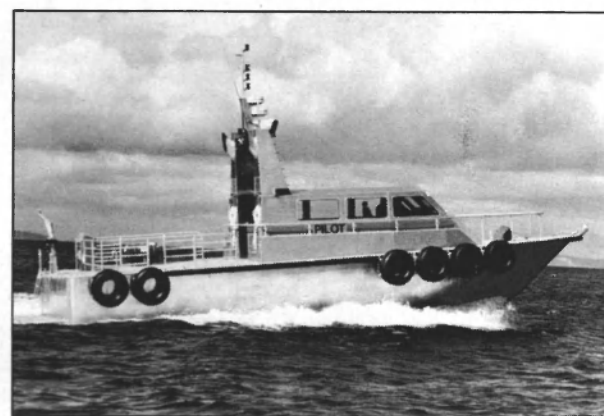
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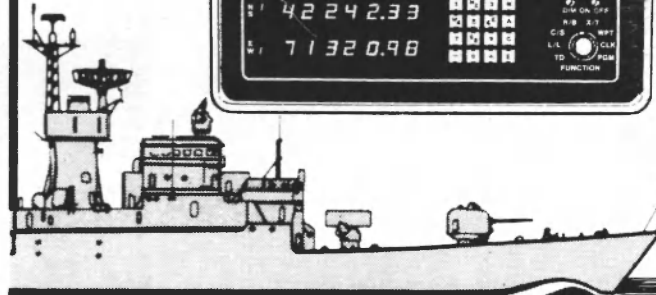
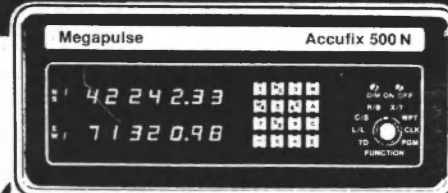


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Nautical Designs Develops Fiberglass Building Technique For Paddlewheeler

Nautical Designs, Inc., a naval architect firm in Fort Lauderdale, Fla., has developed a vessel utilizing advanced building techniques in conjunction with Consolidated Yacht Corporation (CYC) of Dania, Fla.

The first vessel utilizing the technique will be a 142-foot long paddlewheeler with 22 passenger cabins for 44 passengers, plus living quarters for 12 crew. It will be operated in weekly cruises on inland waters.

By utilizing fiberglass panel construction that employs a Balsa Baltec core and flame-retardant resins, CYC can produce structural bulkheads that have a smooth, fair gelcoat exterior surface with an interior surface ready for the designer's choice of wall treatments. CYC is reportedly the only builder in South Florida certified by the American Bureau of Shipping for composite fabrication.

The building method has allowed Nautical Designs to develop scantlings that allow for a simpler construction than would be needed for a steel or aluminum vessel, and the finished surfaces will be yacht-quality without the thousands of man hours required to fair and paint a metal vessel to the same standard. Thus construction costs are quite competitive with comparably-finished metal vessels.

Nautical Designs has been established since 1985 and works on all types of vessels.

The bulk of its business is in consultation to cruise lines and working with yachts over 100 feet.

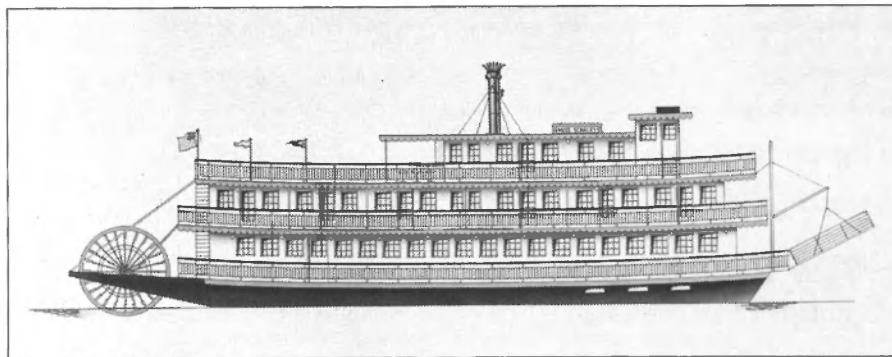
For more information on Nautical

Designs,

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For more information on Consolidated Yacht Corporation,

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Drawing of paddlewheeler to be built using new fiberglass composite technique.

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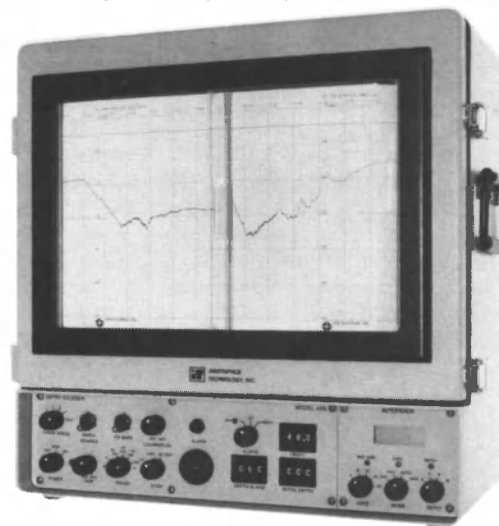
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Contract Awarded To PWH For World's Largest Ship Unloader

PWH Anlagen + Systeme GmbH, a company of Krupp Fordertechnik GmbH, Duisburg/Germany, received the order for a continuous ship unloader after a lengthy negotiation and development phase. It will reportedly be the biggest continuous ship unloader ever built.

With its handling rate of 2,300 t/h, it will be able to unload an ocean-going vessel of up to 100,000 dwt. The customer is ENDESA Empresa Nacional de Electricidad, S.A., Madrid. The ship unloader is to handle imported coal in the port of Ferrol, Galicia. While PWH will supply the core components, supervise installation and manage commissioning, a large proportion of fabrication and services will come from Spain. It is expected to be commissioned in January 1995.

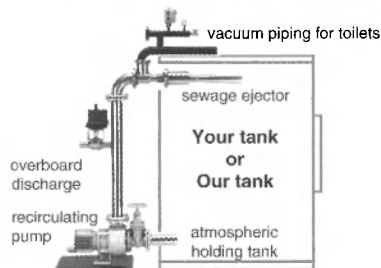
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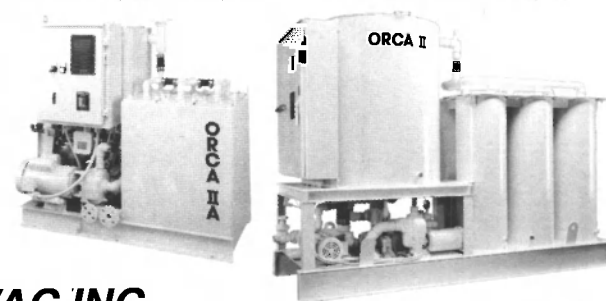
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Circle 217 on Reader Service Card

TANKER STATISTICS

New Tanker Orders, First Half Of 1993

Size Group DWT	Private		Company		Totals	
	No.	DWT	No.	DWT	No.	DWT
10,000/16,499	2	28,000	--	--	2	28,000
16,500/24,999	6	103,200	1	18,130	7	121,330
25,000/29,999	1	28,000	1	29,990	2	57,990
30,000/34,999	--	--	1	34,000	1	34,000
35,000/39,999	3	118,500	--	--	3	118,500
40,000/44,999	2	88,000	--	--	2	88,000
45,000/49,999	3	135,000	--	--	3	135,000
50,000/59,999	--	--	--	--	--	--
60,000/69,999	--	--	--	--	--	--
70,000/79,999	1	70,000	--	--	1	70,000
80,000/89,999	--	--	--	--	--	--
90,000/99,999	5	479,300	--	--	5	479,300
100,000/124,999	2	223,000	--	--	2	223,000
125,000/139,999	--	--	--	--	--	--
140,000/159,999	--	--	4	596,000	4	596,000
160,000/199,999	--	--	--	--	--	--
200,000/249,999	--	--	--	--	--	--
250,000/279,999	2	516,000	--	--	2	516,000
280,000/319,999	5	1,400,000	--	--	5	1,400,000
320,000+	--	--	--	--	--	--
TOTALS	32	3,189,000	7	678,120	39	3,867,120

SOURCE: John I. Jacobs PLC, London

LPG Carriers On Order

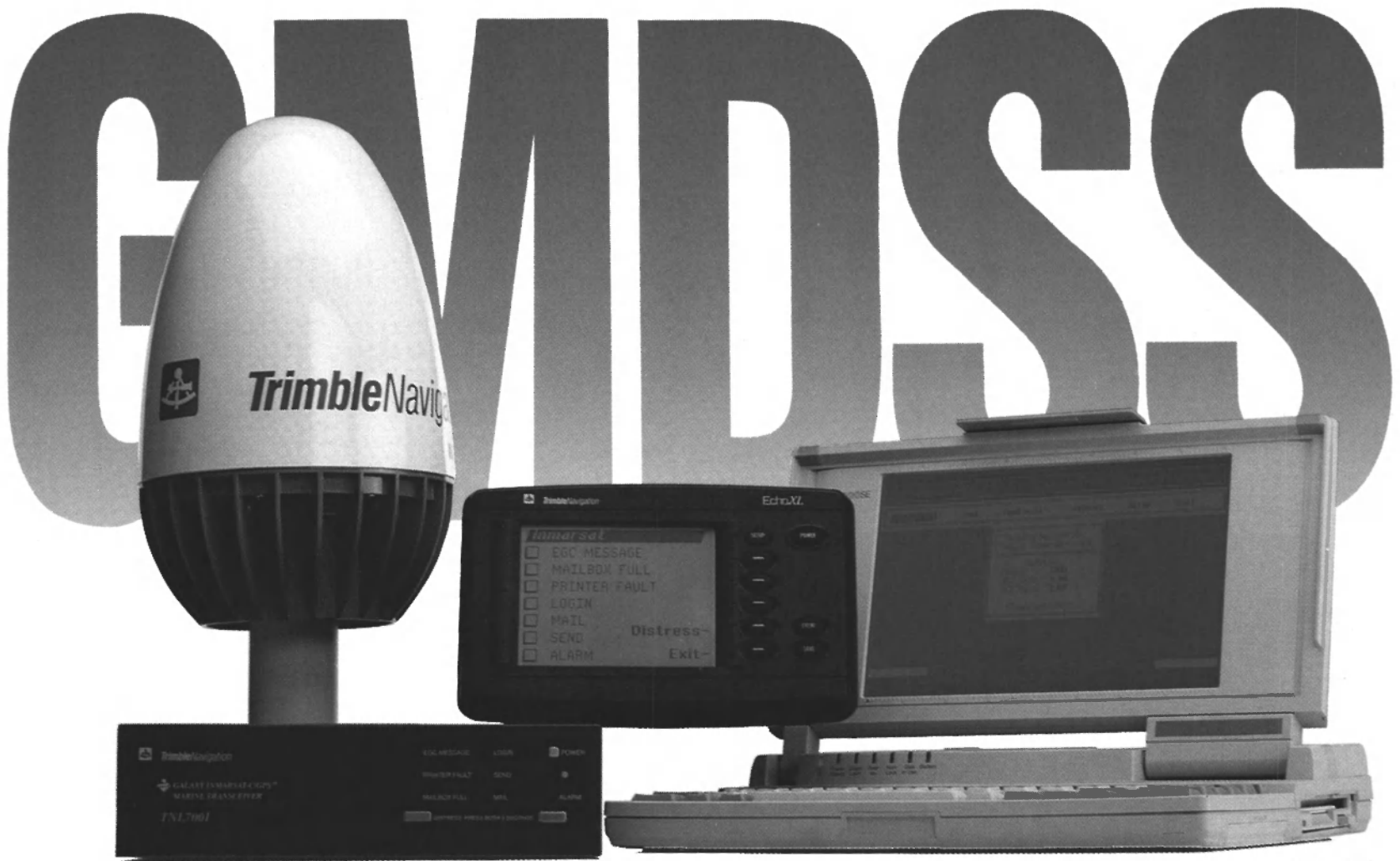
Owners	Capacity (M ³)	Yard	Delivery
Belgium			
Hollming Shipping	12,000	Boelwerf	12/93
Italy			
Petrolnavi	21,000	Apunia	6/95
Soc. Gestioni Navali	(two) 10,500	M&B Benetti	93
Carbocoque Armamento	37,000	Ferrari	1/96
Japan			
Kvaerner	(two) 34,500	Kawasaki	7/93 & 3/94
Kumiai Kosan	75,000	Kawasaki	3/94
KOTC	78,000	Mitsubishi	9/93
Cosmo Petroleum Gas	78,000	Mitsubishi	7/93
Korea, South			
A.P. Moller	18,000	Hyundai	8/93
TOTAL: 11 ships	409,000 M³		

Source: John I. Jacobs PLC

LNG Carriers On Order

Owners	Capacity (M ³)	Yard	Delivery
Finland			
Adnoc	(four) 135,000	Kvaerner-Masa	1/96 to 4/97
France			
Petronas	(five) 130,000	St. Nazaire	7/94 to 7/97
Italy			
Qatargas & SNAM	(two) 65,000	Fincantieri	12/95 & 5/96
Japan			
Marathon & Phillips	87,500	IHI	12/93
Abu Dhabi Gas	135,000	Kawasaki	10/94
MCGC Int. Ltd.	19,100	Kawasaki	2/96
Tokyo Gas	135,000	Mitsubishi	6/94
Abu Dhabi Gas	135,000	Mitsubishi	mid 97
Australian LNG	125,000	Mitsubishi	early 95
Abu Dhabi Gas	(two) 135,000	Mitsui	mid 94/mid 96
NKK/Malaysian Ship	18,800	NKK	7/93
Korea, South			
Korea Gas Corp.	130,000	Hanjin	9/95
Hyundai Merchant Marine	125,000	Hyundai	3/94
Yukong Line	125,000	Hyundai	3/95
Hyundai Merchant Marine	125,000	Hyundai	mid 96
TOTAL: 24 ships	2,750,400 M³		

Source: John I. Jacobs PLC



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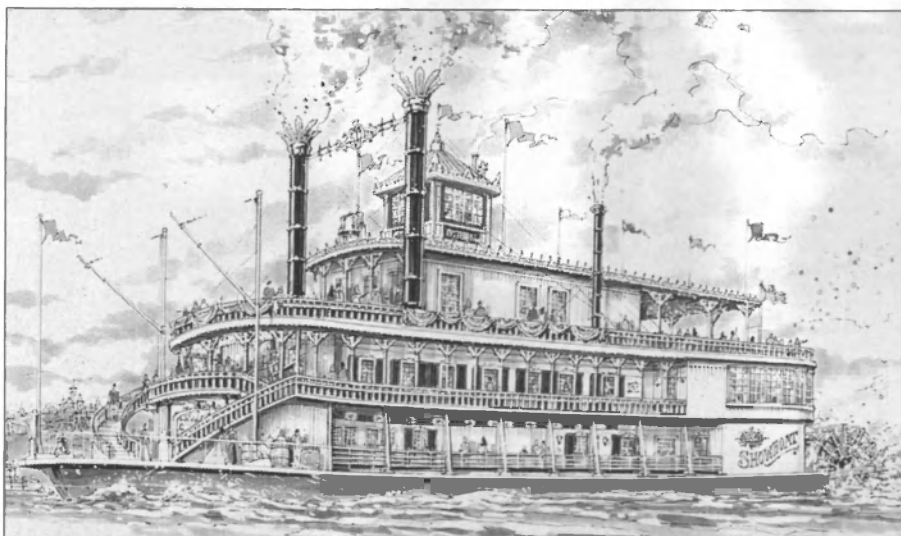


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Artist rendering of the paddlewheel ferry Branson Belle.

Paddle Wheel Showboat Branson Belle Under Construction

Luxurious 19th Century paddle wheel riverboats are the inspiration for the Branson Belle, a turn-of-the-century style showboat under construction on the shore of Table Rock Lake near the White River Landing area of Branson, Mo.

Although it will be landlocked on Table Rock Lake, the owners, who include country singer **Kenny Rogers**, wanted naval architects DeJong & Lebet, Inc., of Jacksonville, Fla. to design a ship to approximate those bygone vessels. The vessel's interior will also be patterned after that period, designed by Directions In Design of St. Louis.

The vessel will be built by Maritime Systems, Inc. of Amelia, La., and co-owned by Silver Dollar City Inc. and Mr. **Rogers**. The U.S. Army Corps of Engineers, which owns the White River Landing where the vessel will be based, will be a regulatory partner.

A maiden voyage is scheduled for April 15, 1995. The ship will cost \$8 million to construct, with an additional \$5 million to be spent for Phase I of the landing, which will feature a ticket office, shops, walkways, and a gangplank for boarding the Branson Belle.

Branson Belle will be driven by twin rear paddle wheels like the ships it was modeled after. Larger than its historical counterparts, it is believed by its owners to be the largest excursion vessel ever built on a landlocked waterway: 240 feet from bow to paddle wheel and 78 feet wide. The hull will be built on a rail or track system, eventually to be launched into the lake where the finishing work will be done.

The ship will be U.S. Coast Guard-approved for 1,000 passengers plus crew, taking them on up to four daily two-hour cruises with dining and entertainment on Table Rock Lake. The ship will have a maximum speed of 10 knots, but will usually operate at between 6 and 7 knots.

Four decks of historically accurate detailing, an ornate pilot house,

painted gingerbread trim, two grand staircases, balconies topped by a stained-glass skylight, and twin majestic fluted stacks rising 98 feet above water level are some of the touches that will add atmosphere to the cruise.

Each cruise will feature a meal and a family-style show in a three-story theater, which doubles as a dining room. The theater will offer a lake view and seat 650 at tables, with additional seating in the theater's balconies.



Co-owner Kenny Rogers behind a model of the Branson Belle, now under construction.

Danish Shipyards Get \$83.5M Subsidy Package

Danish shipyards will receive a subsidy package of nearly \$83.5 million following an agreement between **Jan Troeborg**, the Danish minister for industry, and key opposition parliamentary parties.

Unemployment in the Danish shipbuilding sector has risen significantly in the last six months because of declining orders.

The subsidy put forward by government will take the form of loans at favorable interest rates for shipping lines ordering vessels with Danish wharfs.

Local analysts say that Denmark has given lower subsidies to the ship building sector in the past as compared with its European Community (EC) neighbors.

This is because Danish subsidies were linked to inflation and interest rate levels and these have declined significantly, so the value of the subsidies was steadily eroded, said the ministry of industry.

The new package actually brings the country in line with existing subsidy levels allowed for the sector by the EC. This (the level) is 9 percent of the vessel's contract value, said a spokesman for the Danish industry ministry.

Double First For GEC Alsthom's European Gas Turbines Subsidiary

GEC Alsthom's European Gas Turbines subsidiary (EGT) has won its first-ever gas turbine order in Romania and has secured its first order for an RLM6000 gas turbine.

The order in Romania from state-owned Petrom R.A. is for three Typhoon gas turbine generating sets, two waste heat recovery boilers and 6kV switchgear for a new offshore platform complex in the Black Sea. Delivery is scheduled for February 1994.

The Typhoons will operate on gas and each provide 4.5 MW of electricity, which will supply all of the platforms' operating and domestic energy requirements.

The second order, from Costain Oil, Gas and Processes, Ltd., is for the supply of an RLM6000 gas turbine generating set for a natural gas-fired power station being built in the U.K. for Scottish Power at East Knapton in the Vale of Pickering. The set is due to be delivered in June 1994.

To meet environmental regulations, the unit will be housed in an acoustic enclosure and water injection will be used for emissions control. The RLM6000, the largest machine in EGT's aerodrive range at 40 MW, is a world leader in performance with a reported thermal efficiency of more than 40 percent.

For more information on GEC Alsthom,

Circle 32 on Reader Service Card

COMSAT Expands Inmarsat To Indian Ocean Region

COMSAT Mobile Communications will open a new Indian Ocean Region (IOR) land earth station in Kuantan, Malaysia, to provide its new digital satellite services Inmarsat-M and Inmarsat-B.

The Malaysia station will allow COMSAT to provide global coverage for Inmarsat-M, a voice, data and fax service for smaller vessel and portable briefcase terminals and Inmarsat-B, a digital service for larger vessels and land mobile users with high speed data and large volume communications services.

COMSAT was reportedly the first Inmarsat partner to offer these new cost-saving digital services to its customers and now will reportedly be the only organization to offer a global service through its own earth stations. Inmarsat-M and Inmarsat-B services are currently available in the Atlantic Ocean Region and Pacific Ocean Region through COMSAT's Southbury, Conn. and Santa Paula, Calif. land earth stations, respectively.

The new Malaysian facilities, which will be operated and maintained by the Malaysian PTT, Syarikat Telekom Malaysia Berhad, are expected to be operational by mid-1994.

The agreement between COMSAT and Syarikat Telekom Malaysia Berhad allows COMSAT to add Inmarsat equipment to an existing INTELSAT earth station. The equipment will process COMSAT Inmarsat-M and Inmarsat-B traffic to and from the IOR. The Malaysian station will be linked by dedicated leased circuits to COMSAT's Santa Paula land earth station.

The station will be equipped to provide all of COMSAT's value-added services, including operator assistance, language assistance in more than 140 languages, specialized telephone services, FaxMail services, and other news and information services.

COMSAT Mobile Communications, a division of COMSAT Corporation, provides maritime, aeronautical and international land mobile services to customers around the world. COMSAT Corporation is an international communications, information and entertainment-distribution services company.

For more information on Comsat,

Circle 83 on Reader Service Card

Philadelphia Gear Chosen For New Buoy Tenders

Philadelphia Gear Corp. has been awarded a contract to supply 96DHCMG-CP reduction gears for the propulsion engines of the new 225-foot Juniper Class ocean-going buoy tenders. This class, planned to eventually number 16, will replace the current 50-year-old WLB's.

The gears will combine the power of the ship's two Caterpillar 3608 propulsion engines to a single Bird Johnson controllable-pitch propeller. The first ship of the class, designated WLB-201, was recently ordered by the U.S. Coast Guard from Marinette Marine Corp. of Marinette, Wis. For more information on Philadelphia Gear,

Circle 104 on Reader Service Card

Fourth Litton-Built LHD Amphibious Assault Ship Christened "Boxer"



Boxer, the fourth LHD assault ship built at Ingalls, will be commissioned in 1994.

The fourth vessel in the new Wasp (LHD) class of multipurpose amphibious assault ships being built for the U.S. Navy by Litton's Ingalls Shipbuilding division was christened Boxer on Aug. 28, 1993, at Ingalls' production facility in Pascagoula, Miss.

The 40,500-ton vessel is 844 feet long, with a beam of 106 feet. Two steam propulsion plants, developing a combined 70,000 hp, will drive LHD-4 to speeds in excess of 20 knots.

A total of six ships in the LHD program have been contracted or built by Ingalls, the first being the USS Wasp (LHD-1), delivered to the U.S. Navy in 1989. Following Boxer, which will be delivered and commissioned into active Navy service in 1994, Ingalls has two additional LHDs, Bataan (LHD-5) and Bonhomme Richard (LHD-6) under contract.

Each LHD is the centerpiece of a Navy amphibious ready group. The ships' primary mission is the embarkation, deployment, command and support of a fully equipped U.S. Marine landing force of approximately 2,000 troops by helicopter from the flight deck and by landing craft from a huge sheltered "well deck" in the stern section of the ship. The vessels also operate with naval battle groups, providing aircraft and

command facilities for sea control missions.

For combat support as well as disaster relief and other humanitarian missions, the Boxer will have six fully-equipped medical operating rooms, four dental operating rooms and hospital facilities to care for 600 patients.

The Wasp class is the first class specifically designed to accommodate the air cushion landing craft (LCAC) and Harrier (AV-8B) STO/VL (Short Takeoff/Vertical Landing) jets, which will provide close air support for the assault force. This ship will also accommodate the full range of Navy and Marine Corps helicopters, conventional landing craft and amphibious vehicles.

LHD-4 will have more than 22,000 square feet of vehicle space, and 100,000 cubic feet of cargo space. Accommodations for nearly 3,000 troops and crewmembers (the crew numbers 97 officers and 980 enlisted personnel) are provided in the ship's living areas.

The name Boxer is given in honor of five previous U.S. Navy ships of that name. Most recent was the aircraft carrier USS Boxer (CV 21), which earned eight battle stars for its Korean War service.

For more information on Ingalls,

Circle 62 on Reader Service Card

Foss Maritime Acquires Brix Maritime

Foss Maritime Company and Brix Maritime Company announced that the companies have reached an agreement for Foss to acquire Brix. The transaction was expected to be complete by mid-September.

"The addition of Brix Marine will enable Foss to strengthen its broad range of marine service activities, including harbor services, regional and ocean towing and transportation, vessel repair, and environmental services throughout the Pacific Basin from Alaska to Southern California," explained Tom Van

Dawark, Foss president and CEO.

The acquisition expands Foss into all Oregon and Washington Columbia River ports and the Columbia, Snake River inland region. Brix Maritime Company has a staff of 375, and is supported by a diverse and effective fleet of 60 tugs, 65 barges, and other associated equipment. Services offered by Brix include Columbia and Snake River transport and terminaling, harbor services, log towing and storage; Coeur d'Alene marine services; Pacific Northwest harbor services; Pacific Basin ocean towing; and various ancillary marine activities.

"The combination of strengths of Foss Maritime and Brix Maritime

into one organization will provide our customers with the broadest, most capable and efficient marine transportation and support services available," Mr. Van Dawark continued.

For more information on the services of Foss Maritime,

Circle 42 on Reader Service Card

Sulzer Engines Chosen For Burmeister & Wain Skibsvaerft AS-Built Ships

Two 74,500-dwt bulk carriers recently ordered from Burmeister & Wain Skibsvaerft AS in Copenhagen will be equipped with Sulzer diesel engines. Up until now, only B&W, and lately MAN B&W engines have been used for ships built by this yard.

The ships, which were ordered by Suisse-Atlantique SA, will each have a Sulzer 5RTA62U low-speed engine of 15,100 bhp (11,100 kW) output at 113 rpm.

These five-cylinder engines will be supplied by New Sulzer Diesel of Winterthur, Switzerland, as the main contractor, providing engineering, installation and trial support, while the manufacturing of the engines has been sub-contracted to the licensee Korea Heavy Industries & Construction Co. Ltd.

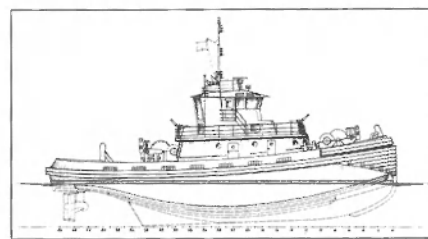
These bulk carriers, the 70 BC Mark V, are an improved version of Burmeister & Wain's popular Panamax bulker design. Burmeister & Wain Skibsvaerft has been highly successful in the past with the batch production of bulk carriers.

These first two Mark V's will be the very first ships at Burmeister & Wain Skibsvaerft in its 150-year history to be powered by a Sulzer diesel engine. It is anticipated that further engine orders will follow as the batch production of Mark V bulkers continues.

For more information on Sulzer engines,

Circle 61 on Reader Service Card

Elliott Bay Designs Multi-Purpose Tug For Tidewater Marine



Outboard profile drawing of a multi-purpose tug Elliott Bay designed for Tidewater Marine.

Tidewater Marine Services of New Orleans has commissioned Elliott Bay Design Group of Seattle to develop a concept design for a new ship-assist/ocean towing tug with submarine-handling capabilities.

The new design envisions a 3,300-hp tug powered by twin Detroit Diesel 16V-149 TI main engines

driving Ulstein 1350-H Z-Drives. Auxiliary power would be provided by two Detroit Diesel 6-71s with 75-kW generators, and a 12V-71 to drive hydraulics and fire pumps. The tug will be 95 feet long overall, with a beam of 34 feet and a draft of 12 feet.

For submarine handling, the boat will feature a cutaway forefoot with bow fendering that extends downward to the keel. Elliott Bay's design also calls for towing and hawser winches for towing and ship handling, plus two 2,000-gpm fire monitors.

"Tidewater asked us for a design to match their well thought-out concept of a multi-purpose tug," noted Elliott Bay President John Waterhouse, "and that's just what this vessel is designed to provide."

For more information about Elliott Bay,

Circle 41 on Reader Service Card

Textron Lycoming TF40s To Power New Super-Yacht

Textron Lycoming announced that two of its TF40 marine turbine engines will be used to power a new super-yacht to be built by John Staluppi, well known in the boating world for his interest in high-speed megayachts.

Bigger and more powerful, yet more traditional in design than other boats built by Mr. Staluppi, this new yacht will be built in the 150-foot range and will be powered with the TF40 turbines and two diesels in a Combined Diesel or Gas (CODOG) configuration.

In a CODOG propulsion system the turbines and the diesels are connected to the same gear box. Generally, the diesel is used for start-up and slow-speed running, with the turbine brought on line for high-speed bursts of power.

According to Carroll Oates, Lycoming manager of turboshaft marketing, "The TF40 has found a significant new market among megayacht owners and designers because it has a high power-to-horsepower ratio, is much lighter, and occupies less than one-tenth the space of a comparable diesel engine. This smaller size and lighter weight allows more flexibility to design craft that are faster than ever before and have more usable space. Additionally, the TF40 is environmentally friendly — meeting or exceeding all current worldwide standards."

Mr. Oates added, "This new vessel is expected to be launched in 1995 and will be built with engineering concepts that will be common in yachts in the year 2000."

Textron Lycoming Turbine Engine Division, located in Stratford, Conn., is a subsidiary of Textron Inc., a multi-industry company with operations in three business categories: aerospace/technology, commercial products, and financial and other services.

For more information on Textron Lycoming,

Circle 85 on Reader Service Card

Sonic Cleaner Helps Boiler Run More Efficiently, Lowers Operating Cost

Infrasonik Inc. of Baltimore, a subsidiary of Infrasonik AB of Sweden, is a pioneer and market leader for low-frequency sound soot removal equipment. Infrasonik's technology is based on maintaining a constant level of infrasound in the boiler with a low frequency (approximately 20 Hz) and

long wavelength (17 to 30 m). The equipment is called Infracone[®] sonic cleaner, and it consists of a sound generator connected to a quarter wavelength resonance tube. The Infracone is running continuously, so all heat transfer surfaces are continuously kept clean. This results in a higher boiler efficiency, and in the end, lower operating costs. For more information from Infrasonik, Inc.,

Circle 75 on Reader Service Card

SIMRAD Robertson Debuts New Trawl Net Monitor

Building on the features of its previous trawl sonar system, SIMRAD Robertson, Inc. introduced the FS 900 Trawl Monitoring System, which is designed as a full-feathered net monitoring system for trawl fisheries. The FS 900 uses specially-designed rotating sonar heads to closely watch underwater activity. Three systems are avail-

able, from a basic, cost-effective sonar with operating depths of 400 fathoms, to the complete system which includes water temperature and catch indicators with an operating depth of 950 fathoms.

For more information,

Circle 70 on Reader Service Card

Underwater Paint System No Longer Experimental

Richard W. Welsford, president of the company which manufactures and promotes the Hycote[™] 151 family of underwater epoxy paints, believes the technology has now proven itself in the marine market. Since their inception in Australia in the early 1980s, the products have been used on various submerged marine structures worldwide.

Hycote was specifically developed to be applied economically by hand, or mechanically, above or below the waterline. Citing a satisfied customer as an excellent marketing tool, Mr. Welsford explains the experiences Seaward Marine has had with Hycote. Seaward successfully applied Hycote across a broad spectrum of ambient conditions underwater, applications ranging from the Persian Gulf in August to the Northern Atlantic in December, from areas as small as 10 square feet to as much as 1,200 square feet.

David Allan, vice president of U.T. Technologies Ltd. said, "The real proof appears when vessels are drydocked. Our coatings that were applied properly underwater are performing better than those applied during a previous drydocking. Owners often are specifying Hycote for the stabilizing fins, struts and rudders, where few other coatings survive," said Mr. Allan.

For more information on the Hycote line from U.T. Technologies,

Circle 72 on Reader Service Card

FCC-Approved Radar Reportedly Helps Cut Operator Fatigue

The Sperry Marine MK-4217R Rasterscan River Radar, already proven on European rivers, has received FCC approval and can now be sold in the U.S. Designed specifically for use on rivers, the new radar consists of two units: a seven-foot or nine-foot antenna/transceiver and the display. A membrane-type illuminated keyboard is used to control the display. The new high-definition radar presentation is free of flicker and jitter, which can help cut down on operator fatigue. The MK4217R River Radar is a breakthrough in display technology for river and waterway applications with its specific close range and confined water navigation, said company vice president John V. DeMaso. For more information on the new Sperry radar,

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ASNE Technical Symposium

Applying Composites In The Marine Environment: Overcoming Barriers, Setting Standards, Progressive Learning

The American Society of Naval Engineers (ASNE) is jointly sponsoring a technical symposium called "Applying Composites in the Marine Environment" on November 8-10, 1993 at the Radisson Plaza Hotel, Savannah, Ga. The symposium is also sponsored by:

- Supervisor of Shipbuilding, Conversion and Repair, USN, New Orleans
- Navy Center of Excellence for Composites Manufacturing Technology

The Society of Naval Architects and Marine Engineers is also participating.

Highlights of the ASNE symposium program to date include:

- Successful Applications of Composites in the Marine Environment
- Marine Composite Design Issues, Concepts and Case Studies
- Marine Composite Research Developments
- Materials and Manufacturing Technology for Marine Composites, and;
- Marine Composites Inspection, Testing and Standards

For more information on the ASNE Technical Symposium "Applying Composites in the Marine Environment," contact: ASNE, 1452 Duke St., Alexandria, Va. 22314-3458; tel: (703) 836-6727; fax: (703) 836-7491.

ASNE Schedule Of Events:

• Sunday, Nov. 7:

5:30 p.m. - 7:00 p.m. - Exhibitors Reception

• Monday, Nov. 8:

7:30 a.m. - 5:00 p.m. - Registration
8:30 a.m. - 9:00 a.m. - Welcome to the Symposium, given by chairman of the symposium **David Guernsey**, Supervisor of Shipbuilding, New Orleans
10:00 a.m. - 5:00 p.m. - Hospitality Room

9:15 a.m. - 10:45 p.m. - General Session A

Paper 101: Technical Issues and Design Challenges for Composite Marine Structures, **L. Smith** - Newport News

Paper 102: Briefing on Intermarine USA Facility and Ship Tour, **B. Eccles** - Intermarine USA

11:00 a.m. - 12:30 p.m. - Session B
Design and Application:

Paper 103: A Comprehensive Design Process for the Application of Composites to the Marine Environment, **E. Bernardon, J. Gorman, G. Ogrodnik** - Draper Laboratory
Paper 104: Design Fabrication and Testing of Resin Transfer Molded Components for Marine Vehicles, **K. Koudela, L. Strait, E. Strauch, R. Marboe, C. Schott** - Penn State University; **R. Brookes** - Sherwood RTM

Materials Technology:
Paper 203: Long-Term Durability

of Fiber/Matrix Interfacial Bonding in Salt Water, **R. Latour, M. Meyer** - Clemson University

Paper 204: A Sandwich Composite using Fiber Reinforced Polymer and a Honeycomb Core as a Candidate for Marine Dock-Deck and Pier-Deck Application, **J. Plunkett, R. Cohen, B. Kunz, J. Kunz** - Mega Marine Structures

1:00 p.m. - 2:00 p.m. - Lunch (Invited speakers: Honorable **Jack Kingston**, Mayor **Susan Weiner**)

1:00 p.m. - 5:00 p.m. - Walking Garden Tour (\$10 per person); 19th Century Antique and Gift Shopping by Horse Drawn Carriage (\$20 per person)

2:15 p.m. - 3:45 p.m. - Session C
Paper 105: Design, Analysis, Fabrication & Testing of a Composite Control Surface, **R. Phelan** - Newport News

Paper 106: The Use of Advanced Composites in Commercial and Military Marine Applications, **D. Cripps** - SP Systems

Paper 205: Sandwich Core Creep at Three Temperatures and Fatigue Properties of End-Grain Balsa and PVC, **J. Chevalier**, Baltek Corp.

Paper 206: Foam Filled Sandwich Structures for Marine Applications, **W. Schmidt** - Northrop Corp.

4:00 p.m. - 5:30 p.m. - Session D
Paper 107: Development of Polymer Composite Sonar Transducer Mounting Hardware, **A. Bray, B. Muskopf, C. Thomsson** - Texas Research Institute/NRL

Paper 108: Thick Composites Fabrication and Embedded Sensor Systems Program, **J. Kelly** - ARPA - Marine Systems Tech. Office
Paper 207: New Construction and Repair with Photocuring Resin and Associated Materials, **B. Pfund** - Pfund Special Projects

Paper 208: Evaluation of Alternative Reinforcements Under Underwater Explosion Environment, **B. Gregory, A. Kurzweil** - CASDE/NAVSEA

6:00 p.m. - 8:00 p.m. - Cocktail Reception; Ships of the Sea Maritime Museum (cash bar)

• Tuesday, Nov. 9:
7:30 a.m. - 5:00 p.m. - Registration
8:15 a.m. - 9:45 a.m. - Session E
Design and Application:

Paper 109: Development of a Filament Wound Composite Radiating Shell for an Underwater Acoustic Transducer, **A. Bray, S. Nichols, R. Westervolt** - Texas Research Institute/NCCOSC
Paper 110: Composite Underwater Instrumentation Housing, **P. Weinhold, P. Biernmann, M. House** - Johns Hopkins University
Materials Technology:
Paper 209: Thermoplastic Polyester Fiber Reinforced Thermoset Polyester Resin Laminates, **S. Lewit, R. Reichard, S. McDowell** - Struc-

tural Composites/Hoechst Celanese
Paper 210: The Effect of Seawater on Thick Polymeric Composite Materials, **W. Bradley, B. Chou** - Texas A&M

10:00 a.m. - 11:30 a.m. - Session F
Fire, Smoke and Toxicity:
Paper 111: Progress in Fire Protection of Composite Structures, **C. Rollbauser, R. Purcell, H. Douglas, C. Beck, J. Ness** - NSWCCARD/Advance Systems Tech.
Paper 112: Development of Fire Safety Standards for Composite Materials Used in Commercial Marine Applications, **Lt. P. Coxan** - U.S. Coast Guard, Ship Design Branch

Paper 211: Using GRP Sandwich Construction in the Marine Environment: Past, Present and Future, **M. Zvanik** - Barracuda Technologies

Paper 212: A New Approach to Low FST Sandwich Structures, **R. Heitkamp** - Ciba Geigy Corp.

11:30 a.m. - 2:00 p.m. - Reception and Lunch (Invited speakers: ASNE H.Q. Speaker **R. Adm. Robert Traister**, Deputy Commander Surface Combats, NAVSEA)

1:00 p.m. - 5:00 p.m. - Historic/Victorian District Tour (\$10 per person)

2:15 p.m. - 3:45 p.m. - Session G:
Paper 113: Fire Performance of Composites Materials for Naval Applications, **E. Greene** - Structural Composites Inc.

Paper 114: An Investigation of Flame, Smoke, Toxicity & Mechanical Properties of Pultruded Phenolic Composites, **T. Dailey, M. Klett, R. Allison** - Indspec Chemical Company/PPG/Creative Pultrusions

Manufacturing & Processes:
Paper 213: Open
Paper 214: Open

4:00 p.m. - 5:00 p.m. - Session H
Paper 115: Fire, Smoke and Toxicity of Composite Materials for Shipboard and Submarine Applications, **U. Sorathia, C. Beck, T. Dupp** - Naval Surface Warfare Center
Paper 116: The Use of Low Smoke/Low Toxicity Phenolic Composites in Marine Applications, **A. Mekjavić**



First of a new minehunter class, from Intermarine USA of Savannah, Ga.

Paper 215: Cast Aluminum Composites for Marine Machinery - Status of Foundry Technology & Case Study, **E. Moyer, J. Santner** - NKF Engineering/Packer Engineering
Paper 216: Filament Winding of Integrally Ring Stiffened Pressure Hull Cylinders, **W. Kilbourn, W. Couch** - Martin Marietta

6:00 p.m. - Cocktail Reception
7:00 p.m. - Banquet (Invited speakers: Dean H. Hines, Intermarine USA, **R. Adm. Millard S. Firebaugh**, Deputy Commander for Ship Design & Engineering, NAVSEA)

• Wednesday, Nov. 10:
8:30 a.m. - 10:00 a.m. - Session I
Testing:

Paper 117: Open
Paper 118: Use of Infrared Imaging in the Non-Destructive Inspection of Thick GRP Lamination & Ship Structures, **B. Gregory, A. Kurzweil** - CASDE/NAVSEA

Paper 217: The Development and Intended Use of the NATO Allied Naval Engineering Publication on "EMC/EMI Ship Design and Installation Criteria for Non-Metallic (GRP Ships)"

Paper 218: Fabrication Processes Under Development for Thick Composite Submarine Structures, **J. Hall, G. Leon** - G.D./Electrical Boat Division

10:15 a.m. - 11:45 a.m. - Session J
Paper 119: Blister Formation in Carbon Fiber Composite Materials Exposed to the Marine Environment, **S. Miriyala, W. Tucker, T. Rockett, R. Brown** - University of Rhode Island/NSWC

Paper 120: Use of Short Beam Shear Specimens for Quality Control of Thick Composite Structures, **J. Fogarty, R. Bohlmann, J. Kelly** - McDonnell Douglas/ARPA Maritime Systems
Paper 219: Office of Naval Research Perspectives on Composites for Marine Structures; Challenges and Current Research, **Y. Rajapakac** - Office of Naval Research

Paper 220: The Navy's Marine Composite Center, Melbourne, Fla., **J. Ray** - Great Lakes Composites Consortium

Paper 121: The Development and Intended Use of the NATO Allied Naval Engineering Publication on "EMC/EMI Ship Design and Installation Criteria for Non-Metallic (GRP Ships)"

Paper 122: The Development and Intended Use of the NATO Allied Naval Engineering Publication on "EMC/EMI Ship Design and Installation Criteria for Non-Metallic (GRP Ships)"

Paper 123: The Development and Intended Use of the NATO Allied Naval Engineering Publication on "EMC/EMI Ship Design and Installation Criteria for Non-Metallic (GRP Ships)"

Paper 124: The Development and Intended Use of the NATO Allied Naval Engineering Publication on "EMC/EMI Ship Design and Installation Criteria for Non-Metallic (GRP Ships)"

Paper 125: The Development and Intended Use of the NATO Allied Naval Engineering Publication on "EMC/EMI Ship Design and Installation Criteria for Non-Metallic (GRP Ships)"

Paper 126: The Development and Intended Use of the NATO Allied Naval Engineering Publication on "EMC/EMI Ship Design and Installation Criteria for Non-Metallic (GRP Ships)"

Paper 127: The Development and Intended Use of the NATO Allied Naval Engineering Publication on "EMC/EMI Ship Design and Installation Criteria for Non-Metallic (GRP Ships)"

Contract Awards

Yard	Vessel Name/Type/Work	Contract Amount
Bender Shipbuilding & Repair Co. (Mobile, Ala.)	SS Cape Jacob and SS Cape John/Submarines/Topside Repairs	\$1,649,648
Bethlehem Steel Corp. (Port Arthur, Texas)	SS Pioneer Crusader Submarine/Drydock Repairs	\$860,431
Braswell Services Group, Inc. (Charleston, S.C.)	USS Moosbrugger (DD 980) Submarine/Restricted Availability	\$180,557
Continental Maritime of San Diego, Inc. (San Diego, Calif.)	USS Duncan/Submarine Selected Restricted Availability	\$1,478,201
" "	USS Mahlon S. Tisdale/Submarine Selected Restricted Availability	\$1,289,902
" "	USS Sides/Submarine Selected Restricted Availability	\$2,034,749
Detyens Shipyards, Inc. (Mt. Pleasant, S.C.)	USS Halyburton Submarine/Selected Restricted Availability	\$118,748
Dreadnought Marine, Inc. (Norfolk, Va.)	USCG Mid-Period	\$96,460
General Dynamics Corp. (Groton, Conn.)	N/A/Maintenance, Repair, Alterations, Testing and Routine Work During Selected Restricted Availability	\$4,582,846
Honolulu Marine, Inc. (Honolulu, Hawaii)	USCGC Kiska Drydock and Repair	\$267,309
KMD Ship Repair of Cape Canaveral, Inc. (Cape Canaveral, Fla.)	USNS Vanguard Shell Plating Reinforcement	\$57,500
Master Marine, Inc. (Bayou La Batre, Ala.)	N/A/Repair and Overhaul	\$181,000
Metal Trades, Inc. (Hollywood, Calif.)	SS Cape Farewell Submarine/Deactivation Repairs	\$1,997,282
National Steel & Shipbuilding Co. (San Diego, Calif.)	CBE 334 & CIN 723 Regular Overhaul	\$118,748
Orange Shipbuilding Co. (Orange, Texas)	Twin-Screw Towboat Design, Construct, Test and Deliver	\$1,833,000
Promet Marine Services Corp. (East Providence, R.I.)	CT-2 POC K Drydock, Hull and Misc. Repairs and Preservation	\$119,635
San Pedro Boat Works (San Pedro, Calif.)	USS Antietam/Submarine Misc. Structure/Boat Repair	\$71,434
Service Engineering Co. (San Francisco, Calif.)	USNS Mars Post- Shipyard Availability	\$776,203

Contracts To Be Awarded

Vessel/Work	Contact
USCG Barque Eagle/Dockside Repairs	Dennis Culliton, tel: (212) 668-6273
USCG Boutwell/Dry Dock Repairs	Michael Gabisch, tel: (510) 437-3997
USS Caron/Misc. Repairs, Including Drydocking	Priscilla Tarr, tel: (804) 396-7768
David Starr Jordon Sol/Drydock and Repairs	Carl Currah, tel: (206) 526-6380
USCGC Diligence/Dockside Repair	Renee Feddern, tel: (212) 668-3375 or V. Nemara tel: (212) 668-3455
USCGC Vigilant/Drydock and Repair	Pyong N. Ko, tel: (212) 668-6271 or Michael E. Monahan, tel: (212) 668-6274
Waxahachie (YTB-814)/Misc. Topside,Bottomside Repairs	Dwight N. Jakson, tel: (808) 474-5502

Chevron Christens New Tanker, The Condoleezza Rice

Chevron's newest tanker was christened the Condoleezza Rice, after Dr. **Condoleezza Rice**, director of Chevron, in a ceremony at the Ishikawajima do Brasil Estaleiros S.A. (Ishibras) shipyard in Rio de Janeiro, Brazil.

The Condoleezza Rice is the last of three identical 136,000-dwt double-hull tankers built by Ishibras and the 10th double-hull tanker in Chevron's current fleet. It and its sisterships have a capacity to hold one million barrels of crude oil. The addition brings Chevron's total fleet to 40 ships.

Trade Delegation To Promote U.S. Equipment And Services In Middle East

The U.S. Department of Commerce will lead a Matchmaker Trade Delegation to promote U.S. Oil, Gas, & Petrochemical Equipment and Services to Kuwait City, Jeddah, Yanbu, and Dharan, January 29-February 8, 1994. Open to the first 20 qualified U.S. firms, this delegation will "match" U.S. business executives with potential agents, distributors, licensees, or joint venture partners.

Kuwait and Saudi Arabia offer excellent long-term market opportunities for American suppliers. Since Kuwait's liberation, estimated imports of oil equipment and services have totaled more than \$2 billion. The Government of Kuwait is expected to spend an additional \$6 billion before 1998. Dharan-based Saudi Aramco is in the midst of a \$24 billion expansion program. The sign-up deadline is November 23, 1993. Contact: **Pompeya Lambrecht**, Matchmaker: Kuwait and Saudi Arabia, U.S. Dept. of Commerce, 14th and Constitution, room H2012, Washington, D.C. 20230; tel: (202) 482-1794; fax: (202) 482-0178.

Alfa Laval Names Alfa Tec Distributor

Alfa Tec, Inc. of Seattle has been named the new authorized Alfa Laval distributor for the Northwest.

Alfa Tec will carry Alfa Laval's line of oil separators, plate heat exchangers, MOATTI self-cleaning filters and DESALT watermakers to customers in Washington, Oregon and Alaska. Alfa Tec is headed by **Kevin Oakley** and **John Case**, who bring many years of experience with Alfa Laval equipment to marine and specifically fishing customers in the Northwest.

For more information about Alfa Laval products,

Circle 51 on Reader Service Card

Gas Turbine-Powered Fast Ferry Aquastrada Enters Commercial Service

The Aquastrada monohull passenger ferry recently became the first gas turbine-powered fast ferry to enter commercial service. The ferry is powered by MTU combined diesel and gas turbine (CODAG) propulsion package. The Aquastrada's CODAG propulsion system includes a General Electric LM2500 aeroderivative gas turbine module, and two MTU diesel engines. During sea trials conducted in June, the ferry achieved 43 knots at 90 percent power.

"The outstanding performance of the LM2500 during the Aquastrada sea trials...further demonstrates how gas turbines are revolutionizing and gaining acceptance in the rapidly growing commercial marine propulsion market," said **John Ferrera**, GE Marine & Industrial Engines (M&I) manager of Europe, the Mideast and Africa sales and market development. The Aquastrada was built by the Rodriquez Cantieri Navali SPA shipyard in Genoa, Italy, for owner Tirrenia Lines. For more information on GE Marine & Industrial Engines,

Circle 50 on Reader Service Card

Maritime Reporter/Engineering News

Lyers Becomes Product Marketing Head Of Cablec

Cablec Continental Cables Company, a business unit of BICC Cables Corporation, has named **Dennis Lyers** director of product marketing. Cablec Continental employs approximately 600, including a nationwide sales force serving industrial and military customers throughout the U.S. with power, control, instrumentation and shipboard cable.

JSCG Veteran Felton Joins Adjusting Firm

Capt. **John R. Felton**, former Captain of the Port and pre-designated on-scene coordinator for the Puget Sound area for the U.S. Coast Guard (USCG), has joined the Marine Team of Glesy, Greer & Gunn Inc. (GGG) of Portland, Ore. Mr. **Felton** specializes in investigation of oil and hazardous material cleanup and remediation incidents, and will assist with spill cleanup management and coordination of response actions. With more than 25 years of maritime industry experience, Mr. **Felton** has served as chairman of the Port Readiness Committee for Puget Sound, as the director for the Alaska oil-spill cop SEAPRO, as a representative on American Waterways Operators' (AWO) OPA 90 task force.

Chyko Joins Folk Corp. Sales Staff

Rich Chyko has been assigned to the Pittsburgh, Pa. district office sales staff of the Falk Corp., a Milwaukee, Wis.-based subsidiary of the Sundstrand Corp. Falk is a major manufacturer of industrial power transmission machinery. In his new position, Mr. **Chyko** will join district sales manager **Gary M. Graham** in serving the company's customers in western Pennsylvania, northern West Virginia, southeastern Ohio and western Maryland.

GF Marine And Dan HVAC Enter Into Cooperation

GF Marine A/S, the Norwegian-based supplier of HVAC (Heating, Ventilation and Airconditioning) systems for marine applications, has established a close cooperation with Dan HVAC Design ApS based in Naestved, Denmark. The company's name will be changed to GF DanHVAC International A/S.

GF DanHVAC International A/S has a broad experience in design, engineering, commissioning, trouble shooting and supply of advanced HVAC systems for passenger and cruise vessels as well as ordinary cargoships and tankers. GF DanHVAC International A/S has developed well recognized products, e.g. a PPC controlled Fire Damper

System. For more information on GF DanHVAC International A/S,

Circle 40 on Reader Service Card

Gulf Copper Launches Workboat

Gulf Copper & Manufacturing Corporation launched the first of eight 50-foot steel-hulled workboats it is building under contract to the U.S. Navy at its Port Arthur, Texas facility. The Navy also exercised options for an additional ten hulls, for a total of 18 boats now under construction. The company has also reached agreement with Lykes Brothers Steamship Company for the conversion of the ex-"Thompson Lykes" into an unmanned barge. Work will include installation of new MacGregor cargo hatches, structural renovations and the addition of towing skegs and a stern notch structure for tugs. A completion date of early 1994 is projected. For more information on Gulf Copper,

Circle 48 on Reader Service Card

Austal Sells MTU-Powered Ferry To Shanghai

Austal Ships won a \$5.3 million contract to build a 131-foot aluminum passenger catamaran for the Shanghai Free Flying Transport and Yacht Co. Ltd.

It will be powered by twin MTU marine diesels driving KaMeWa waterjets through Reintjes gearboxes, for a fully laden speed of 32 knots. The 450-passenger vessel will operate a tourist service from Shanghai to neighboring islands and is scheduled for delivery in April, 1994. Austal's marketing and sales manager, **Chris Norman**, said he was confident of further sales to Shanghai ferry operators.

MarAd Cancels Qualified Bidders' List Program

The Maritime Administration has decided to drop the qualified bidders' list (QBL) pilot program for shipyards bidding to repair vessels in the Ready Reserve Force (RRF).

According to DOT Secretary **Federico Pena**, MarAd found that the QBL program did not produce the anticipated improvements in repair-work quality, was not as cost effective as MarAd had projected and did not gain industry support to the degree that MarAd had expected.

Another reason Secretary **Pena** cited for the elimination of QBL programs was the requirement by the General Accounting Office that MarAd refer cases where yards were determined not to meet the QBL standards to the Small Business Administration (SBA) for certificates of competency. The SBA would then have about three weeks to decide a case, and no limits were placed on the number of appeals that could ensue.

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Scale Model Co. Offers Professional Reproductions

Scale Reproductions is a professional scale model company based in the U.S. which has built more than 200 models for delivery worldwide. The company builds many types of models, but its specialty is marine models of all types. The models are used for office or home decor, in marketing, in prototype design presentations and as gifts.

Two years ago Scale Reproductions installed a CAD system to aid in construction of its models, and more recently the company installed a computer-controlled laser cutter which works in conjunction with the CAD systems. The new laser cutter not only provides a more accurate model, but also a shorter production time. Scale Reproductions can take a customer's blueprints, whether on paper or floppy, and create a cutting file which is used by the laser to cut the parts necessary to construct the model. For more information on Scale Reproductions, contact them at: tel: (205) 928-3892; fax: (205) 928-1859.

Hempel Pleased With New Coating's Success To Date

Since its launch in January of this year, Hempel's Combic 7199 tin-free antifouling has created extensive interest amongst owners and operators alike, and has become a worldwide success.

During the first six months, in excess of 100 vessels were protected with the product.

For additional information on Combic 7199 from Hempel,

Circle 13 on Reader Service Card

MarAd Extends Subsidizable Lives Of Four Lykes Ships

The Maritime Administration has extended for two years the subsidizable lives of four Lykes Brothers Steamship Company Vessels — the Charlotte Lykes, Margaret Lykes, Adabelle Lykes, and Sheldon Lykes. In taking this action, the Maritime Subsidy Board

noted that Lykes required a timely decision from MarAd so the company could determine whether to make a multimillion-dollar commitment for drydocking the vessels, or to solicit cargo for future voyages.

The extension of life for two years is limited to subsidy for wages, maintenance, and repair.

India's Essar May Buy Four Russian Tankers For \$208M

Talks have reportedly begun for India's Essar Shipping to purchase four 140,000-dwt tankers from Sovcomflot of Russia.

The purchase plans are part of a larger, \$460 million fleet expansion plan begun two years ago, and also part of increased recent activity by international Indian shippers after the Indian government decided to liberalize Indian shipping. Essar's plan has so far resulted in its acquisition of eight ships for \$140 million, bringing their fleet to 46 vessels. Should an agreement be reached, Essar will pay \$208 million for the tankers through its new

subsidiary, Essar Tankers.

Dresser And Baroid Form Merger Agreement

Dresser Industries, Inc. and Baroid Corporation have reached a all-stock, tax-free merger agreement which Dresser said it expects to be complete by mid-January 1994.

The transaction would exchange .40 share of Dresser common stock for each share of Baroid common stock, provided the stock values do not fluctuate significantly before the transaction, and is valued at approximately \$900 million.

Baroid, of Houston, Texas, provides specialized products and services for oil and gas exploration and production. The Dallas, Texas-based Dresser expects the merger to expand its presence in the oilfield services and equipment industry and contribute to its position as a major global supplier for oil and gas exploration, production and processing.

The boards of directors of both companies have approved the merger.

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CALENDAR

OCTOBER

Seamen's House Reception: October 13, New York Whitehall Club, New York Contact: (212) 741-9221.

International Offshore Contracting & Subsea Engineering: October 13-16, Aberdeen, U.K. Aberdeen Exhibition & Conference Center. Contact: Spearhead Exhibitions, Ltd., **Judith Patten**, Neville House, 55 Eden St., Kingston upon Thames, Surrey KT1 1BW; tel: +44 81 547 1566; fax: +44 81 547 1143.

'Oil Pollution Act of 1990: Who Will Bear the Costs of Compliance?': October 18, New York New York Athletic Club, 180 Central Park South, New York, N.Y. 10019, tel: (212) 247-5100 Contact: **Gina Pirozzi**, G. Pirozzi & Assocs., tel: (718) 858-1273; or

Joanne Pateas, Hellenic-American Chamber of Commerce, tel: (212) 269-6380.

ASNE Fleet Maintenance Symposium: October 19-21, San Diego, Calif. Contact: ASNE, 1452 Duke St., Alexandria, Va. 22314; tel: (703) 836-6727.

West European Cooperation in Marine Technology (WEMT '93): October 20-22, Madrid "Ship Production and Ship Procurement" conference. Contact: **Juan Pablo Merino**; tel: 34-1-448 4301; fax: 34-1-446 0198.

'Ports are for Everyone': October 27-29, San Diego, Calif. Contact: **DuWayne Koch** or **B.L. Edwards**, tel: (202) 504-4312.

Admiral of the Ocean Sea Awards Dinner: October 29, New York

Contact: **Barbara Yeninas** at (201) 226-8580 or **Roger Korner** at (212) 775-1033.

Human Resources in the Shipping Industry: October 31-November 5, Cambridge, England Contact: **Charlotte Baile** at Cambridge Academy of Transport; tel: +44 223-845-242.

NOVEMBER

NSRP Ship Production Symposium: November 1-4, Williamsburg, Va. Contact: NSRP Ship Production Symposium, UMTRI, Marine Systems Division, 2901 Baxter Road, Ann Arbor, Mich. 48109-2150; fax: (313) 936-1081.

ASNE Naval Engineering Symposium: November 8-10, Washington, D.C. Contact: ASNE, 1452 Duke St., Alexandria, Va. 22314; tel: (703) 836-6727.

Ship Repair & Conversion '93:

November 9-10, London, England Contact: **John Gwynn-Jones**, BML Business Meetings Ltd., 2 Station Road, Rickmansworth, Herts WD3 1QP, England; tel: +44 923 776363; fax: +44 923 777206.

Clean Seas '93: November 9-11, Valetta, Malta Mediterranean Conference Center. Contact: Spearhead Exhibitions Ltd., Mediterranean Oilfield Services Co. Ltd., Manoel Island, Malta, tel: +356 336408/9, 331411; fax: +356 339511.

Ship Structure Symposium '93: November 16-17, Arlington, Va. Sheraton National Hotel. Cosponsored by SNAME and the Ship Structure Committee. Contact: Cdr. **Stephen E. Sharpe**, Commandant (G-MI/SCC), 2100 Second St., S.W., Washington, D.C. 20593-0001; tel: (202) 267-0003; fax: (202) 267-4677.

26th Europort: November 16-20, Amsterdam RAI International Exhibition Center. Gastech RAI, Ltd.; tel: +44 71 436 9774; fax: +44 71 436 5694.

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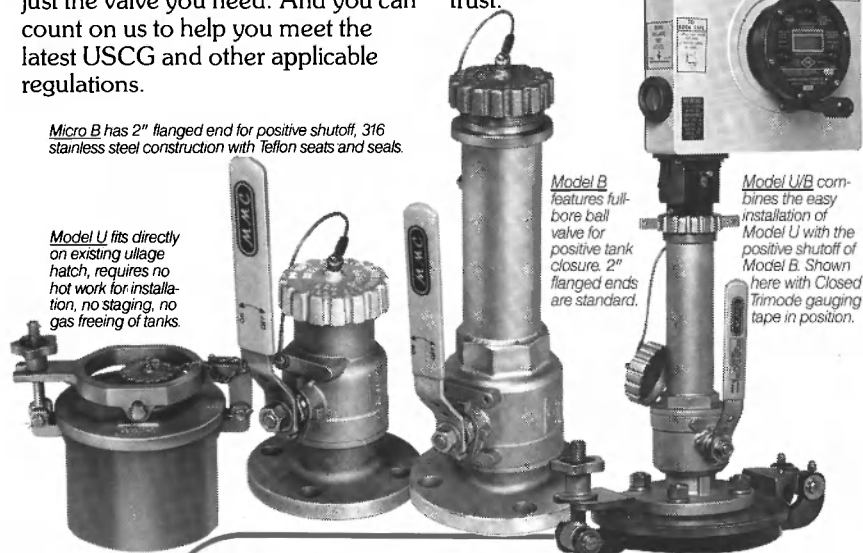
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BUYERS DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER/Engineering News. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all issues only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, EN assumes no responsibility for errors. If you are interested in having your company listed in this Buyers Directory Section, contact John C. O'Malley at (212) 477-6700.

ABRASIVES

Chesapeake Specialty Products, 5055 Northpoint Blvd., Baltimore, MD 21219
Ervin Industries, Inc., 3893 Research Park Drive, Ann Arbor, MI 48106-1668
Stan-Blast Abrasives, 3300 River Rd., P.O. Box 968, Harvey, LA 70059

ABSORBENT PRODUCTS

Haz-Maz Response Technologies, 5841 Box Canyon Rd., La Jolla, CA 92307
Sorbent Products, 645 Howard Ave., Somerset, N.J. 08873

AIR CONDITIONING AND REFRIGERATION—Repair & Installation

Adrick Marine, 141D Central Ave., Farmingdale, NY 11735
Bailey Group, 2323 Randolph Ave., Avenel, NJ 07001
Callenberg Engineering, 2010 North Miami Ave., FL 33127
Carrier Transicold, P.O. Box 4805, Syracuse, NY 13221
Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031
Stal Refrigeration AB, Butangsgatan 16, S-601 87 Norrköping, SWEDEN

BALLAST

Chesapeake Specialty Products, 5055 Northpoint Blvd., Baltimore, MD 21219
Genstar Stone Products, Executive Plaza IV, Hunt Valley, MD 21031
Mineral Research & Recovery Inc., P.O. Box 986, Sonoita, AZ 85637

BARGE BUILDING

Conrad Industries, P.O. Box 790, Morgan City LA 70381
Zidell Marine Corp., 3121 S.W. Moody Ave., Portland, OR 97201

BARGE—Leasing

McDonough Marine Service, 2300 Surekote Road, New Orleans, LA 70117
Zidell Marine Corp., 3121 S.W. Moody Ave., Portland, OR 97201

BASKET STRAINERS

Beard Industries, P.O. Box 31115, Shreveport, LA 71130

BEARING—Rubber, Metallic, Non-Metallic

B.F. Goodrich, Engineered Polymer Products, 150 Division Dr., Wilmington, NC 28401
Blohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1, GERMANY
U.S.A. Reps: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168
In-Place Machining, 1929 N. Buffum St., Milwaukee, WI 53212
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Orkot Engineering, 2535 Prairie Road-Unit D, Eugene, OR 97402
Tenmat Inc., 511 Interchange Blvd., Newark, DE 19711
Thordon Bearings Inc., 3225 Mainway, Burlington, Ont., CANADA L7M 1A6

BERYLCO SAFETY TOOLS

NGK Metals Corporation, P.O. Box 13367, Reading, PA 19612

BOAT STORAGE

Miracle Steel, Waterford Tower, Ste. 500, 503 N. Hwy 169, Minneapolis, MN 55441

BOILER—Manufacturers

Aalborg Ciser (Miami) Inc., 2449 Northeast 13th Avenue, Ft. Lauderdale, FL 33305

BROKERS

151 Maritime Services, 34062 El Encanto/B, Dana Pt. CA 92629
Captain Astad Company, Inc., P.O. Box 350486, Ft. Lauderdale, FL 33335
Emerald Yacht & Ship Brokers, 759 N. Milwaukee St., # 552, Milwaukee, WI 53202
Jack Faulkner, 2419 Caddy Lane, P.O. Box 371, Flossmoor IL 60422
Mowbray's Tug & Barge Sales Corp., 35 De Hart St., Morristown NJ 07960

BULKHEADSEALS

Blohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1, GERMANY
U.S.A. Reps: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168
John Crane Marine USA, 1536 Barclay Blvd., Buffalo Grove, IL 60089

BUNKERING

Crowley Maritime, 155 Grand Ave., Oakland, CA 94612
Zidell Marine Corp., 3121 S.W. Moody Ave., Portland, OR 97201

CELLULAR TELEPHONE SERVICE

Cellnet Corp., 400 Main St., Ste. 800, Stamford, CT 06901-3004

CHAINS

Crandall Dry Dock Engineers Inc./Marit Chain, 21 Pottery Lane, Dedham MA 02026
Milligan Marine Supply Inc., 5832 Harvey Wilson, Houston TX 77020
Washington Chain & Supply Inc., Box 3645, Seattle, WA 98124
G.J. Wortelboer Jr. B.V., Postbus 5003, 3008 AA Rotterdam, NETHERLANDS

CHAIRS

Gasser Chair Co., 4136 Loganway, Youngstown, OH 44505

CHEMICALS

Vecom USA, Inc., 236 St. George Avenue, Jefferson, LA 70121

CLAMPING—Pipe, Tubes, Hose

ZSI, 12749 Richfield Ct., Livonia, MI 48150

CLASSIFICATION SOCIETY

American Bureau of Shipping, 2 World Trade Center, 106th Fl, New York, NY 10048

COMPACTORS

A/S Vesta, Skudehavsvej 27, DK-2100 Copenhagen, DENMARK;
Sales Agents: American United Marine Corp., 5 Broadway, Rt 1, Saugus, MA 01906,

COMPOUNDS

ITW Philadelphia Resins, 130 Commerce Dr, Montgomeryville, PA 18936

COMPUTERIZED INFORMATION SYSTEMS

Autoshop Systems Corp., #403, 611 Alexander St., Vancouver, BC, Canada V6A1E1
Coastdesign, Inc., Unit 201, 12837 76th Avenue, Surrey, BC CANADA V3W 2V3
Intergraph Corporation, 2051 Mercator Drive, Reston, VA 22091-3413
Kockums Computer Systems AB, PO Box 50555, s-202 15 Malmo, SWEDEN
TIMSCO, P. O. Box 91360, Mobile AL 36691

CONDENSERS/SEPARATORS

Beard Industries Inc., P.O. Box 31115, Shreveport LA 71130
Standard Refrigeration Co., 2050 N. Ruby, Melrose Park, IL 60160
Wright Austin Co., 3250 Franklin St., Detroit MI 48207

CONTROL SYSTEM—Monitoring

ABB Industry Oy, P.O. Box 185, 00381 Helsinki, FINLAND
American United Marine Corp., 5 Broadway, Rt. 1, Saugus, MA 01906
Autronica Marine A/S, Drammensveien 126, N-0277 Oslo 2, NORWAY
Henschel, Inc., 9 Hoyt Drive, Newburyport MA 01950
IMO Industries, Gems Sensors Division, One Cowles Rd., Plainville CT 06062
MMC International, 60 Inip Dr., Inwood NY 11696
Marine Electric RPD, Inc., 50 Carol St., P.O. Box 1135, Clifton, NJ 07014-1135
Robertson Marine Systems, 3000 Kingman St., Suite 207, Metairie, LA 70006
Siemens Energy & Automation, Inc., Systems Div., Marine Systems No. America (A23N), 100 Technology Dr., Alpharetta, GA 30202
Teleflex Naval technologies, 205 Church Rd., North Wales, PA 19454

COUPLINGS

Lo-Rez Vibration Control Ltd., 156 West 8th Avenue, Vancouver, BC CANADA, V5Y 1N2
American Vulkan, P.O. Drawer 673, Winter Haven, FL 33882

CRANE—HOIST—DERRICK—WHIRLEYS

Bisso Marine Co. P.O. Box 4113, New Orleans, LA 70178
The Crosby Group, Inc., P.O. Box 3128, Tulsa OK 74101
Del Gavio Marine Hydraulics Inc., 619 Industrial Rd., Carlstadt, NJ 07072
Hagglunds Inc. Marine Div. Headq., 50 Chestnut Ridge Rd, Montvale, NJ 07645
Liebherr-Werk Nenzing GES.mbh, P.O. Box 10, A-6710 Nenzing, AUSTRIA
Marine Travellit, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
J.D. Neuhaus Hebezeug GmbH, D-5810 Witten, GERMANY

McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454

New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150

Pettibone-Tiffin Corp., 235 Miami St., Tiffin, OH 44883

Smatco Industries, P.O. Box 4036, Houma, LA 70361

Westmont Inds, 10805 Painter Ave, Santa Fe Springs, CA 90670

Zidell Explorations, Inc., 3121 SW Moody Ave., Portland OR 97201

CYLINDER LININGS

Nor Tech (USA) Inc., 21 West St., New York, NY 10006

DECK MACHINERY—Cargo Handling Equipment

MacGregor-Navire Group, 34 Bedford Rd., Clapham North, London SW4 7HH
Markey Machinery Co., Inc., P.O. Box 24788, Seattle, WA 98124-0788

McElroy Machine & Mfg. Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454

New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150

Skookum/Rope Master, P.O. Box 280, Hubbard, OR 97032

Smatco Industries, P.O. Box 4036, Houma, LA 70361

Smith Berger Marine Inc., 516 South Chicago Street, Seattle, WA 98108

Willems Pot b.v., P.O. Box 29102, 3001 GC Rotterdam, The Netherlands

DECK MACHINERY

Boatlife, 205 Sweet Hollow Road, Old Bethpage, NY 11804

McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454

New England Trawler Equipment Co., 291 Eastern Avenue, Chelsea, MA 02150

Pusnes, PO Box 102, N-4818, Faervik, NORWAY

Smatco Industries, P.O. Box 4036, Houma, LA 70361

Smith Berger Marine Inc., 516 South Chicago St., Seattle, WA 98108

DESALINATION—REVERSE OSMOSIS

Rochem Separation Systems, Inc., 3904 Del Amo Blvd., Ste. 801, Torrance, CA 90503

Rochem Separation Systems, P.O. Box 156, 54 Rue Agasse, 1211 Geneva 17, SWITZERLAND

DEPTH SOUNDING EQUIPMENT

Innerspace Technology, Inc., 36 Industrial Dr., Waldwick, NJ 07463

DIESEL ACCESSORIES

Coltec Industries Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511

Gearhardt's Inc., P.O. Box 10161, Jefferson, LA 70181

General Thermodynamics Corp., 210 South Meadow Rd., P.O. Box 1105, Plymouth, MA 02360

Kiene Diesel Accessories, 325 S. Fairbanks St., P.O. Box 386, Addison, IL 60101

Pow-R-Quik, 5518 Mitchelldale, Houston, TX 77092

DIESEL ENGINE—Spare Parts & Repair

Aalborg Ciser (Miami) Inc., 2449 Northeast 13th Avenue., Ft. Lauderdale, FL 33305

Alaska Diesel, 4420 14th Ave., NW, Seattle, WA 98107

Atlantic Yacht Sales, P.O. Box 4010, Middletown, NJ 07748

Caterpillar, Inc., Engine Div., P.O. Box 610, Mossville, IL 61552-0610

Coltec Industries, Parts & Service Div., 701 Lawton Ave., Beloit, WI 53511

John Deere, John Deere Rd., Moline, IL 61265

Giro Engineering Ltd, Talisman, Duncan Road, Park Gate, South Hampton, S03 7BX ENGLAND

Global Maritime Services, 247 SW 33 Court, Ft., Lauderdale, FL 33315

Golden Marine Company Inc., 160 Van Brunt St., Brooklyn, NY 11231

Hall-Toledo, Inc., 525 West Sophia St., Maumee, OH 43437

In-Place Machining, 1929 N. Buffum Street, Milwaukee, WI 53212

Kim Hotstart Mfg Co., E 5724 Broadway Ave., P.O. Box 42, Spokane WA 99210

Klattenberg Marine, 17 Grandview Ave., W. Orange, NJ 07052

MAN B&W Diesel AG, Stadtbachstrasse 1, D-8900 Augsburg 1, GERMANY

MAN B&W Diesel, 17 State St., New York, NY 10004

MTU of North America, 10450 Corporate Dr., Houston, TX 77478

Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, GERMANY

National Maintenance & Repair, Foot of Hawthorne, Hartford, IL 62048

New Sulzer Diesel, Inc, 200 Park Ave, New York, NY 10166

Paxman Diesels, P.O. Box 8, Paxman Works, Colchester, Essex, CO1 2HW, ENGLAND;

Paxman Diesels USA, (A Div. of Ruston Gas Turbines, Inc.), 15950 Park Row, Houston, TX 77084

Ulstein Bergen AS, PO Box 924, N5002 Bergen, NORWAY

Wartsila Diesel, 201 Defense Highway, Annapolis, MD 21401

DIVING & SALVAGE

Bisso Marine Co. P.O. Box 4113, New Orleans, LA 70178

H.J. Merrhue, P.O. Box 23123, New Orleans LA 70183

In-Place Machining, 1929 N. Buffum St., Milwaukee, WI 53212

Muldoon Marine Services, Inc., P.O. Box 3221, Terminal Island, CA 90731

DOORS—MARINE & INDUSTRIAL

Trenomat GmbH & KG, 5600 Wuppertal 11, Dompap, GERMANY

DRILLING & BLASTING

Marine Drilling & Blasting, PO Box 10455, Jacksonville, FL 32247-0455

DRY DOCKS—Design

Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381

Curacao Drydock (USA), PO Box 3012, Curacao, Netherlands Antilles

Marine Design Services, P.O. Box 928, Bonita CA 92002

North Florida Shipyards, P.O. Box 3255, Jacksonville, FL 32206

ELECTRICAL EQUIPMENT

ABB Industry Oy, P.O. Box 185, 00381 Helsinki, FINLAND

Bender Inc, 400 Gordon Dr, Bldg 501, Exton, PA 19341

Callenberg Engineering, 2010 North Miami Ave., Miami, FL 33127

L. F. Gaubert & Co., Inc., P.O. Box 50500, New Orleans LA 70150

MMC International, 60 Inip Dr., Inwood NY 11696

SPD Technologies, 13500 Roosevelt Blvd., Philadelphia PA 19116

Siemens Energy & Automation, Inc., Systems Div., Marine Systems No. America (A23N), 100 Technology Drive, Alpharetta, GA 30202

Universal Marine Electric Co., Inc., P.O. Box 266-923, Houston, TX 77027-6923

ELECTRONIC DISPLAY

High Seas Technology, Inc., 2965 West State Rd., Fort Lauderdale, FL 33312

Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolbotn, NORWAY

ELECTRONIC ENCLOSURES

A&J Manufacturing, 14131 Franklin Ave., Tustin CA 92680

ELECTRONIC INFORMATION SUPPORT

Inventory Locator Service, 3965 Mendenhall Rd. S., Suite 10, Memphis, TN 83115

Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolbotn, NORWAY

ELECTRONIC CRACKS

A & J Manufacturing Co., 14131 Franklin Ave., Tustin, CA 92680

ELECTRONIC SALES & SERVICE

Fishermans Wholesale Marine Supply Co., Inc., 4540 B. Downman Road

New Orleans, LA 70126

EMISSION CONTROLS

Haldor Topsoe Nymollevej 55, DK-2800, Lyngby, Denmark

ENGINEERING SERVICES

MCR Engineering Co., Inc. 206 Dedham St., Norfolk, MA 02056

ENGINE ROOM LIGHTING

Pauluhn Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearland, TX 77581

ENGINE TEST EQUIPMENT

General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Rd., Plymouth, MA 02360

Instruments, Computers, & Controls, Inc., 6942 Haven Creek Dr., Katy, TX 77449

EPIRBs

ACR Electronics, Inc., 5757 Ravenswood Rd., P.O. Box 5247, Ft. Lauderdale FL 33310-5247

Alden Electronics, 40 Washington St., Westborough, MA 01581

Litton Special Devices, 750 W. Sprout Road, Springfield, PA 19064

EQUIPMENT—Marine

Byrne, Rice & Turner, Inc., 1172 Camp St., New Orleans, LA 70130

Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302

EVAPORATORS

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

Beard Industries Inc., P.O. Box 31115, Shreveport, LA 71130

FANS—VENTILATORS—BLOWERS

Carling Turbine Blower Co., 8 Nebraska St., P.O. Box 15048, Worcester, MA 01615-

Jon M. Liss Associates, Inc., 411 Borel Ave., San Mateo, CA 94402

FASTENERS

Hardware Specialties, 48-75 36th St., L.I.C., NY 11101

Jamestown Distributors, 28 Narragansett Ave., P.O. Box 348, Jamestown, RI 02835

Revcar Fasteners, P.O. Box 345, Roanoke, VA 24003

Robbins Manufacturing, 1200 Airport Rd., Fall River, MA 02722

FENDERING

BF Goodrich, 150 Division Drive, Wilmington, N.C. 28401

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

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

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, NJ 07760

FIBERGLASS PIPE & FITTINGS

Ameron Fiberglass & Pipe, 61 Executive Ave., Edison, NJ 08817

FIBER OPTIC SYSTEMS

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

FIN STABILIZERS

Blohm & Voss AG, P.O. Box 10 07 20, D-2000 Hamburg 1, GERMANY;

U.S.A. Reps: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168

MARINE FIRE PROTECTION

Hiller Systems, 3710 Lakeside Court, Mobile, AL 36693

FIRE DETECTION SYSTEMS

Autronica Marine A/S, Drammensveien 126, N-0277 Oslo 2, NORWAY

EEL COOLERS

R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
 Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
 The Walter Machine Co., Inc., 84-98 Cambridge Avenue, Jersey City, NJ 07307

EAK DETECTION

U.E. Systems, 12 West Main St., Elmsford, NY 10523

JFEBOATS/RAFTS

American United Marine Corp., 5 Broadway, Rt. 1, Saugus, MA 01906
 Boston Whaler, Inc. Commercial Products Div., 1149 Hingham St., Rockland, MA 02370
 Fr. Fassmer GMBH & Co., D-2876 Beme 2, Wese, GERMANY
 Norsafe AS, P.O. Box 115, N-4818 Faevik, Norway
 Willard Marine Co., Inc., 1250 N. Grove St., Anaheim, CA 92806
 Zodiac of North America, P.O. Box 400, Stevensville, MD 21666

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
 Fishermans Wholesale Marine Supply Co., Inc. 4540 B Downman Road New Orleans, LA 70126
 Goltzen Marine, 160 Van Brunt St., Brooklyn, NY 11231
 The L.C. Doane Co., P.O. Box 975, Essex, CT 06426
 Julian A. McDermott, 1639 Stephen St., Ridgewood, NY 11385
 Nautilus Equipment Ltd., P.O. Box 66, Station M, Halifax, Nova Scotia B3J 2L4, CANADA
 Pauluhn Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearland, TX 77581
 Phoenix Products, 6161 N 64th St., Milwaukee WI 53218

LINE BLINDS

Stacey/Fetterolf, P.O. Box 103, Skippack, PA 19474

LIQUID LEVEL INDICATORS

Setcor, 2 Dean St., Tenafly, NJ 07670

LIQUID OVERFILL PROTECTION SYSTEMS

E.R.L. Marine Products, P.O. Box 1026, New Albany, IN 47151-1026

Setcor, 2 Dean St., Tenafly, NJ 07670

LOGISTICS

VL Logistics Consultants, Inc., 3420 Bienville Blvd., Ocean Springs MS 39564
 QED, 4646 N. Witchduck Road, Virginia Beach, VA 23455

LUBRICANTS

Pre-Lube, 13790 NW 4th St., Ste. 111, Ft. Lauderdale FL 33325
 B.P. Marine Americas, 200 Westlake Park Blvd., Houston, TX 77079-2682

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
 Goltzen Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231
 New England Trawler Equipment Co., 291 East Avenue, Chelsea, MA 02150

MACHINERY MONITOR AND CONTROL SYSTEMS

Electronic Marine Systems, 800 Ferndale Pl., Eahway, NJ 07065

MACHINING—On Site Repair

Global Maritime Services, 247 SW 33 Court, Ft. Lauderdale, FL 33315
 In-Place Machining, 1929 N. Buffum Street, Milwaukee, WI 53212

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., 4710 North West Second Ave., Boca Raton, FL 33431
 Marine Accommodations Inc., 8535-3 Baymeadows Rd, Ste 140, Jacksonville, FL 32256
 Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031

MARINE COATINGS

Vecom USA, 236 St. George Avenue, Jefferson, LA 70121

MARINE ELECTRONICS

High Seas Technology, Inc., 2965 West State Rd., Fort Lauderdale, FL 33312

MARINE FURNITURE

Directions In Design, 633 Emerson, Ste. 100, St. Louis MO 63141
 Engineered Data Products, P.O. Box 565, Woodbury, NJ 08906-7565
 Jamestown Metal Marine Sales, Inc., 4710 NW Second Ave, Boca Raton, FL 33431
 Marine Accommodations Inc., 8535-3 Baymeadows Rd, Ste 140, Jacksonville, FL 32256
 Maritime Services Corp., 3457 Guignard Dr., Hood River, OR 97031
 Wilson & Hayes, 1601 Eastlake Avenue, East, Seattle, WA 98102

MARINE GEARS

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

MARINE RADAR COMPONENTS

EEV, Inc., 4 Westchester Plaza, Elmsford, NY 10523

MARINE SHIP MANAGEMENT

BarbaArkton, 1810 Chapel Ave. West, Cherry Hill, NJ 08002

MARITIME EDUCATION

Seamens Church Institute, 741 Water St., New York City, NY 10038

METAL PRODUCTS

Engineered Data Products, P.O. Box 565, Woodbury, NJ 08906-7565
 Jamestown Metal Marine Sales, Inc., 4710 N.W. Second Ave., Boca Raton, FL

MULTI-CABLE PENETRATION DEVICE

NMP, 12437 E. 60th St., Tulsa, OK 74153

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS

Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Hwy., Arlington, VA 22202
 CDI Marine Co., 9487 Regency Square Blvd., Ste. 500, Jacksonville, FL 32225
 Childs Engineering Corp., Box 333, Medfield, MA 02052
 Crandall Dry Dock Engrs., Inc., 21 Pottery Ln., Dedham, MA 02026
 Crane Consultants, 15301 First Ave S., Seattle WA 98148
 C.R. Cushing, 18 Vesey St., New York, NY 10007
 Arthur D. Darden, 3200 Ridgeway Dr., Suite 403, Metairie LA 70002
 Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
 Diversified Technologies, 812 Live Oak Dr., Chesapeake VA 23320
 Encon Mgmt. & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
 GHM Inc. (Ind. Measurement Consultants), P.O. Box 1836, Newport News, VA 23601
 Gibbs & Cox, Inc., 50 West 23rd St., New York, NY 10010
 The Glosten Assoc. Inc., 600 Mutual Life Bldg., 605 First Ave., Seattle, WA 98104
 Guido Perla & Assoc., 4039 21st Ave., Ste. 300, Seattle, WA 98199
 Morris Guralnick Associates, Inc., 130 Sutter St., Ste. 400, San Francisco, CA 94104
 C. Raymond Hunt Associates, 69 Long Wharf, Boston MA 02110
 Hydrocomp, Inc., 45 James Farm-Lee, P.O. Box 865, Durham, NH 03824
 J.H. 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., Ste. 124, Miami FL 33125
 Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
 David P. Levy Enterprises, 527 Legendre Dr., Slidell, LA 70460
 MCA Engineers, Inc., 2960 Airway Ave., #A-103, Costa Mesa, CA 92626
 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 Ctr, Ste 3000, N.Y. 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 Turquois 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. Mellusi & 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 Jermantown Rd., Fairfax, VA 22030
 Olsen Marine Surveyors Co., P.O. Box 283, Fort 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 Broadway, New York, NY 10013 and 620 Fulson St., Ste. 301, San Francisco, CA 94107
 Sargent & Herkes, 225 Baronne St., Suite 1405, New Orleans LA 70112
 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. Sharp, Inc., 100 Church St., New York, NY 10007
 R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
 TIMSCO, P.O. Box 91360, Mobile AL 36691

NAVAL BOATBUILDERS

Atlantic Boat Group, Inc., 1850 Lake Park Dr., Ste. 216 Smyrna, GA 30080

NAVIGATION & COMMUNICATIONS EQUIPMENT

AT&T, High Seas Dept., 412 Kemble Ave., Room C380, Morristown, NJ 07960
 Autronica Marine A/S, Drammensveien 126, N-0277 Oslo 2, NORWAY
 Cellnet Corp, 400 Main St., Stamford, CT 06901-3004
 Comsat Maritime Services, 950 L'Enfant Plaza SW, Washington DC 20024
 C. Plath, 222 Severn Ave., Annapolis, MD 21403
 Electronic Marine Systems, 800 Ferndale Pl., Rahway, NJ 07065
 Fairide Enterprises, Inc., 2536 Sonata Dr., Columbus, OH 43209
 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 Mobile Communications, 1828 L Street NW, Suite 660, Washington, D.C. 20036
 Kenwood USA Corp., Marine Prod. Div., 2201 E. Dominguez St., Long Beach, CA 90810
 Mackay Communications, 441 US Highway #1, P.O. Box 331, Elizabeth NJ 07207
 Marine Electric RPD, Inc., 50 Carol St., P.O. Box 1135, Clifton, NJ 07014-1135
 Megapulse, Inc., 8 Preston Court, Bedford MA 01730-2380
 Nautronix, 15401 Vantage Pkwy W., Houston, TX 77032
 Norwegian Telecom, P.O. Box 6701, Oslo 1, NORWAY
 Novatech, 820 Cormorant St., Victoria, BC V8W 1R1, CANADA
 Pauluhn Electric Mfg. Co., Inc. 1616 N. Main, P.O. Box 53, Pearland, TX 77581
 Raytheon Marine Co., 46 River Road, Hudson, NH 03051
 Robertson Marine Systems, 3000 Kingman Street, Suite, 207, Metairie, LA 70006
 SPD Technologies, 13500 Roosevelt Blvd., Philadelphia, PA 19116
 Scandinavian Micro Systems P.O. Box 155, N-1411, Kolboton, NORWAY
 Simrad, 19210 33rd Avenue West, Lynnwood, WA 98036
 Sperry Marine Inc., 1070 Seminole Trail, Charlottesville VA 22901
 Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
 Summer Equipment Ltd., 24 West 4th Ave., Vancouver V5Y 1G3, CANADA
 Trimble Navigation, 585 North Mary Avenue, P.O. Box 3642, Sunnyvale, CA 94086
 Waterway Communications System, Inc. 453 E. Park Pl., Jeffersonville, IN 47130
 World Communications Sys., 11834 Canon Blvd., Newport News, VA 23606

OIL—Marine—Additives

Mobil Oil Corporation, 3225 Gallows Road, Fairfax, VA 22037-0001
 Shell Oil, P.O. Box 2463, Houston, TX 77252
 Texaco, International, 2000 Westchester Avenue, White Plains NY 10650

OIL/WATER SEPARATORS

ACS Industries, Inc., 14208 Industry Rd., Houston, TX 77053
 Alfa-Laval Separation, Inc., 955 Meams Rd., Warrminster, PA 18974-0556
 Blohm & Voss AG, P.O. Box 10 07 20, D-2000 Hamburg 1, GERMANY;
 U.S.A. Repts: Simplex-Turmar Inc., P.O. Box 168, Little Neck, NY 11363-0168
 Centrico, Inc. (Westfall Separators), 100 Fairway Court, Northvale NJ 07647
 Fast Systems, 3240 North Broadway, St. Louis, MO 63147
 MMC International, 60 Inip Dr., Inwood NY 11696
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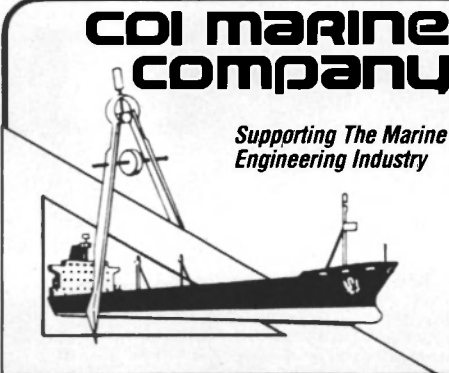
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ASTILLEROS ESPANOLAS	SHIPBUILDING	201	MMC INTERNATIONAL	VALVES	236
AUTOSHIP SYSTEMS CORP.	HULL DESIGN SYSTEMS	290	MACKAY COMMUNICATIONS	NAVIGATION COMMUNICATIONS	237
BF GOODRICH	BEARINGS	203	MACKAY COMMUNICATIONS	NAVIGATION COMMUNICATIONS	238
BARBA ARKHON	SHIP MANAGEMENT	204	MAGNAVOX	SATELLITE COMMUNICATIONS	295
BAYWOOD, INC.	MARINE EQUIPMENT	283	MARICHEM	MARITIME EXHIBITION	287
BENDER SHIPBUILDING	SHIPBUILDING	205	MARINE TRAVELIFT	CRANES/HOISTS	239
BOATLIFE/LIFE INDUSTRIES CORP.	CAULKING/ADHESIVES	294	MEGAPULSE	NAVIGATION RECEIVERS	240
CARRIER TRANSICOLD	MARINE SCREW CHILLERS	267	MICROPHOR	IBM COMPATIBLE SOFTWARE	241
CATERPILLAR	MARINE ENGINE FILTERS	206	NEWPORT NEWS SHIPBUILDING	SHIP REPAIR	244
JOHN CRANE MARINE USA	SEALS	208	NIM GROUP	WINCHES	242
CREATIVE SYSTEMS	HYDROSTATICS SOFTWARE	209	NORTH AMERICAN MARINE JET	WATER JETS	284
JOHN DEERE	DIESEL ENGINES	273	ORKOT ENGINEERING	PLASTIC COMPOSITES	245
DRMS-NSO	MARINE SURPLUS SALES	285	PETERSON BUILDERS, INC.	BOATS	289
DEL GAVIO	MARINE HYDRAULICS	210	RAYTHEON MARINE	PATHFINDER SP RADIO	246
DIESEL RESEARCH, INC.	DIESEL ENGINES & SPARE PARTS	261	ROLAND MARINE	STERN TUBE SEALERS	247
DIVERSIFIED EXPOSITIONS	WORK BOAT SHOW	211	ROYAL CHEMICAL	MARINE COATINGS	268
DIVERSIFIED TECHNOLOGIES	NAVAL ARCHITECTURE	279	SCALE REPRODUCTIONS	SCALE MODELS	248
DREW AMERIOD	SHIPBOARD PRODUCTS	212	SEA RECOVERY	WATERMARKERS	249
DUNLOP BEAUFORT	INFLATABLE RAFTS	213	KARL SENNER	PROPULSION EQUIPMENT	250
DUPONT COMPANY	ROPES/CORDS	214	SIMRAD A/S	MARINE ELECTRONICS	271
EMS	NAVIGATION COMMUNICATIONS	215	SKOOKUM/ROPEMASTER	DECK MACHINERY	291
ELTECH INTERNATIONAL	MARINE SANITATION DEVICES	216	STACEY FETTEROLF	VALVES	251
ENVIROVAC	MARINE SANITATION SYSTEMS	217	STAR CENTER	MARITIME TRAINING	270
ESGARD	BALLAST TANK COATINGS	218	STEARNS MANUFACTURING	FLOATATION & GARMET GEAR	252
FISHERMANS WHOLESALE MARINE CO.	MARINE EQUIPMENT	281	STEWART AND STEVENSON	DIESEL ENGINES	253
FLEETGUARD	MARINE FILTRATION SYSTEMS	219	SUMMER EQUIPMENT	HYDRAULIC STEERING SYSTEMS	254
FLORIDA HORIZON	LUBRICANTS	220	SWATH OCEAN	BOAT BUILDERS	277
FURUNO	COMMERCIAL RADARS	221	TELEFLEX	RMVA VALVES	255
LF GAUBERT	ELECTRIC CABLES	222	THRUSTMASTER OF TEXAS	PROPULSION EQUIPMENT	256
HARBEN	HYDRO JETTING PUMP UNIT	223	TRANTRER	HEAT EXCHANGERS	257
IDB MOBILE COMMUNICATIONS	SATELLITE COMMUNICATIONS	293	TRIMBLE NAVIGATION	GMSS	258
INNERSPACE TECH.	DEPTH SOUNDING TECHNOLOGY	224	TRINITY MARINE	SHIPBUILDING	259
INPLACE MACHINING	REPAIRS/SERVICES	288	UNITOR SHIPS SERVICE A/S	BIO-DEGRADABLE CLEANERS	282
INTERGRAPH CORP.	COMPUTER SYSTEMS	225	UNIVERSAL SHELTERS	TEMPORARY/PERMANENT SHELTERS	275
INTERNATIONAL SOS ASSISTANCE	EMERGENCY MEDICAL SERVICES	280	VIKING FENDER	FISHING GEAR	260
INVENTORY LOCATOR SERVICE	PART LOCATORS	226	VIKING LIFESAVING EQUIPMENT	INFLATABLE RAFTS	262
JASTRAM ENGINEERING	MARINE HYDRAULIC STEERING SYSTEMS	227	WARTSILLA DIESEL TAMPA	DIESEL ENGINES	274
JEAMAR WINCHES	WINCHES	228	WATERMAN SUPPLY	MARINE EQUIPMENT	263
JIMS PUMP REPAIR	PUMP REPAIR	229	WESTERN MACHINE WORKS	HYDRAULIC TOW PINS	264
KAHLENBERG BROTHERS	HORNS	230	WILLARD MARINE	RIGID INFLATABLE BOATS	265
KB ELECTRONICS LTD.	POWER CONVERSION EQUIPMENT	276	G.J. WORTELBOER B.V.	ANCHORS/CHAINS	266
KENNER TECHNICS AB	CYLINDER PRESSURE MONITORING SYS.	296	ZODIAC OF NORTH AMERICA	LIFE RAFTS	286

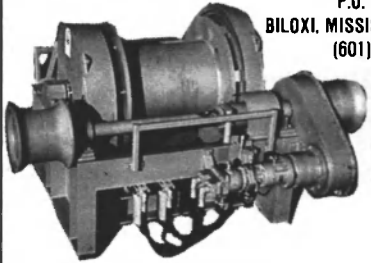
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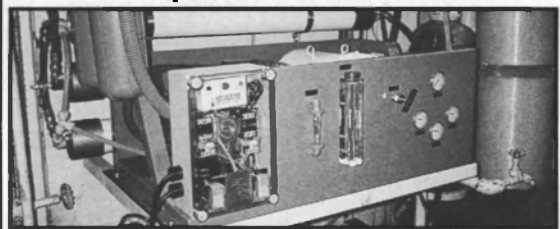
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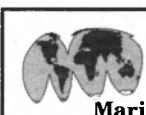
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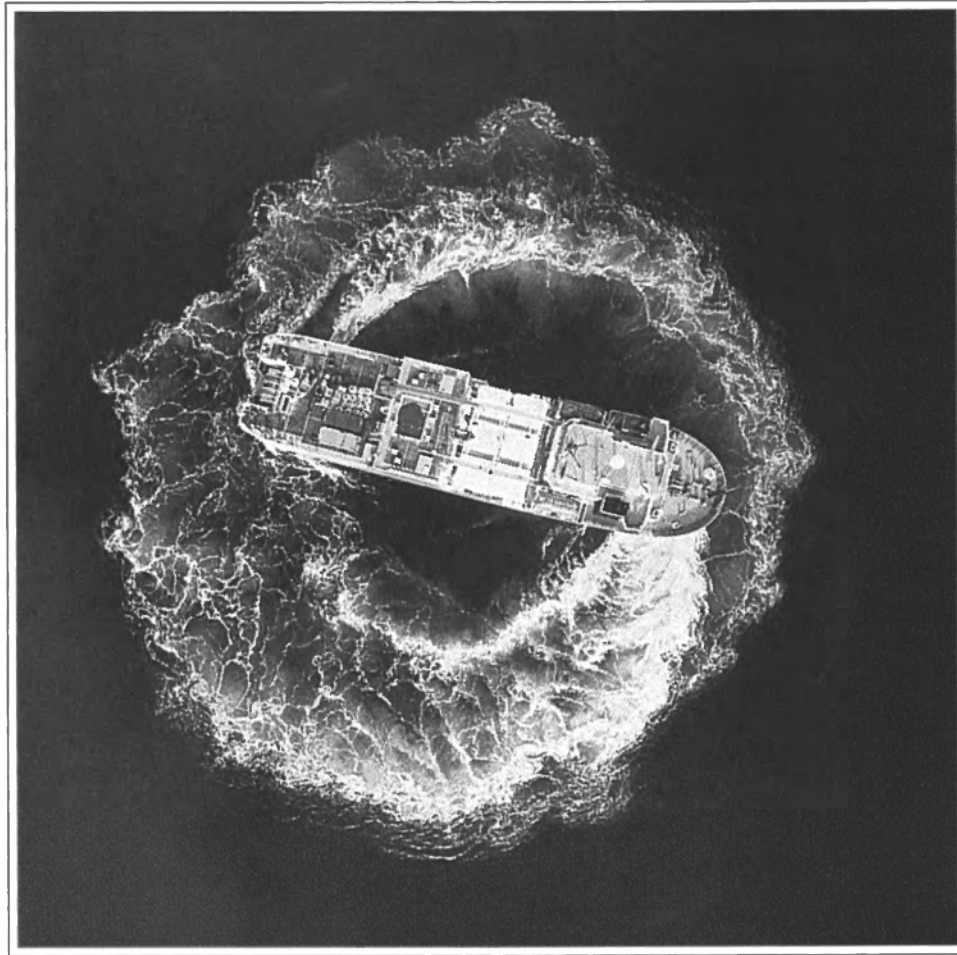
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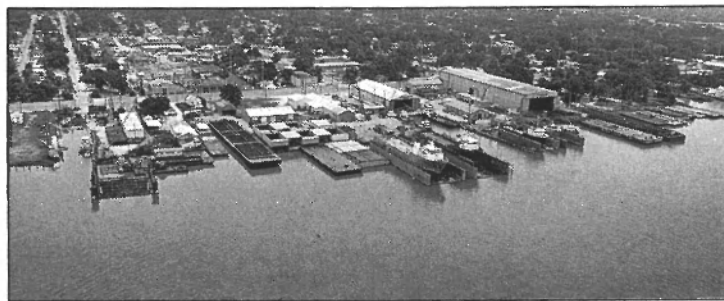
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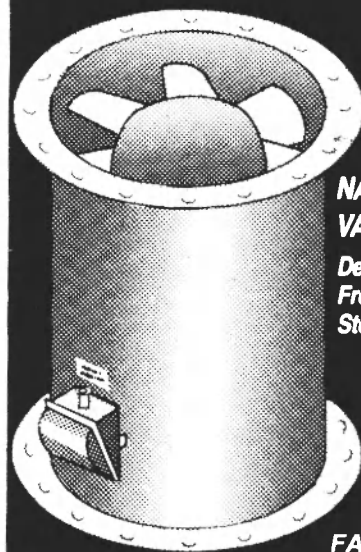
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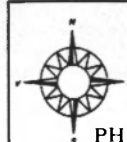
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