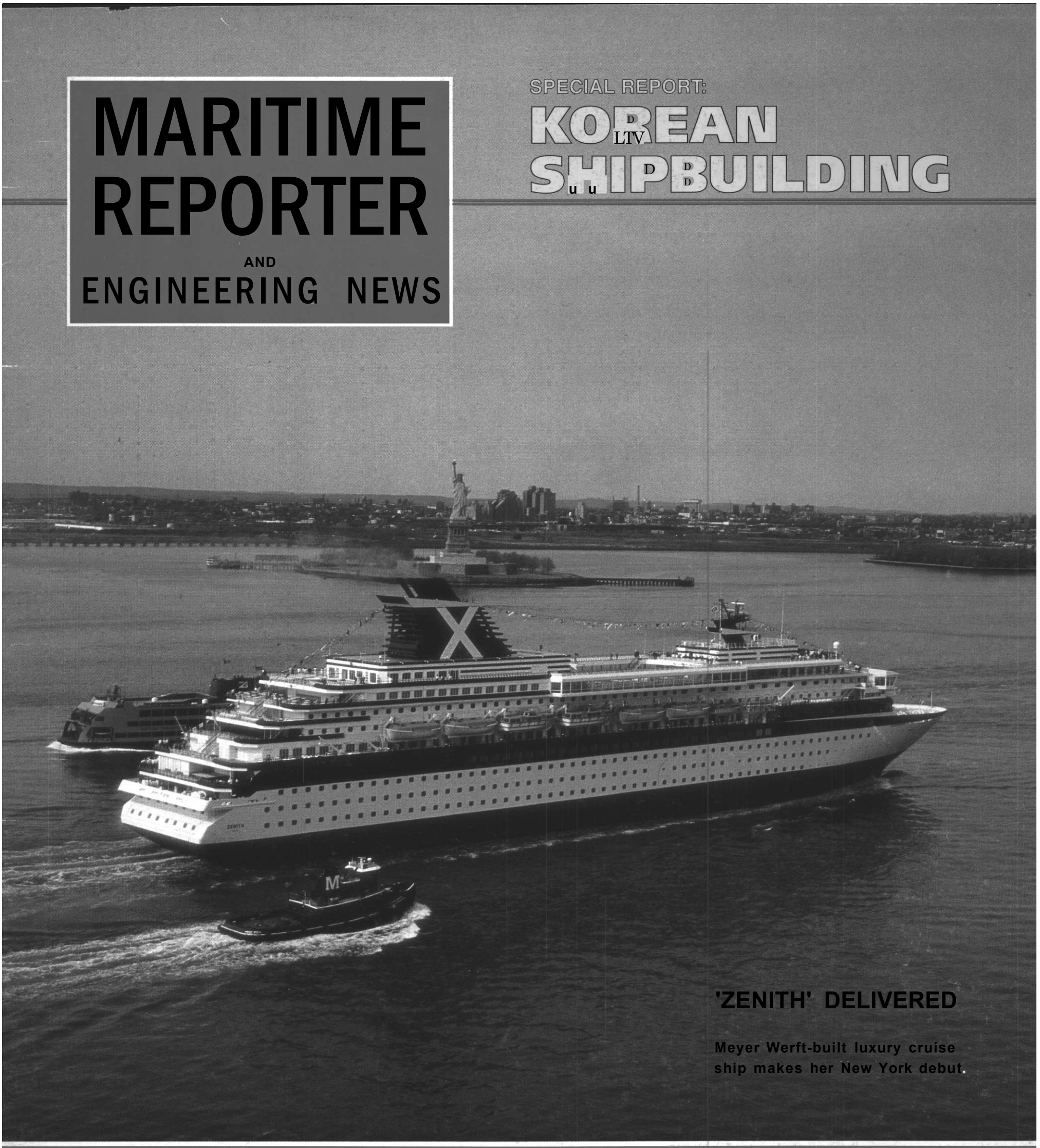
MARITIME REPORTER
AND
ENGINEERING NEWS

SPECIAL REPORT:

KOREAN SHIPBUILDING



'ZENITH' DELIVERED

Meyer Werft-built luxury cruise ship makes her New York debut.

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MAY 1992

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ON THE COVER

The 1,400-passenger M/V Zenith, built by the Papenburg, Germany, shipyard of Meyer Werft recently made her New York debut. She will sail regularly from her homeport of Fort Lauderdale on week-long cruises in the Caribbean. See story on page 29. Zenith photos and photo page 23, courtesy of Moran Towing.

INSIDE:

Fifth Superliner Ordered By CCL From Kvaerner

Finnish shipbuilder Kvaerner Masa-Yards will build a fifth superliner for Carnival Cruise Lines following the receipt of a $330 million order from the Miami-based company.

To be called the Imagination, the 70,000-grt ship will join the Carnival fleet in the fall of 1995. CCL already operates two sister vessels, the Fantasy and the Ecstasy, and has two others, the Sensation and the Fascination, on order at the Finnish yard. The Sensation will be delivered in 1993 and the Fascination in 1994.

MARITIME REPORTER and Engineering News

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White House Promises New Merchant Marine Policy

The Deputy Secretary of Transportation, **James R. Busey,** told the Connecticut Maritime Association's annual conference that a **Bush** Administration policy designed to protect the nation's merchant marine is forthcoming.

Mr. **Busey** said that one major reform being considered is the elimination of the 3-year waiting period that vessels built overseas for U.S. steamship companies must undergo before being eligible to carry government cargoes.

While stating that "U.S. carriers are strangled by archaic regulations," the former Navy admiral did guarantee White House support for the Jones Act, the 1920 law that protects domestic commercial shipping. Many free-market advocates refer to the Jones Act as outdated protectionism.

Besides saying that a new U.S. maritime policy will be formulated by a group of military and civilian officials, Mr. **Busey** would not offer any additional details.

American President Lines and Sea-Land Service Inc., the two largest U.S. container shippers, have already made it clear that they will withdraw their fleets from the U.S. flag registry unless there is a new federal maritime policy.

Noting how the **Bush** Administration's policy promise coincides with an election year, industry labor leaders are anxious to protect their membership's jobs and will support the presidential candidate with the best maritime policy. **Michael Sacco,** president of the Seafarer's International Union, said "I am not going to endorse anybody until I hear him talk about maritime."

New Quality Assurance And Environmental/Safety Directors At IMC

International Marine Carriers (IMC) has appointed **David M. Walton** as senior vice president of quality assurance, and **John O'Conner** the manager of environmental and safety control. IMC is a leading international marine transportation management and operations organization based in Mineola, N.Y., with 20 years of experience in the marine management industry.

Working with IMC's president and CEO **Robert G. Wellner** and vice president and chief operating officer **Thomas F. Keenan,** Mr. **Walton** will ensure that the company's level of shoreside and fleet management quality control, regulatory compliance and certification are maintained.

Mr. **Walton** formerly served the company as head of IMC's four Fast Sealift Ships (FSS).

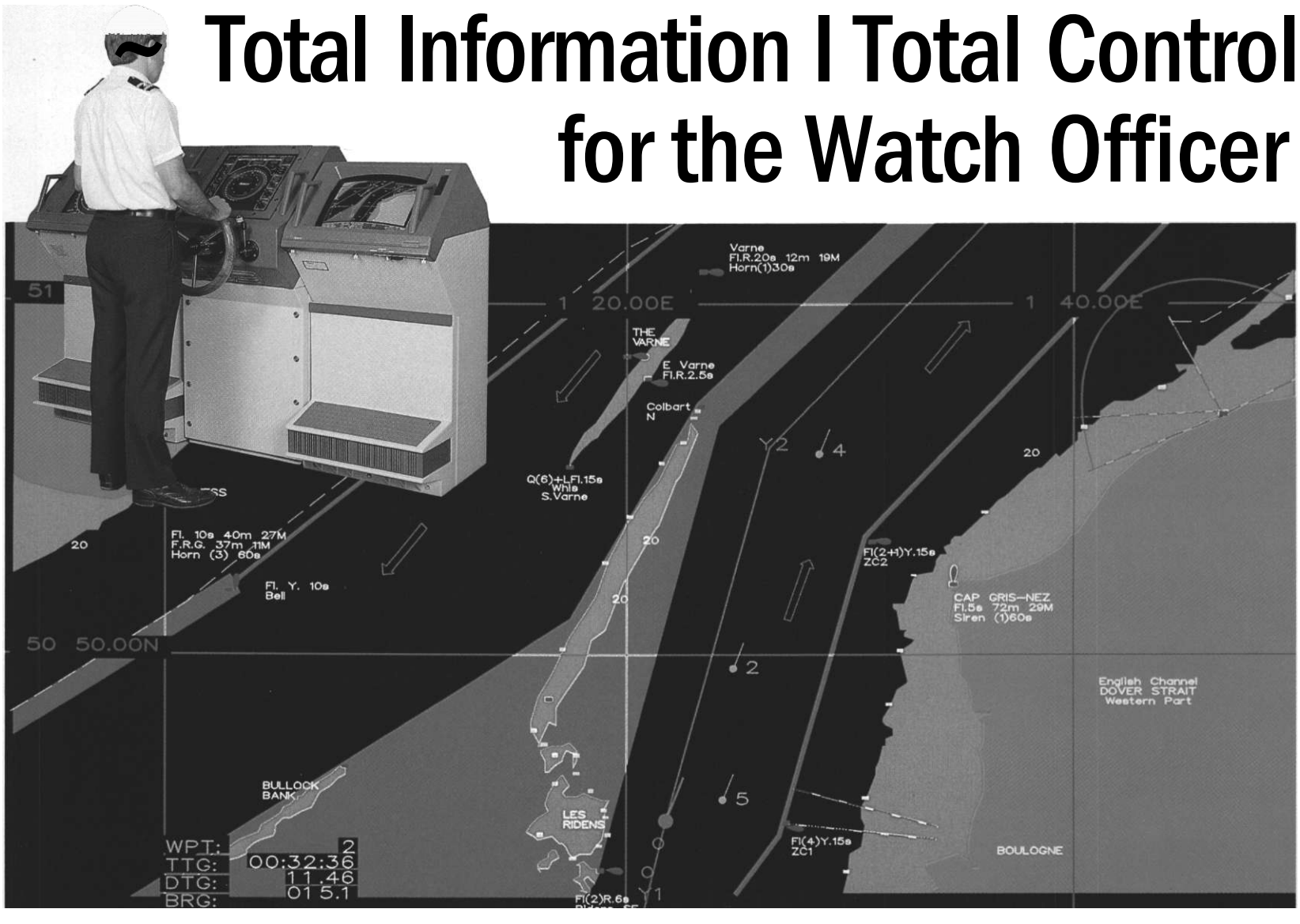
In his position as manager of environmental protection and safety, Mr. **O'Conner** will supervise and monitor all shore and ship-based programs to ensure their compliance with federal, state and local regulations.

Mr. **O'Conner** brings 14 years of sailing and marine operations experience to IMC. In addition to his Unlimited Tonnage Chief Mate's License, his background also includes developing pollution emergency response plans and the creation of pollution prevention training programs for ship and management personnel.

NASSCO Wins $2 Million Repair For Navy Cruiser

National Steel & Shipbuilding Co., San Diego, Calif., was recently awarded a $2 million contract for the selected restricted availability of the cruiser USS Chancellorsville (CG-62).

Total Information I Total Control for the Watch Officer



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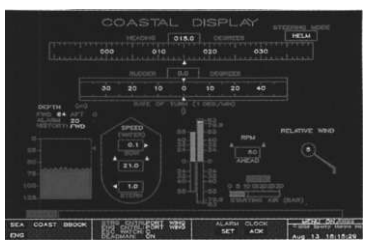
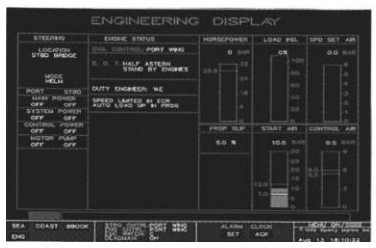


COASTAL DISPLAY



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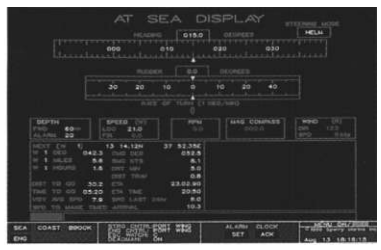

AT SEA DISPLAY

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In the Command Station, the Watch Officer has a display of ship's position on a uniform and accurate north-up electronic chart with ownship symbol, scaled to the selected chart, advancing along the displayed planned route.

The system immediately alerts the Watch Officer to any off-track condition or approach to danger areas. And, from the same command location, the Watch Officer can see ARPA targets and vectors overlaid on the chart while being able to display ARPA target data on our unique touchscreen displays.

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Circle 267 on Reader Service Card

Major Changes Predicted For World Shipping Industry

The World Freight Hong Kong exhibition was the setting for a series of conferences discussing the future of the global liner shipping industry in the next decade.

Shipping industry executives and their customers forecasted a major restructuring of the industry, with the struggle for economic efficiency being the fundamental driving force among companies.

"Within five years, I foresee only 11 mega-global carriers or consortium of carriers," stated **Conrad H. Everhard,** chairman of Cho Yang Line (USA). He said that the "almost disastrously low" liner shipping rates would eliminate weaker carriers, with only a handful of the giant multinational companies remaining.

Another interesting prediction was the disappearance of company logos from ships, with cargo pools eliminating individual company identities as a forerunner of the giant liner consortiums.

Other changes that were foreseen included: a shift in service emphasis to port-to-port operations; the end of rate-setting conferences; and the basis of container rate-setting being changed to the actual price of the cargo being transported.

MHI Introduces New Bridge Operation Support System

Mitsubishi Heavy Industries, Ltd. (MHI) recently introduced an advanced bridge operation support system called Super Bridge, which uses artificial intelligence (AI) to automatically navigate ships and prevent collisions as well as strandings and groundings. The system is expected to help reduce oil tanker accidents which can cause tremendous damage to the environment. Super Bridge also reportedly lightens the work of crews for 24-hour ocean surveillance.

Super Bridge is a more intensified version of MHI's integrated, comprehensive navigation system called Super Tonac. The fully automated monitoring and alarm systems allow for one-man bridge operation.

Super Bridge displays the ship's intended route and potentially dangerous shallow water on a CRT screen, based on data loaded into the system. The system constantly monitors movements of nearby ships in order to avoid collision. If a collision course is apparent, the system will automatically sound a warning, calculate the best course for the vessel to steer and display the course on the CRT screen. While calculating the new course, the system is also checking the depth of the water to prevent strandings or groundings.

For free literature containing complete information on Super Bridge,

Circle 107 on Reader Service Card

Industry Joint Project To Study Vertically Loaded Anchoring Systems

A joint industry study has been initiated to investigate the technical feasibility and cost requirements for vertically loaded anchoring systems for floating production platforms and other short scope mooring applications in deep water situations.

The joint project is being undertaken by Aker Omega Inc., of Houston, Stewart Technology Associates and Marine Soil Consultants to study alternative concepts to conventional pile anchors requiring expensive derrick barges for installation.

Confirmed sponsors of the project are: Amoco Production Company; Elf Petroleum, Inc.; Exxon Production Research Company; Mobil Research and Development Corp.; Norwegian Contractors and Shell Oil Company.

If any other groups or organizations are interested in joining this project, they may contact **Peter Dove** at (713) 870-1111 or by telefax at (713) 870-8008 for further information.

Comsat Develops Light-weight Satellite Battery

A new nickel-hydrogen battery technology that will double the operational life of new low earth orbit (LEO) satellite systems has been developed by Comsat Laboratories, a unit of Washington, D.C.-based Comsat Corp., and licensed to Eagle-Picher Industries, Inc.

The new Common Pressure Vessel (CPV) will result in significant size and weight savings over the existing Individual Pressure Vessel (IPV), pioneered by Comsat Labs and also previously licensed to Eagle-Picher.

The CPV will allow a communication satellites in LEO to carry an additional payload or extend its operational life. Enhanced thermal performance will allow greater depth of discharge and a lighter battery, increasing the satellite's useful life by more than 100 percent.

Eagle-Picher, of Cincinatti, currently maintains 90 percent of the world's nickel-hydrogen battery market.

For more information regarding the Comsat CPV battery,

Circle 33 on Reader Service Card

Underwriters Told To Oppose Foreign Insurance Protectionism

A senior official from the U.S. Trade Representative's Office told the American Institute of Marine Underwriters that it has neglected its responsibility to help fight foreign restrictions on American marine cargo insurance.

David Beebe, chairman of the institute representing 90 percent of the nation's marine insurers, pointed out recently that there is no reference in bilateral trade agreements to granting free access to the international cargo business to U.S. marine underwriters.

The U.S. Trade Office is willing to include this provision for the country's marine insurers in bilateral trade agreements, but "it takes two to tango, and we can't solve the problem by ourselves," said the trade office official. He added that the institute has yet to adequately identify to the trade office those countries that possess restrictive cargo insurance policies or to form delegations to meet with foreign officials on the subject.

Fore River Yard Site Of $ 1.6-Billion Boston Project

As part of an effort by the Massachusetts Water Resources Authority (MWRA) to rejuvenate Boston Harbor, the Quincy shipyard, renamed the Fore River Staging Area, will be the site of a $6.1-billion redevelopment project.

In 1987 the MWRA purchased the 180-acre Fore River shipyard from General Dynamics, who operated the facility after acquiring it from Bethlehem Steel in 1964.

An $87-million sludge treatment plant that opened at Fore River in 1991 will end decades of dumping shipyard sewage into the harbor, making "an enormous difference in the quality of Boston Harbor," said **Douglas B. MacDonald,** executive director of the MWRA. Almost 70 tons of sludge a day is processed into fertilizer and then shipped by railroad for distribution.

Contractors are using 60 acres of Fore River as a heavy equipment and materials staging area. Trucks carrying the equipment use one of two roll-on/roll-off piers to board barges for Deer Island, the principle construction site for the harbor project.

In addition to being a support base for the Boston Harbor cleanup, the Massachusetts Shipbuilders Corporation (MSC) have teamed with AK Engineering to revive ship repair and building at the old Quincy shipyard. Of the 70 acres set aside for shipbuilding, 15 acres are currently in use, said **Maggie Debbie,** MWRA development manager. The shipbuilders have repaired or decommissioned four vessels that were used in the Gulf War.

Overlay Finish For Fiber Ropes Improves Marine Performance

Military specifications for fiber ropes are now going to include a finish requirement to improve the rope's performance in the marine environment.

Where included in the specifications, rope manufacturers must use fibers with an overlay finish to ensure that their products provide superior performance in a marine environment, as compared, that is, to ropes made of fibers without an overlay finish. Major fiber producers and some manufacturers have developed these marine overlay finishes which generally include lubricants that are combined with other additives in proprietary formulas.

"Our SeaGard[R] over finish is an important part of improving the performance of cordage," said **Earl B. Clark,** regional sales manager, Allied Signal, Inc., Industrial Fibers Division. "We are continually striving to come up with the optimum fiber finish that rope manufacturers can translate into performance ropes.

"Furthermore, the government has recently recognized the success of an over finish on nylon and polyester ropes in the commercial fishing, pleasure and industrial marine areas. And, new government specifications are now being drawn up regarding all types of braided and twisted nylon and polyester ropes," he stated.

Another major producer of overlay finish products is E.I. Du Pontde Nemours & Co. (Inc.) Industrial Fibers, which offers these types of fibers as part of its "Performance Plus" line.

"Finishes have been one of the most important factors in the processibility and performance of synthetic fibers since their earliest days," said **William Huffacker,** account manager for the Wilmington, Delaware company's industrial products division.

"Du Pont is continually working to have available the right finish for the right application. In the case of fibers for many rope applications, it was determined that a secondary or overlay finish was very useful and such finishes have been a major factor in our portfolio of industrial fibers for over 20 years," he continued.

According to the data yielded by laboratory testing and actual marine applications, the specially treated fiber ropes can provide a significant increase in abrasion resistance, higher wet strength retention and longer overall life, when used in normal operations. It is not possible, however, to establish a specific life cycle because there is a wide variety in the storage circumstances and conditions of use of fiber ropes used in marine operations. Because of this, requirements for a specific protection period are not being included in military specifications.

Marine overlay finishes are now available for use on high tenacity nylon, polyester and aramid fibers used in stranded, braided and wire-lay type constructions. Rope manufacturers should be contacted for the physical properties of their ropes with these finishes, along with recommendations on working loads. Manufacturers names are listed in the Cordage Institute Directory. To obtain a copy of the directory plus information from Allied Signal and Du Pont,

Circle 111 on Reader Service Card

Freeport Shipbuilding Awarded Contract To Build Passenger Vessel

Freeport Shipbuilding and Marine Repair, Inc., was recently awarded the contract to build the 150-passenger vessel, Barefoot Princess, for Charleston Paddlewheel Company, Inc. of Myrtle Beach, S.C.

The Barefoot Princess will be 65 feet long with a beam of 26 feet. The sidewheeler replica is financed by Caterpillar Financial and will be powered by twin Caterpillar 3208 diesel engines and a 40-kw generator.

Scheduled to be delivered in June, the Barefoot Princess will operate as a sight-seeing and dinner/cocktail cruise vessel.

Freeport Shipbuilding and Marine Repair has been designing and building U.S. Coast Guard approved passenger vessels, as well as custom, luxury yachts and houseboats. Located in Northwest Florida, the company provides year-round shipbuilding and repair services.

For further information about the services and facilities provided by Freeport Shipbuilding,

Circle 64 on Reader Service Card

Key figures in Ryan Marine's Army LCM refit program (left to right): **Brian Cosse,** Ryan ship superintendent, **Ed Lackey,** vice president-program management, **Glenn Ward,** U.S. Army Surveyor.

Army Takes Delivery Of Landing Craft From Ryan Marine

In conjunction with the U.S. Army's LCM-8 modernization program, Ryan Marine, Inc., of Pearlington, Mississippi, recently delivered a refitted LCM-8 to Fort Eustis, Virginia. This was the third LCM revitalization project completed by Ryan in 18 months..

The Mississippi facility is certified for all types of government and commercial repair work and new construction. The Ryan yard utilizes a 130-ton syncrolift system and a 900-ton floating drydock.

For free literature on Ryan Marine,

Circle 42 on Reader Service Card

MagneTek's PCB Testing Ensures EPA Compliance

The testing of Polychlorinated Biphenyls (PCB's) has become an important consideration for electrical equipment and environmental managers because of strict Environmental Protection Agency (EPA) regulations. MagneTek, of Louisville, Ohio, offers an extensive PCB testing program, from the field sampling of electrical equipment insulating fluid to the disposal of samples at EPA approved facilities. Test samples can also be mailed-in to the company for analysis.

PCB contamination level testing is the first step in identifying regulatory requirements for maintenance, repair, record keeping and disposal. Awareness of contamination levels also gives managers the ability to make reliable decisions regarding repair/replacement or disposal due to equipment failure or oil spill.

The manufacturing arm of MagneTek, based in Los Angeles, produces electrical products and services including: lighting ballasts and transformers; motors and controls; electronic adjustable frequency drives; power conversion systems; large special motors (to 30,000 hp) and generators; and power transformers to 100 megawatts. MagneTek also repairs and rebuilds motors, generators and transformers for utility and industrial customers.

For free literature detailing MagneTek's various services,

Circle 44 on Reader Service Card

Tomlinson Appointed Commodity Sales Director At Crowley Maritime Corp.

John Philip Tomlinson was recently appointed to the position of director, commodity sales, liner services division, for Crowley Maritime Corporation. The announcement was made by **Dave Miskowiec,** Crowley's area manager, commodity sales.

Mr. **Tomlinson** will be responsible for major refrigerated and tobacco accounts, as well as overseeing sales programs, marketing and coordination with operations personnel.

Mr. **Tomlinson** has been working in the industry for 10 years and has a background in sales management for shipping companies, as well as for a port authority, a stevedoring/terminal operator and a steamship agency.

Air Ride Craft Introduces New 'Dual-Air' CAT/SES

Air Ride Craft, Inc. of Miami, Fla., recently introduced its new "Dual-Air" CAT/SES design. The design combines catamaran and SES technology to yield an efficient yet simple high-speed marine craft.

Some of the reported advantages of the design are: 1) moderate cost, 2) 40-50 percent less high speed resistance than a catamaran or a monohull, 3) no flexible seals, 4) 35 percent less "hump" drag than an SES, 5) none of the air cushion bounce normally associated with the SES, 6) a simple trim and pitch control system that functions by controlling fore and aft air cushion pressures in each sidehull, and 7) a unique rapid attachment docking system (RADS).

"Dual-Air" craft from 43 feet to 328 feet have been designed. Some of the uses for this design would be for motor yachts, commercial ferries and crewboats, long range fishing vessels and military craft.

For free literature detailing the new "Dual-Air" design from Air Ride Craft,

Circle 69 on Reader Service Card

Singapore Begins Ship News Telex Service

Singapore Telecom and the Singapore Marine Department recently installed a shipping news telex system which is effective within 400 nautical miles of the republic. The system, which requires that ships be equipped with a Navtex receiver, will allow vessels to monitor weather, shipping conditions and other hazards.

A reported advantage to the system is that the radio officer will not have to sit and listen to the news, but will be able to read a printout of the information in English.

The system is set up conforming to the International Convention for Safety of Life at Sea.

The information will be broadcast six times a day in 10-minute blocks. Voice radio and Morse code will be phased out by August 1,1993, according to the Singapore Marine Department.

For further information,

Circle 62 on Reader Service Card

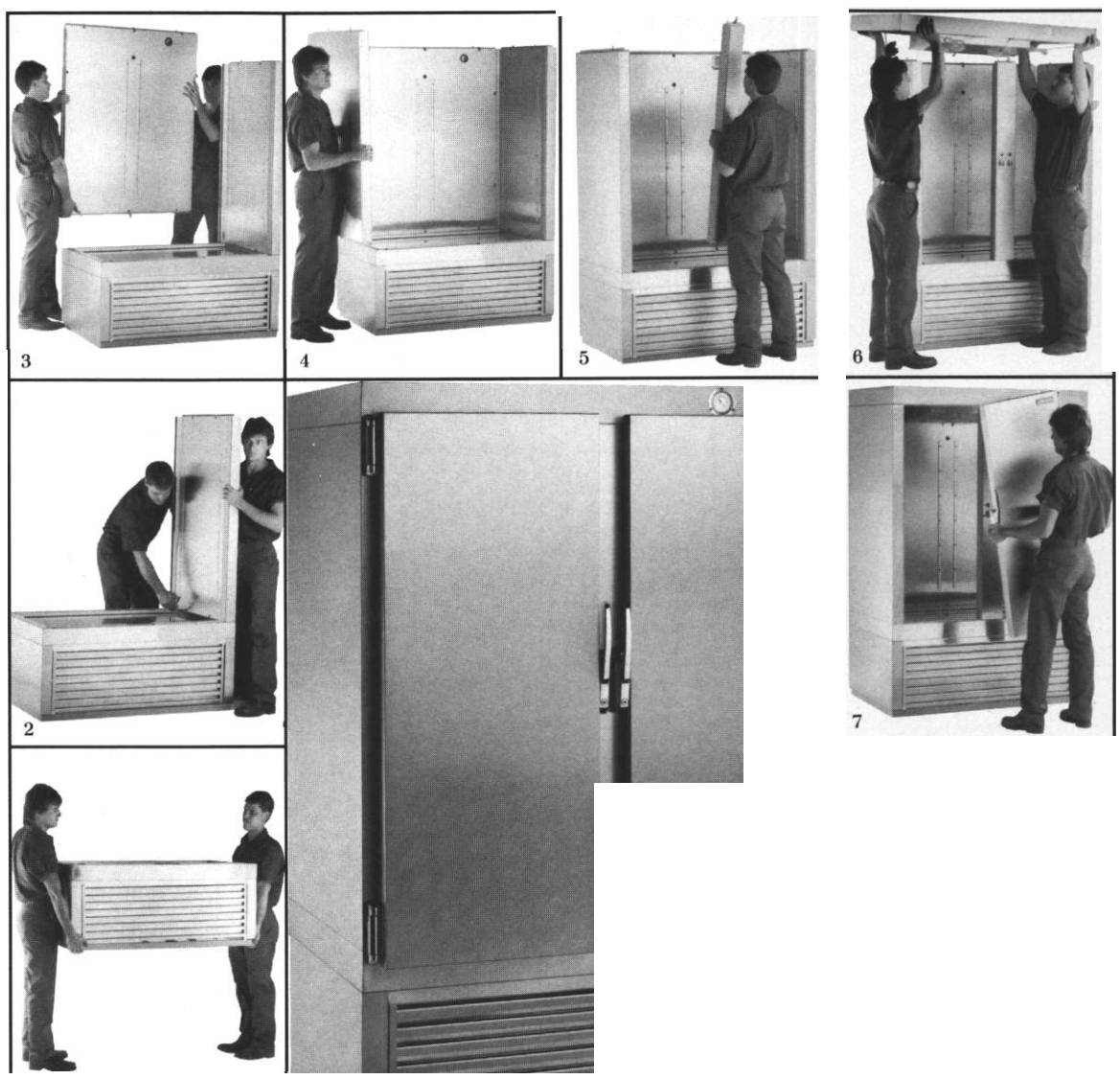
India Suspends Coastal Shipping Law To Attract Foreign Shipping Lines

India has decided to suspend its coastal shipping law for another five years in order to attract foreign carriers to its ports. This decision was made in spite of the lack of response from the carriers during the one-year trial of the suspension. During the trial, the Surface Transport Ministry would allow foreign carriers to use Indian ports for transshipment as long as permission was granted and the carrier could guarantee a minimum increase in container traffic.

The Surface Transport Ministry hopes that the five-year suspension will cause foreign carriers to use Indian ports for transshipment, attract more vessels to India and speed up exports because cargo is presently being transshipped through ports in other countries.

In the past, coastal trade was limited to Indian carriers only.

Key figures in Ryan Marine's Army LCM refit program (left to right): **Brian Cosse,** Ryan ship superintendent, **Ed Lackey,** vice president-program management, **Glenn Ward,** U.S. Army Surveyor.



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India Suspends Coastal Shipping Law To Attract Foreign Shipping Lines

India has decided to suspend its coastal shipping law for another five years in order to attract foreign carriers to its ports. This decision was made in spite of the lack of response from the carriers during the one-year trial of the suspension. During the trial, the Surface Transport Ministry would allow foreign carriers to use Indian ports for transshipment as long as permission was granted and the carrier could guarantee a minimum increase in container traffic.

The Surface Transport Ministry hopes that the five-year suspension will cause foreign carriers to use Indian ports for transshipment, attract more vessels to India and speed up exports because cargo is presently being transshipped through ports in other countries.

In the past, coastal trade was limited to Indian carriers only.

Government And Oil Industry Begin Battle Over Oil Spill Assessments

The National Oceanic and Atmospheric Administration (NOAA) has fired the first round in the potentially long and bitter battle over oil spill damage assessment between the U.S. government and the oil transport industry.

NOAA has recently published its attempt to formulate a logical set of rules on oil spill assessment in an advanced notice of proposed rulemaking in the Federal Register. The cornerstone of NOAA's controversial policy is its recommended use of the contingent valuation methodology (CVM) to calculate the value of a particular resource to individuals who do not use or plan to use it. In simpler terms, CVM can be used to assess the damage caused by an oil spill to the public's general welfare.

While NOAA and several environmental groups believe that CVM is the only logical answer to accurate oil spill damage assessment, the oil transport industry sees it as yet another government-sponsored penalty resulting from the Oil Pollution Act of 1990.

Fuel Surcharge Reduced By Mideast Rate Group

Reflecting lower calender quarter fuel prices, the West Coast/ Middle East Rate Agreement has lowered its cargo fuel surcharges.

The rate group that services the liner trade between Middle Eastern and U.S. West Coast ports consists of three intermodal carriers, American President Lines Ltd., Sea-Land Services Inc. and Maersk Line Ltd.

The new group surcharges are: $20 per 40- or 45-foot container; $16 per 20-foot container; $1 per metric ton of weight-rated cargo; $1 per cubic foot of measure-rated cargo, and; $1 per metric ton of all other cargo.

Bids On US Oil Reserve Rejected By DOE

All the bids recently received by the U.S. Department of Energy (DOE) on crude oil from the Elk Hills Naval Petroleum Reserve have been rejected by the agency for being too low.

The 19 bids on the 53,740 barrels a day of crude ranged from $ 11.71 to $14.06 a barrel, said the DOE.

The oil was to have been sold under a six-month contract from April 1 to October 1, but the DOE will instead re-auction the crude while its current purchase contracts are extended through the end of April.

NAVIONICS Introduces New Micro Chart Module

One of the world's largest manufacturers of professional natical electronic charts, NAVIONICS, of Woods Hole, has developed a new credit card-size electronic chart module called the NAVIONICS Microchart. The Microchart uses the latest memory card technology and employs "flash memory" devices which consume little power and require no batteries. Several of the world's leading marine electronics equipment companies are utilizing the Microchart in their new product lines.

The Microchart combines a large 128 MB memory storage facility that is the equivalent to hundreds of navigational charts, with the fast data access that is essential to safe navigation.

NAVIONICS electronic charts are now available in either cartridge or Microchart format starting at $150. The company reports that its seamless database of over 6,000 navigational charts is the largest in the world.

For free literature containing full information on NAVIONICS products,

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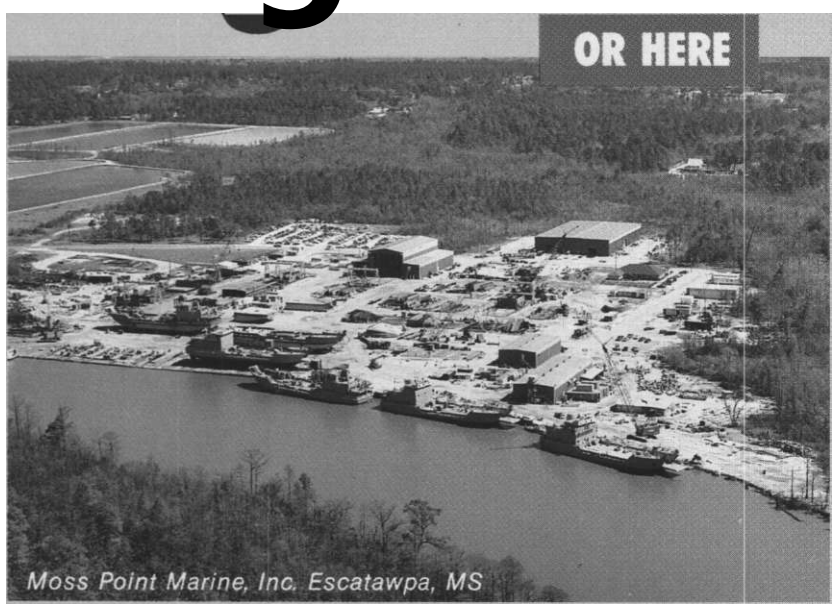

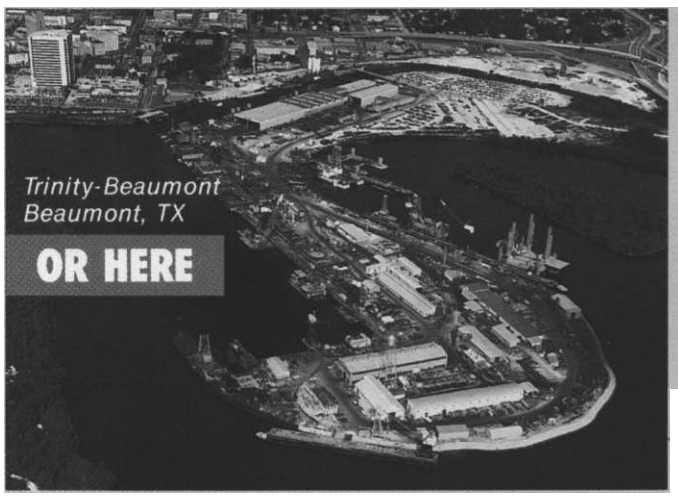

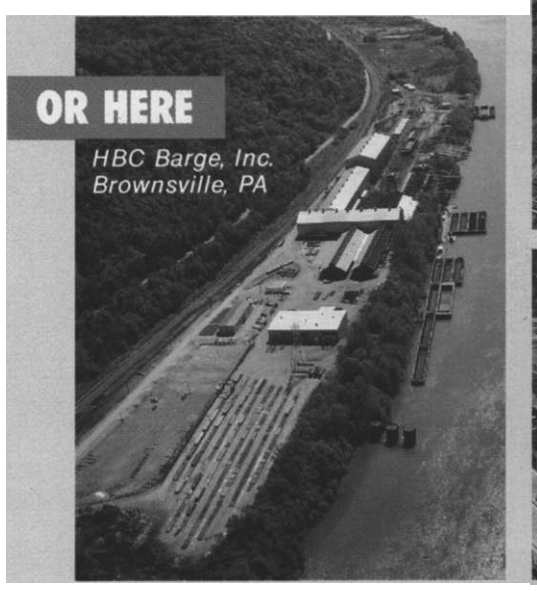

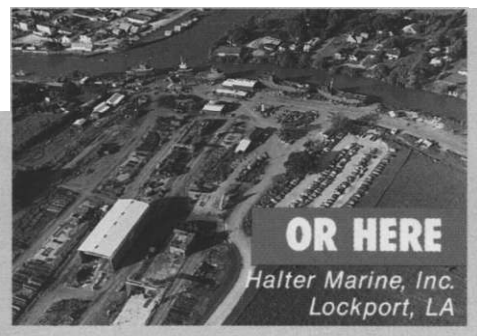

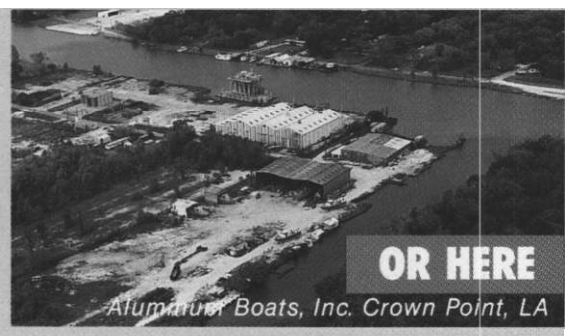

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Inland Port Opened By Philadelphia

In an attempt to tap into the Port of Baltimore's export business, the Philadelphia Regional Port Authority has recently opened its new inland port.

Baltimore offers shippers some major advantages when compared to Philadelphia. The Port of Baltimore is physically closer to the key industrial city of Pittsburgh and trucks hauling cargo from Pennsylvania to Baltimore use toll-free interstates, while Philadelphia traffic must use the Pennsylvania Turnpike.

To counter this, the Philadelphia Port Authority is offering virtually to subsidize trucking costs by guaranteeing that shipping costs for cargo coming into the Delaware River port will not exceed the cost of using Baltimore.

Bill McLaughlin, director of communications for the Philadelphia Port Authority, stated that the port expects to lose money on the arrangement at first, in exchange for the long-term gain of establishing a strong customer base.

Riverboat Sought For Alabama Town

The tourism board for Gadsden, Ala., is seeking a riverboat to operate on the Coosa River.

According to **Lloyd Wagnon,** executive director of the Gadsden-Etowah Tourism Board, Gadsden is the county seat of Etowah County, which has a population of 100,000 and is the locus of a growing tourist industry in northeast Alabama. Mr. **Wagnon** says the board will help promote a riverboat operation.

For further details, contact Mr. **Wagnon** at (205) 549-0351, or write to: Box 8267, 1500 Noccalua Road, Gadsden, Ala. 35902-8267.

Hagglunds Denison Names Controls Unlimited As Marine Service Center

Controls Unlimited Inc., Long Beach, Calif., has been named as an authorized service, repair and remanufacturing center by Hagglunds Denison for its line of marine hydraulic products.

Hagglunds Denison manufactures hydraulic components and systems for construction vehicles; mining equipment; pulp and paper, chemical, and other processing equipment; ships and ordnance equipment; and for machine tools, plastic molding, die casters and stamping presses.

For further information,

Circle 51 on Reader Service Card

IMC Announces New Board Of Directors, Corporate Officers

The president and CEO of International Marine Carriers, Inc. (IMC), **Robert** G. **Wellner,** recently announced that the company has experienced a complete change in its board of directors and corporate officers. Mr. **Wellner** will be chairman of the board and other members include: **Thomas F. Keenan, David M. Walton, Robert J. Young** and **Vincent J. Barra.** The new corporate officers include: Mr. **Keenan** as vice president and chief operations officer, Mr. **Barra** as secretary and **John V. Fougner** as treasurer. Mr. **Walton** will be vice president, quality assurance, and Mr. **Young** will be vice president engineering.

IMC was founded in 1980 and presently manages a fleet of 16 vessels, including RO/ROs, LASH vessels, tankers, car/truck carriers and container/crane ships. IMC's management experience includes both U.S.- and foreign-flag ships in seagoing and shore-based activities.

For further information,

Circle 50 on Reader Service Card

"Engineer a better fiber, and ultimately you ve engineered a better product."

Because of the challenge faced by rope, cordage and fiber manufacturers — to construct a better polyester product for the wet environment — engineers at Allied-Signal Inc. were persistent until they discovered a solution — SeaGard®. The motivation for this was a basic part of the Allied Fibers philosophy: "engineer a better fiber, and ultimately you've engineered a better product". By utilizing Allied Fibers' high tenacity ACE polyester and then applying the SeaGard finish to the 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, many 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 & distribution (T&D) lines. ACE polyester SeaGard meets these requirements. And, for the sailor who wants Ihe 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 Street, New York, NY 10001.

Allied Fibers

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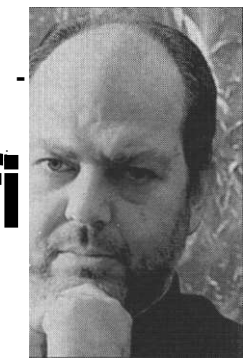
Allied Signal

AESA Appoints Gonzalez-Sama General Commercial Manager



Jose Carlos Gonzalez-Sama

Astilleros Espanoles SA (AESA) recently announced that **Jose Carlos Gonzalez-Sama,** naval architect and marine engineer, has been appointed general commercial manager of the company and its group of companies.

The nomination of Mr. **Gonzalez-Sama** was proposed by **Juan Saez,** chairman of AESA, to the board of directors and confirmed by the shareholder, the state-owned Instituto Nacional de Industria (INI), to take over from **Luis Vilches.**

As general commercial manager, Mr. **Gonzalez-Sama** will be in charge of the commercial policy of the company and its group, including sales, marketing, promotion and advertising. Included in the AESA group of companies are Astano, Astander, Barreras and Juliana.

Prior to assuming his new position, Mr. **Gonzalez-Sama** was the current newbuildings division manager of AESA and its group since 1987.

Mr. **Gonzalez-Sama** has a long career in the commercial shipbuilding industry. Before joining AESA, he was commercial deputy director and later director of Construnaves, the Spanish association of shipbuilders.

Keppel To Raise Cash For Expansion Of Asian Activities

Singapore's Keppel Corporation recently announced it would raise as much as $123 million through a rights issue to shareholders in order to finance expansion plans throughout Asia and perhaps other areas.

Keppel's subsidiaries and affiliates include Keppel Shipyard Ltd.; Far East Levingston Shipbuilding Ltd. (FELS); Keppel Philippine Shipyard Inc.; Singmarine Industries Ltd.; and Amfels Inc.

The company also holds interests in Chokani Dockyard in India and Arab Heavy Industries Ltd. in Oman.

Keppel is competing for a Sri Lankan dockyard, and is also interested in the Subic Bay Naval Base, which the U.S. will be leaving this year. The firm also is involved in a vessel building joint venture with a Vietnamese consortium.

RCCL May Build Another Ship As Result Of Expansion Program

Royal Caribbean Cruise Line recently announced that it may build more ships as a result of the completion of a $900 million expansion program.

It is reported that the company is considering a design that is about 131 feet shorter and about 19,000 tons lighter than its new ship, Majesty of the Seas, being built by Chantiers de l'Atlantique at St. Nazaire.

Outboard profile drawing of a new 210-foot casino boat under construction at Service Marine Industries, Inc.

Service Marine To Build HarrahVHammons Casino Boat For Illinois Operation

Gambling Vessel Part Of $36 Million Project

The Morgan City, La., shipyard of Service Marine Industries Inc. is constructing a new 210-foot gaming boat for a Harrah's Casino Hotels/ Hammons partnership as part of a $36 million gambling project.

The megayacht-style vessel is being built for the Des Plaines Development Limited Partnership of Joliet, 111., and will begin offering gaming cruises on the Des Plaines River through downtown Joliet in the spring of 1993.

The new casino boat is designed as a Subchapter H vessel with U.S. Coast Guard certification for 1,200 passengers operating on a protected water route. She will reportedly be the first Midwest casino vessel operated by a national casino company. Owners of the vessel are a partnership composed of Harrah's Casino Hotels and **John Q. Hammons,** a major developer, owner and operator of hotel properties.

Founded in 1937, Harrah's is the gaming subsidiary of The Promus Companies, Incorporated of Memphis, Tenn., and the only casino company operating in all five major U.S. casino markets. Harrah's is the 80 percent general partner and Mr. **Hammons** is the 20 percent limited partner in the venture. Besides the casino boat, the $36 million project will include the construction of land-based buildings and a ship basin in downtown Joliet.

The casino will be located on three decks offering approximately 700 gaming positions, including 500 slot machines and 30 table games. The casino will be served by two elevators and stairways. In addition to gaming space, the new boat will feature a large dining area forward on the first deck and a lounge at the forward end of the second deck. The focal point of the vessel will be an atrium open to all three decks.

The vessel will be on a "fast track" construction, according to **Tom Hensley,** vice president of marketing for Service Marine. "We have contracted to deliver this boat at our shipyard in January 1993," he said. "Marine engineering is proceeding at a rapid pace. Structural drawings for the hull are complete and construction has started."

Marine engineering is being performed by DeJong & Lebet, naval architects from Jacksonville, Fla.

Service Marine Industries, Inc., recently delivered a 600-passenger, 187-foot dinner boat to Spirit Cruises of Norfolk, Va., the fourth such vessel the company has built for this customer. Additionally, the yard has received another order for a 200-foot, 800-passenger dinner/ excursion boat from Premier Yachts of Chicago. Service Marine also has four paddlewheel-style and three yacht-style casino vessel designs, ranging in size from 645 to 1,600 gaming positions.

For free literature detailing the boatbuilding capabilities of Service Marine Industries,

Circle 21 on Reader Service Card

Ship Repair Revival Plan Outlined By San Francisco

As part of a seven-point plan to revive San Francisco's ship repair industry, an amendment has been added to the city's municipal code which would make local ship repairers exempt from payroll taxes.

Because of this new amendment, the Golden Gate Ship Repair Association has received a $500,000 payroll tax exemption which will be in effect from July 1, 1992 and continue until June 30, 1994.

The amendment to the code states that any tenant of the Port whose principal business is ship repair and whose workforce is comprised of at least 30 percent of San Francisco residents is exempt from the tax. This also applies to subcontractors who receive 70 percent of their revenues from the ship repair industry, and whose workforce consists of 30 percent San Francisco residents.

Carl Hanson, president of the Association and senior vice president and general manager of Southwest Marine, a local repairer, has been instrumental in bringing together city officials, the Port of San Francisco, ship repair executives and labor representatives in an effort to revive the Bay Area ship repair industry.

Once a booming local industry with 10 facilities employing over 20,000 workers, San Francisco's ship repair sector has only two remaining yards—Southwest Marine and Service Engineering, who currently have a combined workforce of approximately 800.

Det Norske Veritas Research Project On Bulker Safety

In light of recent concern over bulk carrier losses, Det norske Veritas, the Norwegian classification society, will perform full scale measurements on a Cape-size vessel managed by Anglo-Eastern Ship Management Ltd. of Hong Kong. The goal of the project is to collect reliable information on actual stress levels of a typical bulk carrier during trading, including loading/unloading and bad weather conditions; to use this information to evaluate present design criteria for new bulk carriers; and to evaluate the need for changes in operating practices. The actual data will be compared to numerical models for analysis.

The project has been spurred by concern over the loss of more than 300 lives and two million tons of cargo in incidents involving almost 40 bulk carriers over a three-year period running from May 1988 to April 1991.

Bay City Marine To Deactivate Frigate

Bay City Marine, National City, Calif., will deactivate the USS Downes (FF-1070) under a $539,671 contract.

Schichau Seebeckwerft Launches First Of Two Great White Fleet Reefers

Schichau Seebeckwerft AG recently launched the first of two reefer ships it is currently building for Great White Fleet (United Brands/ Chiquita) at its yard in Bremerhaven. The ships are the first of this type being built at the yard of which four have already been built and delivered by Bremer Vulkan AG.

The vessel is 513.6 feet long, 75.5 feet wide and has a draft of about 23 feet when fully loaded. The ship has a 6,300-dwt capacity. Container capacity on deck is 46,43-foot units, or 48, 40-foot units, and cargo hold capacity is 91, 40-foot units.

Power for propulsion is provided by one Bremer Vulkan MAN B&W 7L60MC diesel engine with a maximum continuous output of 16,520 bhp. Design speed, when fully loaded, is about 21.35 knots.

For further information about the services and facilities of Schichau Seebeckwerft,

Circle 61 on Reader Service Card

Del Norte Introduces Model 2006 GPS Receiver

Del Norte Technology Inc., Euless, Texas, has introduced the Model 2006 GPS system, one of the latest additions to its GPS product line.

The 2006 is a 6-channel LI C/A code GPS receiver which comes with a built-in PC and rugged splash-proof case. The system allows for flexible data logging and processing capabilities for almost any application. The system was designed primarily as a differential GPS mobile station.

Included with the system is a built-in LCD display, support for external monitors, six user-configurable RS 232 serial ports for flexible communications, internal logging memory and a 3.5-inch floppy disk drive.

Also included is a software package for navigation and guidance, helmsman graphics, and user-selectable interfaces for a wide range of depth sounders.

Del Norte has been in business for over 23 years and its products are marketed worldwide through 12 service centers.

For more information detailing the Model 2006 GPS system,

Circle 63 on Reader Service Card

M/V Sam Houston Work Completed At John Bludworth Marine

The M/V Sam Houston recently underwent its quadrennial dry dock inspection and repairs at John Bludworth Marine. The inspection and tour vessel belongs to the Port of Houston Authority.

The Sam Houston, which was taken out of service in January, was hauled out, scrubbed and coated. The vessel also underwent other maintenance and inspection procedures, including having the bottom of the vessel audio-gauged.

For more information detailing the services of John Bludworth Marine,

Circle 108 on Reader Service Card

17th Ticonderoga Class Cruiser Christened At Ingalls Shipbuilding

The 17th of 19 Ticonderoga (CG-47) Class of Aegis guided missile cruisers was recently christened during a public ceremony at Ingalls Shipbuilding division of Litton. The vessel was christened Cape St. George.

The vessel is 567-feet long and is designed to provide primary protection for the Navy's battle fleets. The vessel is equipped with the Aegis Combat System, the heart of the ship's war fighting capability.

Ingalls has already delivered 15 Aegis cruisers to the Navy and 41 other warships since 1975.

For further information about the services and facilities provided by Ingalls Shipbuilding,

Circle 65 on Reader Service Card

New Report Offers Detailed Study Of World Reefer Shipping

In their recent report, "Reefer Shipping - Global Prospects For Refrigerated Cargo Shipping And Trade To 2005," Drewry Shipping Consultants Ltd., London, seeks to provide cargo owners and ship operators with highly detailed and organized data that identifies market trends in refrigerated cargo to the year 2005.

To explain why there can often be wide variations in revenues during the trading year, "Reefer Shipping" evaluates such factors as: break-bulk, palletized and container shipping; liner versus non-liner; high and low-volume months and seasons; and frozen and, chilled cargo.

Up-to-date profiles on the dozen major refrigerated cargo players are also provided. Drewry states that they have provided detailed information describing the current fleets, spheres of operation and market roles for the Americans, British, Danish, Dutch, German, Greek, Japanese, South African and Swedish reefer shipping interests.

The report offers an overview of the reefer market, including an appraisal of reefership economics and the costs of refrigerated transport. It examines trends in newbuilt ship prices, world fleet composition and capacity through the year 2005, owner's operating costs and typical fuel/port expenses in an effort to compare and contrast costs profiles for different ships and fruit trades.

The Reefer Shipping report is published by Drewry Shipping Consultants, Ltd., 11 Heron Quay, London E14 4JF, United Kingdom, price approximately $600 (350 Pounds Sterling) post-paid.

For further information or to request a copy of the report, contact **Peter Rowbotham** in the U.K. at: Telephone: 071-987-9396 Fax: 071-987-9396 (telephone from the U.S., 011-44-71-987-9396).

R.H. Wager Opens New Mobile Office And Product Lines

Michael Wager, president and chief executive officer of Robert H. Wager Company, Inc., announced the opening of a southern regional office in Mobile. Mr. **Wager** also said that the new director of sales and marketing for the southern regional office will be **Nathan Coarsey.**

The company's corporate offices are in Rural Hall, North Carolina, and its western regional office is located in Newport Beach, California.

The Wager Company manufacturers a well-known line of marine products including: inverted vent check valves, deck drains, and tank air escape valves. In addition to being the sole national distributor of Tapley brake testing meters, Wager also handles Copes feed water regulators, desuperheaters and valves and Vulcan soot blowers.

Wager is starting several new lines of equipment that it will be distributing throughout states in the U.S. Gulf area. These new items include: NIBCO butterfly and ball valves, Merit brass pipe, tubing and fittings, Potter-Roemer hose valves, caps and adapters, Fairbanks iron and brass valves, Lee Silbraze fittings and flanges, and Mueller butterfly valves and strainers.

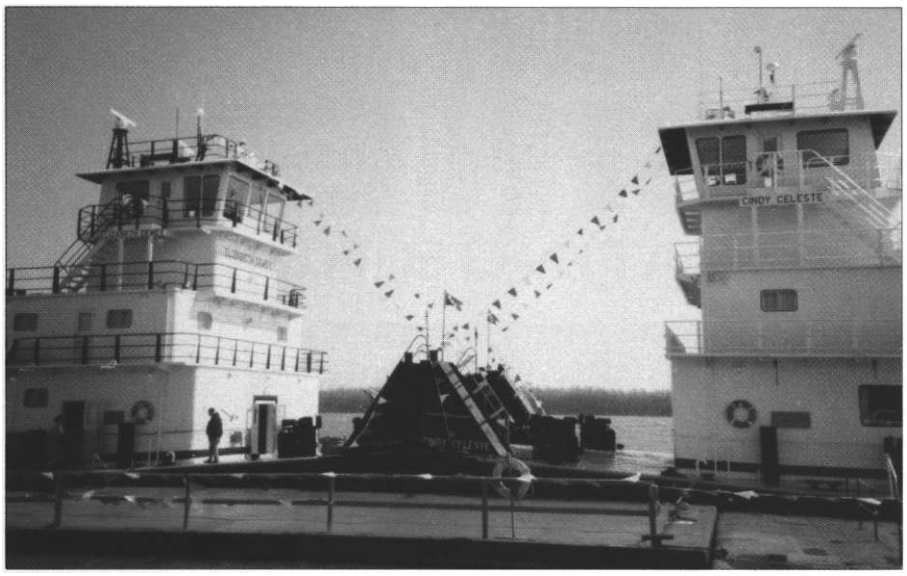
For free literature on the products manufactured and distributed by Robert H. Wager Company, Inc.,

Circle 43 on Reader Service Card

Non-OPEC Members Urged To Slow Oil Production In Saturated Market

The Venezuelan Minister of Energy and Mines, **Alirio Parra,** has asked the nations outside of the Organization of Petroleum Exporting Countries (OPEC) to help an already saturated oil market by reducing their levels of production.

Last February, OPEC reduced its total production ceiling to 22.98 million barrels a day, with almost 90 percent of member nations complying with the organization's decision, according to Mr. **Parra.**



National Marine's M/V Elizabeth Dewey and M/V Cindy Celeste bow-to-bow on the Ohio River prior to christening ceremonies.

Double Christening Held For Avondale-Built National Marine Towboats

Over 500 Attend Ceremonies For Viking Maritec-Designed Boats

The second and third of a series of three Viking 2000 Class towboats built by the Boat Division of Avondale Industries, Inc., were recently christened in ceremonies on the Ohio River at Paducah, Ky.

The 168-foot-long boats were named the M/V Elizabeth Dewey, operated by Western Kentucky Navigation, Inc., and M/V Cindy Celeste, operated by B&H Towing, Inc. Both Paducah companies have long-term operating agreements with owner National Marine, Inc. of New Orleans.

The two vessels are already in service barging mixed cargoes on the Mississippi and other inland waters.

More than 500 people attended the double christening of the Viking 2000 Class towboats on the Ohio River in Paducah, Ky.

The first of the class, the Karen K., is being operated by the Stokes Towing Company, Inc., Greenville, Miss.

Sponsors of the M/V Cindy Celeste were **Cynthia Helen Lay** and **Jennifer Celeste Lay,** daughters of B&H Towing president **Buck Lay.** The M/V Elizabeth Dewey was christened by **Elizabeth Marie Dewey,** daughter of Western Kentucky Navigation president **David Dewey.**

More than 500 people were in attendance at the dual christening, which was presided over by **John P. O'Toole,** president of Viking Maritec, Inc. Other principals in attendance included: **Barry Heaps,** vice president and manager at Avondale Boat Division; **Dominic Verona,** president of National Marine, Inc., **Joseph J. Keppel,** president and chief executive officer of the Ventura Group; Comdr. **Jack Burri,** U.S. Coast Guard; and Mr. **Lay** and Mr. **Dewey.**

Built at a cost of about $7 million each, the Cindy Celeste and the Elizabeth Dewey, along with their sister Karen K, were designed by Viking Maritec, Inc., Oakdale, Pa., an affiliate of the Vectura Group of companies. Viking Maritec, which holds all the design and proprietary rights of Dravo Marine Equipment Co., has constructed over 8,000 hulls, about 5,000 of which are still in service.

Mr. **Verona** said of the two new towboats, "They are everything we thought they'd be on paper. They were well-designed and engineered by Viking. They have exceeded our expectations."

Propulsion for the twin-screw Viking 2000 Class towboats is supplied by a pair of Caterpillar 3612 diesels, rated at 6,800 hp at 900 rpm. The twin Cats drive two kort nozzled five-blade variable-pitch stainless steel propellers via Reintjes WAV 4450 marine gears. Karl Senner, Inc., New Orleans, supplied the Reintjes reverse reduction gears with internal hydraulic propeller shaft brakes and two Rexroth pneumatic remote control systems.

Auxiliary power is provided by two 165-kw Caterpillar SR-4 generators driven by Caterpillar 3306Ts supplied by Beckwith Machinery Co.

A unique feature of the Viking 2000 Class is its vibration isolated upperdeck and pilothouse, which offers the crew a more comfortable ride and reduces stress on sensitive communication and navigation systems. Viking Maritec reports that the Viking 2000 Class design offers the advantages of reduced lube oil consumption, 50,000 hours before engine overhaul, full ahead to full astern in "eight seconds flat," and a large potable water capacity.

For free literature detailing the boatbuilding services of Avondale Boat Division,

Circle 113 on Reader Service Card

For further information on the design services of Viking Maritec,

Circle 114 on Reader Service Card

ELIZABETH DEWEY/ CINDY CELESTE Equipment List

Main engines (2) ..	Caterpillar
Propellers	Avondale
Generators	Caterpillar
Generator engines	Caterpillar
Reduction gears...	Reintjes
Engine controls....	Rexroth
Capstans	Schoellhorn Albrecht
Deck winches	NABRIC0
Coatings	.... International Paint
VHF radio, SSB radio	IC0M
Radar	Furuno
Pumps	Ingersoll Rand
Separator	Alfa Laval
Autopilot	Radio Zeeland
Steering controls .	Control General
Fuel monitoring....	.... Phoenix Fuel Sys.
GPS	Qualcom

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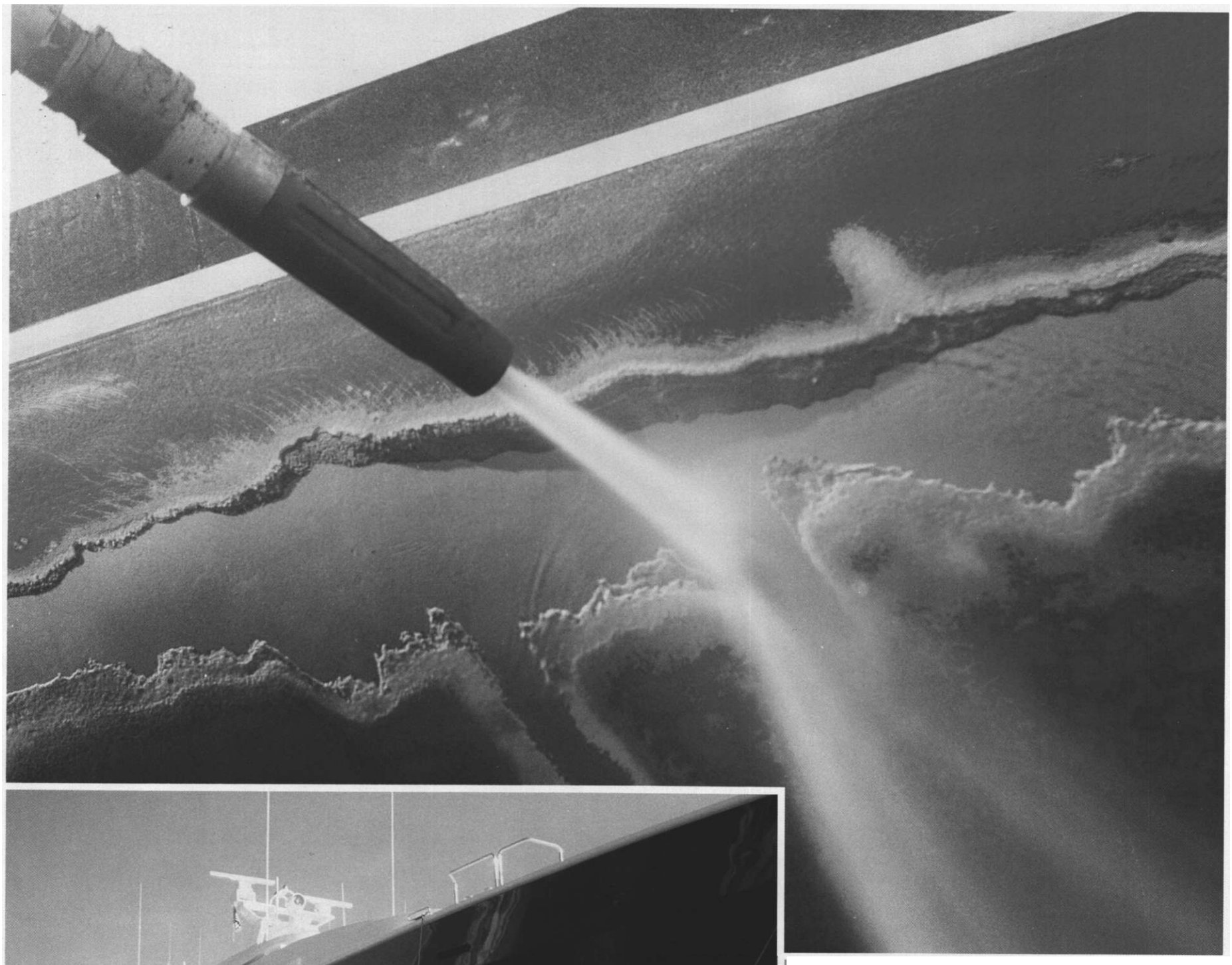

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Circle 230 on Reader Service Card 24

DOUBLE HULL UPDATE

By Comdr. Peter A. Popko, USCG
and
Stephen M. Shapiro*

New international standards for double hull oil tanker construction were recently adopted at the 32nd session of the Marine Environment Protection Committee (MEPC 32) of the International Maritime Organization (IMO), a United Nations agency responsible for maritime affairs. U.S. Coast Guard Rear Adm. **A.E. (Gene) Henn,** Chief of the Office of Marine Safety, Security, and Environmental Protection, serving as the head of the U.S. delegation to MEPC 32, stated that the U.S. fully supported the principles embodied in regulations 13F (new tankers) and 13G (existing tankers) because they were the same principles contained in the Oil Pollution Act of 1990 (OPA 90).

However, since there were technical differences between regulations 13F and 13G, and the requirements of OPA 90, the U.S reserved its position on adoption of these amendments to the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

Under the provisions of Article 16 of MARPOL 73/78, these amendments will enter into force on July 6, 1993, unless more than one-third of the parties to MARPOL 73/78 object to the amendments by January 6, 1993. The Coast Guard is currently reviewing and evaluating possible courses of action with regard to these amendments.

Scheduled to be published in late spring, the U.S. double-hull regulations will provide standards consistent with those agreed to at MEPC 32, but will apply them as required by OPA 90. They will appear as an interim final rule (IFR) rather than a final rule to allow for further public comment. The IFR will not foreclose options with respect to final U.S. action on the amendments adopted at IMO. Additionally, it will not contain any provisions for alternatives or equivalents to double hulls, since they are not presently permitted under OPA 90.

OPA 90 requires a double hull to be fitted on each vessel, including foreign ships, carrying oil in bulk as cargo or cargo residue in U.S. waters. Any such vessel (with some specific exceptions) that is constructed or that undergoes a major conversion under a contract placed on or after June 30, 1990, must have a double hull fitted at the time of construction or major conversion. Starting in 1995, an existing vessel must be fitted with a double hull in accordance with a timetable in OPA 90.

The recently delivered double-hulled crude tanker Patriot on her first cargo trip to New York. She is the first of four 95,000-dwt tankers being built by Samsung Heavy Industries of South Korea for Conoco Shipping of Houston.

MARPOL-OPA 90 Regulational Differences For New Oil Tankers

There are major differences between MARPOL regulation 13F for new oil tankers and OPA 90. They are:

(A) Regulation 13F applies to oil tankers of 600 dwt and above; OPA 90 applies to any tank vessel regardless of tonnage.

(B) Regulation 13F applies to oil tankers contracted on or after July 6,1993, or delivered on or after July 6,1996; OPA 90 applies to new tank vessels contracted for on or after June 30, 1990, or delivered on or after January 1, 1994.

(C) Regulation 13F allows for dispensation from the double-bottom portion of the double hull if the oil tanker is built with a mid-deck in the cargo tanks; OPA 90 provides no dispensation from the double-hull requirement.

(D) Regulation 13F allows oil tankers less than 5,000 dwt to have a double bottom and small cargo tanks in lieu of a double hull; OPA 90 requires all tank vessels regardless of size to have a double hull.

MARPOL-OPA 90 Regulational Differences For Existing Tankers

In addition, there are major differences between regulation 13G for existing oil tankers and OPA. They are:

(A) Regulation 13G applies to crude oil tankers of 20,000 dwt and above, and product carriers of30,000 dwt and above; OPA 90 applies to any tank vessel regardless of tonnage.

(B) Regulation 13G requires the phasing out of existing single-hull tankers after 30 years' service; OPA requires phasing out based on a detailed schedule which ranges from as late as 45 years' service to as early as 20 years' service. The resulting effect of this difference is that larger, newer tank vessels are required to have a double hull sooner under OPA 90, while smaller, older oil tankers are required to have a double hull sooner under regulation 13G. There are approximately 40 U.S. oil tankers that would be required to have a double hull sooner under regulation 13G than under OPA 90.

Mid-Deck Studied

The mid-deck design included in regulation 13F as an alternative to double hulls is one of the technical differences which has caused the Coast Guard to reserve its position. Since MEPC 31 in July 1991, the U.S. has clearly voiced an objection to the mid-deck design, stating that an alternative needs to be proven before it is accepted by the MEPC [there are no mid-deck designed tankers under construction or in operation at present]. As a result, IMO agreed to undertake a study to compare the environmental performance of double hull and mid-deck tankers, and to evaluate guidelines that would be used for approval of other possible alternative designs. The Coast Guard was an active participant on the IMO Steering Committee for this study with the main objective of insuring that the study be fair and equitable. In their report, the Steering Committee

concluded that when considering total oil outflow, the mid-deck design is equivalent to the double hull. The U.S. reserved its position on this conclusion in the Steering Committee and later at MEPC 32.

OPA requires the Coast Guard to determine whether other structural and operational tank vessel requirements would provide protection to the marine environment, equal to or greater than provided by double hulls. It further requires the Coast Guard to report to Congress its determination and recommendations for legislative action. To fulfill these obligations, the Coast Guard commissioned the National Academy of Sciences (NAS) study, Tanker Spills: Prevention by Design, completed this past February, which evaluated 17 different oil tanker design concepts.

The Coast Guard has also initiated an R&D project that will use probabilistic oil outflow computer modeling to evaluate three designs in addition to the double-hull and mid-deck designs which were considered in the IMO comparative study. These three additional designs are the Coulombi Egg, the POLMIS tanker, and the American Underpressure method [see article on this method below]. Unlike the IMO comparative study, this project will evaluate not only total oil outflow, but also the probability of zero oil outflow.

The Coast Guard intends to use the NAS study, the IMO Comparative Study on Oil Tanker Design, and the results of their R&D project to assist in determining if there are equivalents to double hulls for the report to Congress which is scheduled for completion this summer.

Editor's Note: Special thanks to Commander **Popko** and Mr. **Shapiro** for providing this up-to-the-minute report. Both work for the Coast Guard's Standards Development Branch (G-MVI-2), Merchant Vessel Inspection & Documentation Division at U.S. Coast Guard Headquarters in Washington, D.C., which is in the midst of developing the U.S. regulations for double hulls.

New American Underpressure System —An Interim Solution

MH Systems, Inc., Del Mar, Calif., developer of the American Underpressure System called Spillstop, has performed probabilistic outflow analysis and cost analysis of the system. The system might prove to be a cost-effective interim solution for existing tankers to prevent or reduce the outflow of cargo.

According to **Mo Husain,** president of MH Systems, Inc., the system can be installed at low cost as a retrofit to existing tankers. The system utilizes continuous, dynamically controlled underpressure to prevent or reduce cargo loss in collision or grounding accidents. The level of protection is approximately the same as afforded by alternative systems using a double hull or an intermediate deck, according to Mr. **Husain.** The system utilizes sophisticated electronic control system for the functional operation of the system.

Approximate accident statistics reported by the National Academy of Sciences can be used to develop estimates of average or expected cargo loss for various systems. In a typical analysis, a notional tanker design of 280,000 dwt was used by MH Systems, Inc., as a baseline for evaluation.

For each possible location of damage, the cargo loss from the affected tank was determined for each alternative design. MH Systems, Inc., used these loss estimates in combination with accident statistics to give a probabilistic estimate of average loss reduction. The results were:

Mid-Deck Tanker, with Side Hull	90 percent
Double-Hull Tanker with American Underpressure Sys	82 percent
Double-Hull Tanker	66 percent
American Underpressure System	65 percent
Double-Bottom Tanker	44 percent

The tanker analyzed in the study could be fitted out with the American Underpressure System for about $2.5 million, reports MH Systems, Inc., compared to about $80 million for the double hull and an even higher cost for the intermediate deck option.

For free literature detailing the American Underpressure System Spillstop from MH Systems, Inc.,

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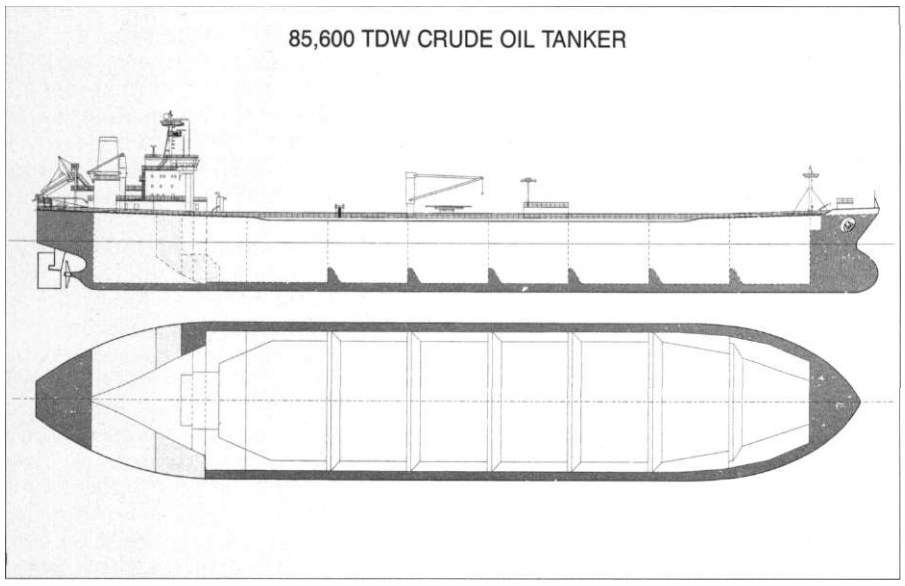

Outboard profile drawing of the 85,000-dwt double-skin tankers under construction at the Ancona shipyard of Fincantieri.

14 New Generation Double-Skin Tankers Being Built By Fincantieri

The double-hull configuration for tankers entering U.S. ports, as required by the Oil Pollution Act of 1990, will phase out of service a sizable number of large oil carriers built in the first half of the 1970s. This fact will stimulate the demand for safer, more technologically advanced vessels.

The Italian shipbuilder Fincantieri has been building double-skin tankers since the 1970s. Additionally, the builder has constructed several advanced skimming vessels as well.

Fincantieri's present order book boasts 14 double-skin tankers designed and built in accordance with the criteria set down in OPA 90, as well as forthcoming IMO regulations.

Notable among these new generation tankers are eight sister ships under construction at Fincantieri's Ancona shipyard. The 85,000-dwt double-hulled ships are 731 feet long, offering thorough protection in case of collision or grounding. They also feature segregated oil tanks, which are completely independent of the ballast water tanks. Propulsion power is provided by a single GMT-Sulzer model 7RTA62 main diesel engine, with an MCR of 11,620 at 73 rpm.

The eight oil carriers are on order for several owners—five for Almare di Navigazione (Finmare Group), and one each for Finaval (Barbaro Group), Fermar (Ferruzzi Group), and Premuda Societ di Navigazione. Other double-hull tanks on order at Fincantieri are: two 150,000-dwt ships for Snam (Eni Group) at the Marghera yard; two 32,000-dwt ships for Finaval and Fermar at the Sestri yard; and two 11,500-dwt ships for D'Alesio at the Livorno yard.

Furthermore, Fincantieri is a member of a European consortium developing a tanker for the 21st century. Through an agreement between Fincantieri, Astilleros Espanoles (Spain), Bremer Vulkan and Howaldtswerke-Deutsche Werft (Germany), and Chantier de l'Atlantique (France), a so-called "E 3 Tanker"—European, Ecological and Economical—is under development. The E3 Tanker consortium is designing a two-million-barrel-capacity, 280,000-dwt VLCC, provided with built-in structural safety features—a double hull, totally segregated ballast tanks, and active safety systems. In particular, besides possible quick transfer cargo systems between the various ship's tanks, and ballast tank gas detection and ventilation systems, anti-collision integrated navigation systems and automated maneuvering and emergency control systems will be integrated.

In the area of anti-pollution vessels, between 1989 and 1990, Fincantieri completed four Cassiopea Class craft for the Italian Ministry of the Merchant Marine, in compliance with the 1982 Italian Law on Sea Protection.

These 1,450-ton multipurpose vessels played a critical role in limiting the environmental damage after recent tanker accidents in the Tyrrhenian Sea.

In addition, Fincantieri has developed specialized coastal craft designed for anti-pollution services in restricted areas, and a multipurpose offshore vessel with a service speed of more than 22 knots, able to quickly intervene on an expanded range.

For free literature on the shipbuilding and repair services of Fincantieri,

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Double-Hulled 'Patriot' Delivered By Samsung For Conoco Shipping

New Generation Crude Carrier

One of the first U.S.-owned tankers built in the world to conform with the Oil Pollution Act of 1990, the 95,000-dwt Patriot was delivered earlier this year to Conoco Shipping, a subsidiary of Du Pont.

Built by South Korean shipbuilder Samsung Heavy Industries Co., Ltd., Shipbuilding & Offshore Division, the Patriot is the first of four new generation single-screw, Aframax crude oil tankers ordered by Conoco with double hulls. The space between the inner and outer hulls varies between 2 meters and 2.4 meters.

The Liberian-flagged Patriot, which has already carried her first cargo from Venezuela for Exxon, has an overall length of 797 feet, breadth of 137 feet and designed draft of 40 feet. Main propulsion is supplied by a single Sulzer 6RTA62 diesel engine, with a nominal continuous rating of 13,500 bhp, burning about 40.2 metric tons of fuel oil per day. The engine's maximum continuous rating is 15,000 bhp at 104 rpm. Its specific fuel oil consumption at mcr during testing was 126.0 g/bhp/hr. She can carry about 2,400 m^3 of heavy fuel oil, giving her a cruising range of 19,000 nautical miles. Service speed is about 16 knots.

With seven crude tanks aboard, with capacities from 19,000 to 80,000 bbls, the Patriot can carry as much as 692,000 bbl. She also has two slop tanks and four pairs of water ballast tanks.

Her cargo tank structure was built to have a double-skin arrangement to protect the bottom and wing tanks in order to minimize the environmental pollution in the event of an oil spill. The Patriot's No.'s 1, 5, 6 and slop tanks were strengthened against the adverse effects caused under partial load conditions. Additional design features in the cargo tanks include vertically corrugated oil-tight and water-tight transverse bulkheads with lower and upper stores

Classed by ABS, "+A1, (E), 'Oil Tanker,' +AMS, +ACCU, the Patriot has a bulbous bow, transom stern and a single continuous deck. Samsung carried out numerical analysis, hull and wave pattern analysis and testing at Kriso in Korea in order to develop an optimized hull for the new generation Patriot and her sisters.

For free literature on the shipbuilding services of Samsung,

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Houston-based Conoco's Patriot is one of the first double-hulled tankers built to conform to the requirements of the Oil Pollution Act of 1990.

HDW's Design For Double-Hull Tanker To Be European Standard

In the wake of an International Maritime Organization (IMO) ruling that tankers over 5,000 dwt must have full double bottoms and wing tanks, a double-hull design from Howaldtswerke-Deutsche Werft (HDW) has been chosen by European shipyards as their building standard.

Because a Marpol convention amendment also grants equivalency to mid-deck height tankers with double-sided hulls, the yards have also made an option available for an intermediate-deck type available from the French yard of Chantiers de l'Atlantique.

In January 1991, the five shipyards of HDW, Chantiers de l'Atlantique (CA), Bremer Vulkan, Astilleros Espanoles and Fincantieri met at HDW's Kiel yard to agree to develop an environmentally safe VLCC design.

Known as the "E3" or "Ecological, Economical, European" project, all five yards contributed to the enterprise, with HDW carrying out the naval architecture aspects and CA coordinated the structural design work. None of the yards involved in the E3 project will pay a license fee, but they will each retain individual control over sales and marketing activities

The HDW-designed 280,000-dwt VLCC calls for a 4 meter (13.12 feet) double bottom and two longitudinal bulkheads in the cargo section.

The more flexible CA design incorporates a 6 meter (19.7 feet) spacing between inner and outer shells, with the intermediate subdivision being described as a "low mid-deck." The advantage of this arrangement is that when operating in areas where the U.S. Oil Pollution Act is in effect, the 6 meter double bottom becomes a void space, while in other waters it becomes an oil carrying tank space.

The French company is also a contender for several forthcoming cruise ship newbuilding projects.

HDW was the project leader in the German government's "Ship of the Future" program, and is currently working on advanced design proposals for the cruise shipping and liquefied hydrogen transportation sectors.

For further information regarding the facilities available at HDW, or details on the shipyard's new double-hull tanker design,

MarAd Publishes Amendment To Defense Production Act Of 1950

An amendment to the Revised Voluntary Tanker Agreement, located in section 708 of the Defense Production Act of 1950, was published by the U.S. Maritime Administration (MarAd) in the Federal Register.

MarAd is the sponsor of the agreement whereby tanker owners and charterers agree to make tankers and tank space available to the government during periods of national emergency.

The amendment extended the expiration date of the Act and improves the administration of voluntary agreements. Clarification is also provided of the legal protection provided through the antitrust defense available to participants when developing or carrying out a voluntary agreement or plan of action with the government.

Signatories of the Agreement are being provided with copies of the amendment

For further information, contact **Robert Nevel,** Maritime Administration, Office of National Security Plans, 400 7th St., S.W., Room PL-1303, Washington, D.C. 20590.

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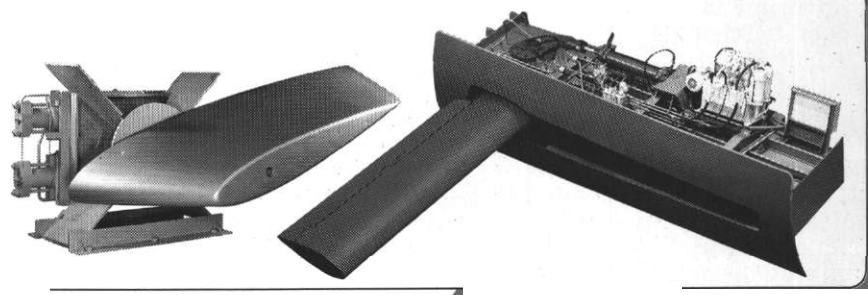

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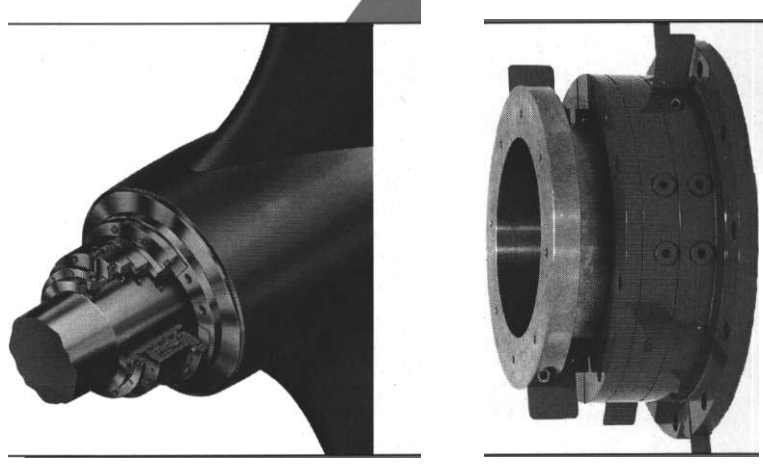

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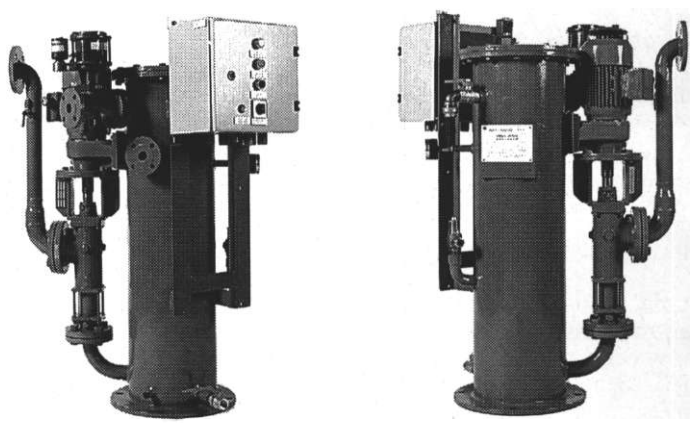

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Coast Guard Urges Unified Federal Spill Response Regulations

The U.S. Coast Guard is attempting to establish federal oil spill regulations that realize the concerns of the nation's coastal states, thereby avoiding a host of individual state spill laws.

While addressing the International Association of Independent Tanker Owners (Intertanko) in Genoa, **William Holt,** chief of the Coast Guard's Marine Environmental Protection Committee stated that his agency intends to "enact sound, strong federal rules so that states will not feel compelled to act on their own."

Acting on their rights under the 1990 Oil Pollution Act, most of the nation's 24 coastal states have already instituted strict oil spill legislation, including unlimited-liability, clean-up response and prevention statutes.

Draft rules for vessel response plans will be published only after discussions are first held with interested industry groups, such as tanker owners and operators. This is the first time that the Coast Guard has ever subjected prospective legislation to public scrutiny before making it official.

"We hope to use our decades of experience in the pollution prevention field to provide an example for the states, so that if they decide to enact rules, they will follow our lead and reflect the federal regulations," stated Mr. **Holt.**

After the Coast Guard's new set of rules are published on August 18th, companies will have six months to submit their oil spill prevention and response plans, or they will risk being banned from trading in the U.S.

The arrangements will probably include designating a company official with the full power to authorize oil clean-up operations, an active contract with a shoreside firm for the handling of large oil spills and submitting to the Coast Guard a workable oil spill response plan that details emergency equipment, personnel and their training.

At the Intertanko meeting, Mr. **Holt** was instructing tanker owners on how to prepare for the new regulations in order to stay in the U.S. oil trade.

Oil Pollution Act Spurs World Oil Industry To Drop Substandard Tankers

Regulations stemming from the United States Oil Pollution Act of 1990 is resulting in a major rethinking of tanker industry ship design, equipment, chartering, operations and liability procedures.

At the annual meeting in Genoa of the International Association of Independent Tanker Owners (Intertanko), industry leaders discussed new initiatives that could reshape the global tanker market long before the International Maritime Organization's (IMO) deadline for new tanker construction takes effect.

The industry generally agrees that the quality of the world tanker fleet must be improved by eliminating substandard shipping from the market, but how exactly this is to be done is a source of controversy.

One of the more important decisions to be made was that the results of five-year special ship surveys must be made available to the public. According to Capt. **William O. Gray,** president of Skaarup Oil Corp. of Greenwich, Conn., this previously confidential information will allow charterers to view important data concerning a vessel's structural condition. Exchanging survey information would help to reduce the number of ship inspections carried out.

Carrying the data exchange concept even further, **Lars Carlsson,** managing director of the Swedish tanker group Concordia Maritime, suggested that the names of tankers that have been rejected by a protection and indemnity club should be published. By identifying the classification society and marine underwriter responsible for certifying the vessel and providing insurance coverage, pressure would be raised for the improvement of ship survey and certification standards.

These and many other recommendations discussed during the Intertanko conference would strive towards the removal of unsuitable ships from the world's tanker fleet, more than half of which are over 16 years old. According to Chevron officials, one-third of all existing tankers can be considered substandard.

Double-Hull Tankers Being Built To ABS Class Worldwide (in thousands of dwt)

Builder	Qty	Dwt
China Shipbuilding	1	40.0
Fincantieri	8	78.0
Fincantieri	2	155.0
Hyundai	8	85.0
Hyundai	4	95.0
Hyundai	3	278.0
IHI (Aichi)	2	142.0
IHI (Kure)	1	148.0
Ishibras	3	132.0
Ishibras	1	148.1
MHI	1	140.3
Samsung	4	95.0
Samsung	3	148.5
Sanoyas	1	94.5
Sanoyasu	1	94.5
SEC	1	12.0
Sumitomo	2	301.8
Stocznia	2	90.2
TOTAL	**48**	**5.8 million**

Source: ABS

Worldwide Tanker Order Book Hits 15-Year High

Double Hulls Account For 28 Percent Of Tanker Orders

Despite the fact that oil tanker contracting slowed down considerably last year from the 1990, the tanker order book worldwide is at its highest levels in 15 years, according to the Independent Tanker Owners Association (INTERTANKO).

At its highest level since 1976, the current tanker order book stands at 363 ships set for delivery between now and 1995. New construction pirces have begun to decline as demand for new ships drops. The cost of a new single-hull, 250,000-dwt tanker built in Japan peaked at $95 million in August-September 1991, according to Intertanko. At the end of February 1992, the price reportedly dropped to $87 million. This drop in price was not attributable to currency fluctuation, Intertanko notes.

In 1991, tankers of 12.9 million dwt were contracted to 27.5 million dwt in 1990. Tanker contracting slowed down in 1991, and during the last quarter of 1991, as 3.6 million dwt was ordered.

Almost all of the 1991 orders for Very Large Crude Carriers (VLCCs) were placed with Japanese and South Korean shipyards. A large percentage of the VLCC orders were placed as replacement of old tonnage and committed to long-term charters. While Suezmax size tanker ordering dropped considerably in 1991, Aframax size vessel ordering remained very close to the contracting levels of 1990.

According to Clarkson Research Ltd., the oil tanker order book was 40.7 million dwt as of January 1, 1992, up 7 percent from January 1, 1991. This year, 196 tankers totaling 19.2 million dwt will be delivered—up 70 percent of 1991. In 1993, 125 tankers totaling 15.2 million dwt will be delivered; and in 1994, 39 tankers amounting to 6.1 million dwt are scheduled for delivery.

About 76 percent of the orders have been placed with Far East yards, 13 percent in Western Europe, 6 percent in Eastern Europe and 5 percent in other regions.

Oil tankers specified with double sides, double bottoms or double skins, account for 28 percent of the order book. This year, 52 of these type tankers, totaling 5.3 million dwt, will be delivered. Next year, 32 others (4.1 million dwt) are scheduled for delivery; and an additional 10 (1.9 million dwt) in 1994. One double-hull VLCC will be delivered this year, followed by six in 1993 and five in 1994.

Tankers For Delivery, 1992-1995
(in millions of deadweight tons)

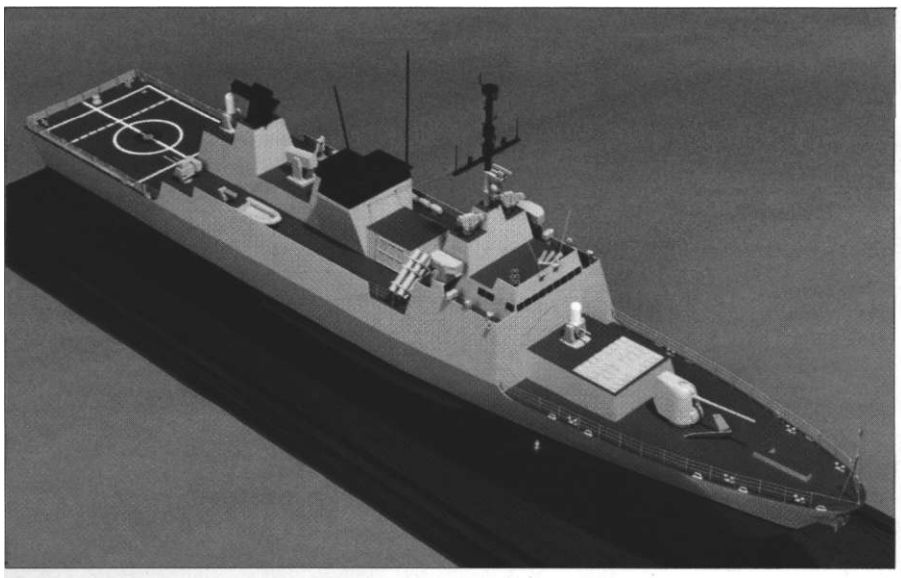
Tanker Size	1992	1993	1994	1995 & Up	Total
10,000-50,000 dwt	2.7	1.4	0.4	0.01	4.5
50,000-100,000 dwt	4.3	3.0	0.9	0.2	8.4
100,000-200,000 dwt	4.8	1.7	–	–	6.5
over 200,000 dwt	7.4	9.1	4.8	–	21.3
Total dwt—	19.2	15.2	6.1	0.2	40.7

Source: Clarkson Research/Intertanko

Age Profile of the U.S. Tanker Fleet (No. of Ships in Each Age Category)

Dwt (in 000s)	Total Ships	0-5 Yrs.	6-10 Yrs.	11-15 Yrs.	16-20 Yrs.	21-25 Yrs.	26-30 Yrs.	31-35 Yrs.	3640 Yrs.	over 40 Yrs.
200 & up	14	2	0	9	3	0	0	0	0	0
100-199	21	0	0	13	8	0	0	0	0	0
60-99	46	0	4	18	13	8	1	1	1	0
20-59	137	8	28	11	18	14	9	34	6	9
10-19	13	0	0	2	1	3	3	0	2	2
under 10	82	0	9	14	7	3	3	7	6	33
Total	313	10	41	67	50	28	16	42	15	44

Source: IMA Associates, Inc., "Five-Year Outlook for the U.S. Marine Industry, 1992"



Model of the new FF-21 multimission frigate design Newport News Shipbuilding plans to market to foreign navies.

Newport News Markets Frigate Design To World

Newport News Shipbuilding & Drydock Corp., Newport News, Va., recently unveiled a new frigate design which it plans to offer to the worldwide military market. Costing about $400 million, the new FF-21 frigate would be in direct competition with reportedly more expensive designs from Germany and France.

The FF-21 concept is a state-of-the-art high-speed frigate incorporating proven and supportable systems for protection from subsurface, surface and airborne threats. Additionally, this highly automated vessel will be capable of operating independently or as an integral component in multiservice defensive operations.

The FF-21 multimission frigate design is a product of the combined talents and resources of Newport News Shipbuilding, Hughes and John J. McMullen Associates—leaders in ship design, construction and combat systems development and integration. As a result, the FF-21 incorporates the latest technologies in hull, mechanical, and electrical systems, as well as in weapons delivery components, combat system sensors, data management, and communications systems.

Newport News claims that the FF-21 would be "faster, stealthier and less expensive" than Germany's MEKO frigate or France's Lafayette Class version. The two foreign designs are estimated to cost about $450 million apiece.

There are about 10 to 12 countries around the world currently buying such ships. The most likely markets for the new frigate would be in the Middle East, Far East and Latin America.

The FF-21 will have an overall length of 322 feet, maximum beam of 50 feet, draft of 12 feet, and full load displacement of 2,494 metric tons.

Propulsion will be provided by a CODOG (Combined Diesel or Gas Turbine) system consisting of twin LM2500 gas turbines producing 60,000 hp and two 12-cylinder MTU diesels producing 8,840 hp. The maximum speed of the FF-21 will be over 33 knots using the gas turbines. The two diesels will provide a maximum speed of 22 knots for cruise propulsion. Four MTU diesel generators will supply auxiliary power.

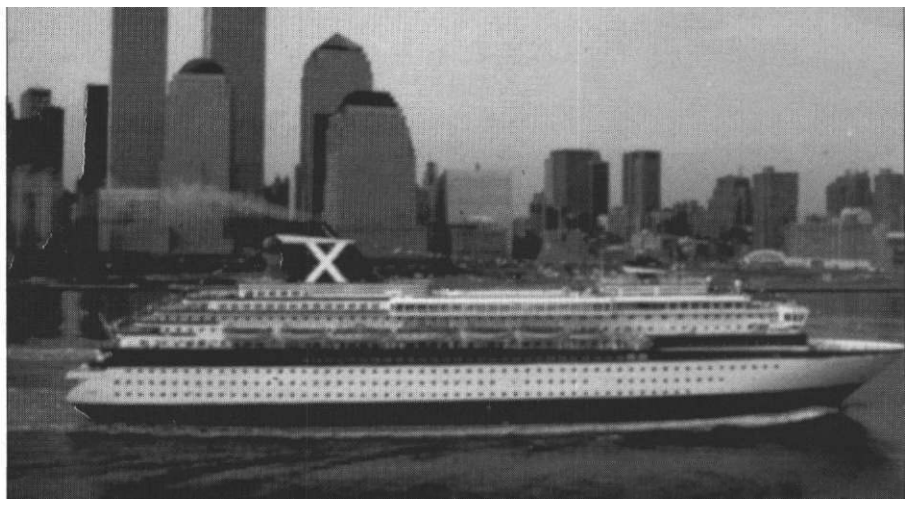
The FF-21 incorporates proven weapons systems, such as General Dynamics' Close-In Weapon Systems (CIWS), as well as a highly integrated antisubmarine capability.

Keel Layed For Cruise Ship Maasdam At Fincantieri Shipyard

During her keel laying ceremony, the first 600-ton module section of the MS Maasdam's double bottom was placed in the shipbuilding dock at Fincantieri shipyard in Monfalcone, Italy. The 35-foot-long ship's keel section extends the full width of the vessel and stands 25 feet high.

The Maasdam is the second of Holland America Line's three ship new construction program. Her delivery is scheduled for late 1993, with the Statendam scheduled for a late 1992 delivery and the Ryndam in 1994. She will be the fifth ship to bear the name Maasdam in Holland America's 119-year history.

Work on the vessel is on schedule with further modules being fitted to the Maasdam in May. When completed, the 50,000-grt cruise ship will be 720 feet long and have a beam of 101 feet. She will carry 1,266 passengers and have a mixed crew of 550 Dutch officers and Indonesian and Filipino crewmen.



The MAN B&W-Powered cruise ship Zenith.

Cruise Ship Zenith Delivered To Chandris Celebrity Cruises By Meyer Werft

The cruise vessel Zenith was recently delivered to Celebrity Chandris Cruises by Meyer Werft of Papenburg, Germany.

The ship is 682 feet long, with a beam of 95 feet and a draft of 24 feet. Powered by a "father and son" four engine plant, a cruising speed of 21.4 knots can be attained. The plant consists of two MAN B&W 9 L "father" engines and two MAN B&W 6 L "son" engines. The larger engines have an output of 5,994 kw, and the smaller engines develop 3,996 kw. Power from the plant is transmitted to the two controllable pitch propeller plants via double reduction gears with integrated lamella couplings.

For additional maneuverability, the Zenith was fitted with two bow thrusters, one stern thruster, and two flap rudders which are operated by a joystick.

The vessel is equipped with five diesel generating sets as well as one emergency generator to provide all necessary electrical power.

The 47,255-gt Zenith can carry 1,374 passengers and crew. The vessel will operate seven-night cruises from Fort Lauderdale, Fla., to the Caribbean.

The Zenith's sister ship, Horizon, has been cruising the Caribbean and to Bermuda since May 1990.

The launching of the Zenith was reported in Maritime Reporter's April, 1992 issue.

For further information about the services and facilities provided by Meyer Werft,

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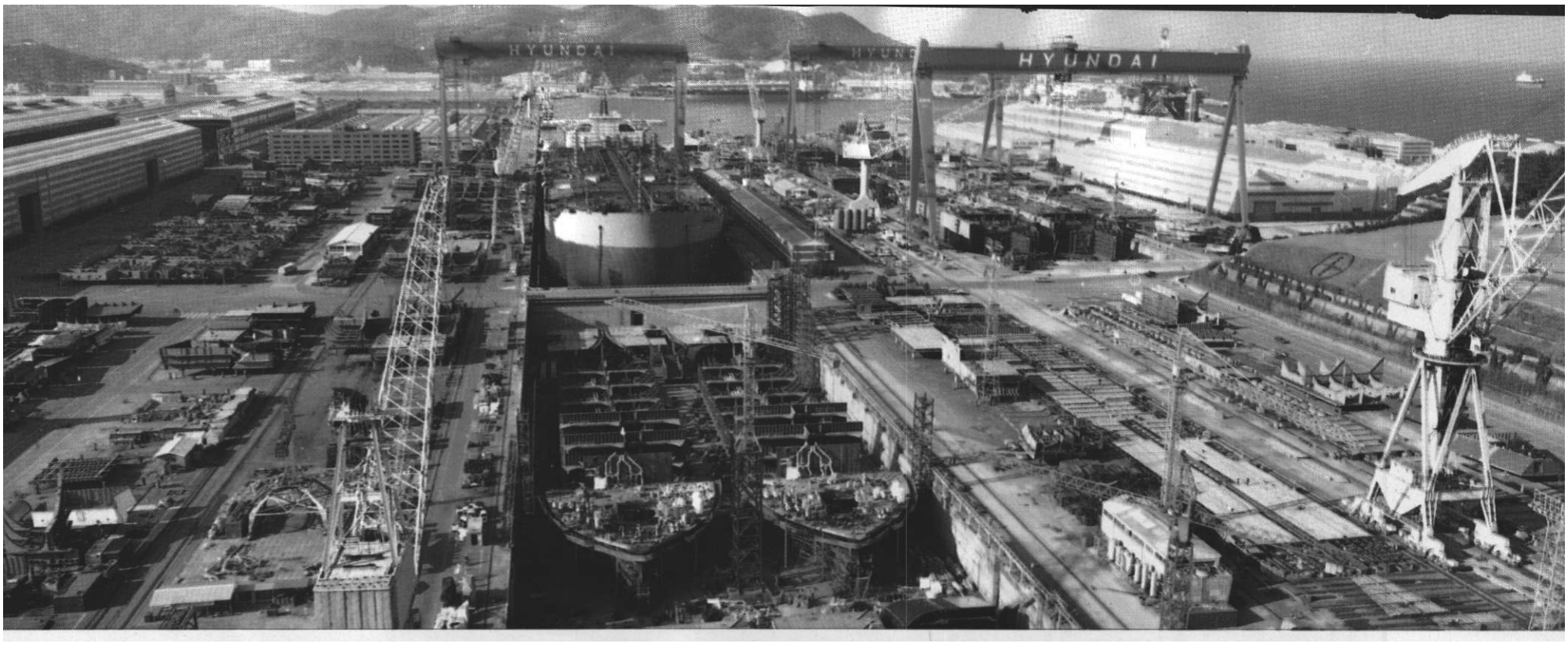
Diamond M-Odeco Teams With VODL To Enter Floating Production Market

Houston-based Diamond M-Odeco, one of the world's largest offshore drilling companies, plans to enter the global floating production market by forming an association with Victoria Oilfield Development Ltd., (VODL), of London. VODL was established by Seatramp Inc., of London, last year, operator of one of the world's largest international tanker shipping groups.

After the acquisition of Odeco, Diamond M-Odeco now operates a worldwide fleet of 40 semi-submersible and jack-up rigs. Working with VODL, which has access to a 20-strong fleet of vessels totalling over 3.6 million dwt, the two companies intend to offer a global floating production service providing a wide choice of tanker and semi-submersible or jack-up systems. This is the first time that a rig owner, Diamond M-Odeco, and a tanker owner, VODL, have joined forces to explore growth opportunities together.

The parent company of Diamond M-Odeco is Loews Corporation of New York. Loews possesses a 49 percent holding in Hellspont Shipping Corporation, owners of six Ultra Large Crude Carriers in the Seatramp-operated fleet.

As part of their agreement, VODL will establish offices at Diamond M-Odeco's Houston headquarters, while Diamond M-Odeco personnel will spend time at VODL's London offices. The exchange of personnel and expertise will allow both companies to plan strategy for the joint pursuit of business opportunities in this expanding sector of the offshore oil industry.



Aerial view of the Hyundai Ulsan Shipyard.

Special Report

BOOM TIMES FOR KOREAN SHIPBUILDING

The world's second largest shipbuilding nation, Korea, is in the midst of a shipbuilding boom. All the leading indicators—order receipts, actual ship construction, backlogs and ship prices—are all on the rise.

According to the Korea Shipbuilders' Association (KSA), total shipbuilding orders from domestic and overseas shipowners last year reached 5.43 million gross tons, totaling 121 vessels (111 vessels for export). This represented a rise of 24 percent from the previous year, breaking the industry's target of 4.3 million gt. Industry observers say that this was an unprecedented performance, considering the sluggish first half of the year caused by the Gulf War. Total orders for 1992 are expected to reach a similar level.

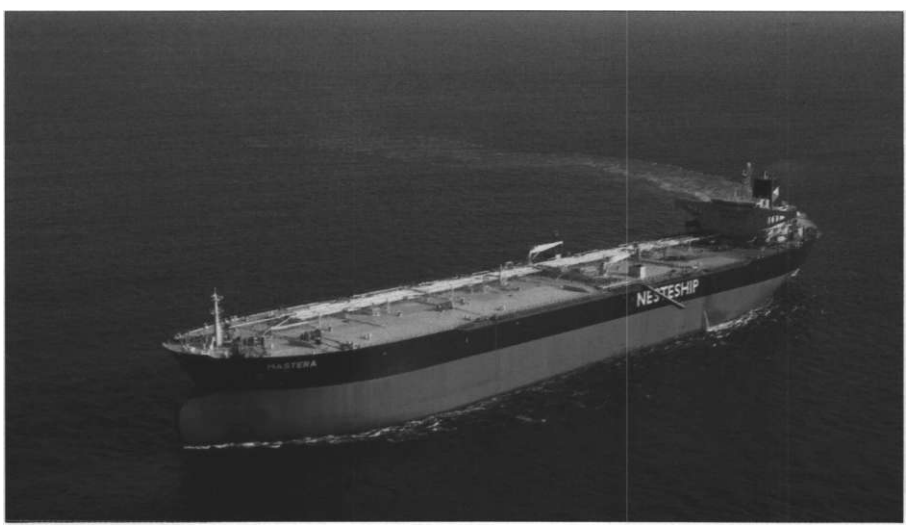
Almost all industry analysts in Seoul forecast that the boom will continue through the 1990s. A normal cycle in the shipbuilding industry is a 10-year boom followed by a 10-year recession. A great number of ships, mostly very large crude carriers (VLCCs), were built in the mid-1970s and are nearing retirement age. Statistics provided by Lloyd's Register also show that the number of ships built before 1980 account for around 60 percent of the world's ships. In the case of tankers, the figure stands at a whopping 74 percent. Korea's shipbuilding orders from overseas during the last few years have largely been for tankers.

Another factor expected to contribute to the growth in shipyard revenues is the double-hull requirement for tank barges and tankers.

During the 1995-2010 period, existing ships will have to be replaced with double-hull types. Prices of double-hull ships are 15 to 20 percent higher than for single-hull vessels, according to one industry analyst. Some shipping companies which had originally opted to extend the service life of existing ships through retrofit or reconstruction are expected to buy new ships instead due to their greater efficiency and other competitive advantages.

According to KSA, three major local shipbuilders—Hyundai Heavy Industries Co., Daewoo Shipbuilding & Heavy Machinery, Ltd., and Samsung Heavy Industries Co.—received orders for 23 double-hull vessels during the first 10 months of last year.

This year, local shipyards may not only witness rising orders but also enhanced profitability. Current ship prices are higher than in 1981, when prices were at an all-time high. In the case of a 250,000-ton oil tanker, for instance, the price is about $100 million, compared to $47 million in 1985. While the price of a 70,000-ton bulk carrier rose to more than $32 million from $14 million, the price for a 2,500-TEU full container ship soared to over $54 million from $26 million. Industry observers say that prices will continue to rise this year.



The Daewoo-built double-hull crude oil tanker delivered to Neste Oy earlier this year.

The industry's efforts to build higher value-added ships could help improve its financial status this year. While oil tankers, bulk carriers, container ships and other low value-added ships accounted for over 90 percent of the total orders received by Korean shipbuilders in 1991, such high-priced ships as LNG and LPG carriers started to appear on order lists last year.

In terms of actual shipbuilding, 1992 should be another good year for the industry. Last year, Korean shipyards' actual shipbuilding increased a hefty 24 percent from the year before, reaching 4.43 million gt (109 vessels), breaking the 4 million gt barrier for the first time in the nation's shipbuilding history. This significant performance was mostly attributed to sharply reduced labor disputes. Industry analysts project that this buoyant mood in actual shipbuilding will continue this year, with the anticipation of more than 4 million gt.

More significantly, backlogged orders as of the end of last year stood at 7.74 million gt (152 vessels), an impressive 15.4 percent rise from 1990, reflecting brisk order receipts since the last of 1989. Analysts say

that the backlog of orders are enough to keep Korean shipbuilders busy until 1993, considering that the combined capacity of Korean shipyards is about 3.5 million gt a year, according to the KSA statistics. By company, Hyundai secured orders of about 3 million gt, Daewoo, 2.7 million gt, and Samsung, 1.3 million gt.

For Korean shipyards, signs of recovery started in 1989. The nation's strategic industry suffered from a long and tedious slump since the early 1980s when the world shipping and shipbuilding markets plunged into a prolonged recession.

By the start of 1989, both shipbuilding orders and ship prices were rising sharply, as major shipbuilding countries reduced their production capacity in response to the prolonged recession. A KSA official says that Japanese shipbuilders dissolved an anti-recessionary cartel on September 30, 1989, following signs of a recovery in orders, but they are not likely to expand capacity. He also says that Japanese firms already had enough orders at that time to operate at full capacity until the first half of 1992, leading buyers to direct orders towards Korea.

In another boost for domestic shipyards, Korea signed contracts with the Soviet Union (now the Commonwealth of Independent States) to build 12 ships worth $150 million and to repair 30 vessels for $20 million in 1989—the first significant contracts between the two countries. Since then, orders from the CIS have been steadily increasing.

Despite such signs of a recovery in order receipts, however, 1989 was another poor year for actual shipbuilding, which recorded a 13.8 percent drop from the previous year. Frequent and violent labor disputes, which had emerged as one of the nation's major economic and social problems in 1987, seriously affected major local shipyards in 1989.

Since 1990, however, the labor unrest has sharply declined in the nation's manufacturing workplaces as a whole, including all local shipyards, resulting in a significant 22.1 percent rise in the nation's actual shipbuilding in 1990 from a year earlier.

However, some executives at major Korean shipbuilders expressed concern that there are signs of the industry entering an adjustment stage in the short run. Because most of the ships ordered during the boom of 1989-91 are expected to be delivered this year, the industry is apprehensive about an oversupply of ships, leading to a decrease in ship prices.

"This does not mean that the industry is goinginto a recession again, but it may result in a short-term slump in order receipts," said one executive from Hyundai. Korean shipbuilders, in fact, received no new orders this past February.

Other concerns for the industry include—mounting pressure from the U.S. and EC to reduce the Korean Government's subsidies and the introduction of anti-dumping rules, as well as a worsening flow of funds in the global financial market, which could result in the freezing of shipbuilding funds, points out one executive.

Major Builders

Last year was a remarkable year for the Korean shipbuilding giants, who showed a 40 percent rise on average from the previous year based on the number of orders received and ships built. More significantly, the nation's five major shipbuilders finally returned to a surplus in their net profits for the first time in a decade.

Just a year ago, few could forecast this dramatic turnaround in the shipbuilding industry. The unexpected and prolonged Persian Gulf crisis had put the brakes on the long-awaited recovery of Korea's shipbuilding industry. However, the rush of orders since September 1991, along with sharply reduced labor disputes at shipyards, appeared enough to offset the crisis.

What raised the eyebrows of many people was that last year Daewoo Shipbuilding & Heavy Machinery, which suffered from snowballing deficits and violent labor strikes, recorded its first surplus, 79 billion won (about $99.7 million), in its net profits since 1984.

Although exact figures are not available yet, Halla Engineering and Heavy Industries also is expected to report a surplus for the year, its first since its was founded under the name of Inchon Engineering and Shipbuilding Corp. in 1977. Hyundai is expected to report increased earnings, while Samsung, which had been in the red with its shipbuilding division since 1983, also returned to the black.

Hyundai Heavy Industries

Hyundai Heavy Industries Co. (HHI), a subsidiary of the Hyundai Group, is reportedly the largest single shipyard in the world, covering over 7.2 million square meters. Since its opening in 1973, HHI has expanded its activities to include industrial plants, offshore engineering, and engine and machinery building as well as shipbuilding. HHI's facilities include seven drydocks, one slipway and one ship lift. The drydock sizes vary from 15,000 dwt to 1 million dwt capacity.

Over the past 18 years, HHI has built 505 vessels aggregating 30,7 million dwt. Ships types built range from conventional bulk and crude carriers to highly sophisticated OBO carriers, chemical tankers, RO/RO ships, container and passenger vessels and semisubmersibles.

Last year, HHI had a 30 percent rise in sales, totaling about $2.52 billion. More significantly, its net profit reached about $259 million in 1991, six times its net profitin 1990. Sales for the shipbuilding division accounted for about 65 percent of the total.

HHI's current strategy is to intensify its R&D activities in order to consolidate its involvement in building sophisticated and high-tech ships, such as LPG and LNG carriers and cruise ships. In order to do this, HHI plans to spend about $200 million on streamlining its production facilities and another $72.6 million into improving R&D activities.

Daewoo Shipbuilding

The Okpo shipyard of Daewoo Shipbuilding and Heavy Machinery Ltd., an affiliate of the Daewoo Group, has delivered 144 vessels totaling 11 million dwt since it opened in 1978. Deliveries by the yard include 46 crude oil tankers, 52 bulk carriers, 25 containerships and 21 other types of vessels.

Divided into three sectors—shipbuilding, industrial and offshore—Daewoo's three divisions combined for sales of $1.39 billion, a whopping increase of 55.7 percent over 1990 figures, and a net profit of $99.7 million. According to a Daewoo official, the company expects to have total sales of $1.51 billion and profits of about $151.4 million in 1992.

In the past, Daewoo has concentrated on the VLCC market. Now, however, in the face of an unstable tanker market, Daewoo has begun to diversify into building special barge ships, LNG carriers and military vessels. The company is investing a total of $84.2 million to upgrade its facilities and R&D activities.

Samsung Heavy Industries Co.

The heavy industrial arm of Korea's largest conglomerate, Samsung Heavy Industries Co., which consists of four divisions, has its main shipyard complex on Koje Island, off the south coast of the Korean Peninsula. The company produces heavy machinery at Changwon Industrial Complex.

The 1.7 million square meter Koj e shipyard has two dry docks, both of which are capable of constructing 150,000-dwt and 250,000-dwt vessels. The company's hull shop has an annual capacity of 120,000 tons of steel plates.

Since 1977 when it entered the shipbuilding business, Samsung has delivered 83 vessels totaling 6.32 million dwt, including 22 full containerships, 16 bulk carriers, 10 crude oil tankers, 15 products carriers and seven chemical carriers. Samsung also has recently received orders for eight double-hull tankers from the U.S., Norway, and Canada. It recently delivered the double-hulled M/T Patriot to Conoco Inc.

The shipbuilding division of Samsung recorded a profit of $40.4 million in 1991, its first since 1982. Samsung's turnover showed a raise

of 27.2 percent from 1990 to $1.97 billion. Samsung expects its turnover for 1992 to top $2.4 billion, up 22 percent over last year.

Hanjin Heavy Industries

Officials from Hanjin Heavy Industries Co., the former Korea Shipbuilding and Engineering Corp., expect to record a $18.9 million surplus in 1992, up from a $8.9 million deficit last year. Company officials attribute the optimistic forecast to rising order receipts, which can already keep the shipyard busy until 1993. Hanjin recently received orders for two 44,000-ton oil tankers and is negotiating for additional two 40,000-ton product carriers.

Hanjin has two shipyards at Yongdo and Ulsan. While Yongdo shipyard has three docks capable of building 360,000 dwt ships and one berth capable of handling 25,000 dwt ships, Ulsan shipyard has three berths capable of handling 120,000 dwt and one floating dock.

Halla Engineering

Halla Engineering and Heavy Industries Co., formerly Inchon Engineering and Shipbuilding, has an annual shipbuilding capacity of 180,000 dwt along with a ship repair capacity of 1 million dwt. Over the past decade, Halla has built a variety of ships, including a 40,000-dwt product tanker, 1,900-TEU container vessel, 14,300-dwt chemical tanker and a 37,000-dwt bulk carrier.

For free literature detailing the shipbuilding facilities and capabilities of any of the Korean shipyards detailed in this report, see the accompanying table.

Reader Service Numbers For Korean Shipyards

Shipyard	Number
Hyundai Heavy Industries	135
Samsung Heavy Industries	136
Halla Engineering	136
Daewoo Shipbuilding	138
Hanjin Heavy Industries	139

Table 1
1991 Korean Shipbuilding Orders
(in thousands of GT)

	EXPORT		TOTAL	
Yard	No. of ships	Volume	No. of ships	Volume
Hyundai	51	2,977	53	3,073
Daewoo	12	1,329	12	1,329
Hanjin-Yongdo	2	94	2	94
Hanjin-Ulsan	3	32	3	32
Samsung	10	654	10	654
Dae Dong	9	34	12	41
Dae Sun	6	13	11	27
Shin-A	7	18	7	18
Halla	7	161	7	161
Others	4	6	4	6
TOTAL-	111	5,317	121	5,434

Table 2
Actual Shipbuilding At Korean Yards
During 1991
(in thousands of GT)

	EXPORT		TOTAL	
Yard	no. of ships	Volume	No. of ships	Volume
Hyundai	34	2,185	34	2,185
Daewoo	13	1,554	15	1,626
Hanjin-Yongdo	–	–	3	108
Hanjin-Ulsan	4	10	4	10
Samsung	7	340	7	340
Dae Dong	3	8	6	12
Dae Sun	2	1	10	13
Shin-A	3	7	7	13
Halla	4	109	4	109
Others	17	3	19	3
TOTAL-	87	4,221	109	4,430

Table 3
1991 Backlog At Korean Yards
(in thousands of GT)

	EXPORT		TOTAL	
Yard	No. of ships	Volume	No. of ships	Volume
Hyundai	62	3,824	64	3,920
Daewoo	16	1,967	16	1,927
Hanjin-Yongdo	6	305	7	352
Hanjin-Ulsan	4	37	4	37
Samsung	17	1,117	17	1,117
Dae Dong	9	34	11	38
Dae Sun	6	13	9	22
Shin-A	4	10	4	10
Halla	11	269	11	269
Others	9	7	9	7
TOTAL-	144	7,581	152	7,738

Source: Korean Shipbuilders' Association

Table 4
Korean Shipbuilding By Ship Type
(in thousands GT)

	EXPORT		TOTAL	
Ship Type	No of ships	Volume	No. of ships	Volume
Tanker	24	2,682	24	2,682
Product Carrier	4	109	4	109
Chemical Tanker	1	1	3	6
Combined Carrier	12	758	12	758
Bulk Carrier	8	138	9	143
General Cargo Carrier	1	4	2	7
Full Container	13	410	22	604
Gas Carrier	5	113	5	113
Others	19	5	28	8
TOTAL—	87	4,221	109	4,430

Note: Tonnage totals may differ due to rounding off.

Great Lakes/Rivers SNAME Announces Spring/Fall Meetings

The Great Lakes and Great Rivers section of the Society of Naval Architects and Marine Engineers (SNAME) has announced the dates for its spring and fall meetings.

The spring meeting is to be held June 3-4, 1992, at the Holiday Inn O'Hare-Kennedy in Chicago, 111. There will be a presentation of papers dealing with safety considerations in ship design, including "The International Load Line Convention: Crossroads to the Future" by Dr. **Randy J.Paulling** and Dr. **Nils Salveston;** "Automatic Finite Element Modelling of Stress Concentrations and Localized Damage Regions" by Professor **Movses Keldjian,** University of Michigan; and "Bulk Carriers: A Cause for Concern" by **Philip** G. **Ryan,** ABS Americas.

A banquet dinner will also be held following the early bird reception with Society president **Ron Kiss** as guest speaker.

The fall meeting will be held September 23-24, 1992, in Erie Pa.

Interworld Maritime Designs Crewboat Powered By Natural Gas

Interworld Maritime Corporation recently introduced a 3-foot model of a natural gas powered crewboat it designed for Exxon at the Cooperative Clean Air Technology Conference Show in Santa Barbara, Calif.

The company was chosen to design, develop and construct a 130-foot crewboat for Exxon. The development of the boat is in association with Santa Barbara Air Pollution Control, Southern California Gas Co., Southwest Research Institute, Caterpillar Inc. and the University of Alabama. Construction of the boat is expected to begin sometime this month.

MTITs 595 Diesel Series Design Concept Proven Aboard Ferry 'Deutschland'

MTU Friedrichshafen installed its first 12V 595 series diesel engine aboard the 476-foot ferry Deutschland in October of 1990. This model is rated at 2,100 kw at 1,500 rpm and replaced one of the ship's nine 1,840-kw, 12-cylinder MTU 956s.

The engine has had over 4,000 operating hours with a reported power level of 83 percent and a 95 percent share of the ship's service time. An MCS computer monitoring system, developed by MTU-Elektronik, was installed in order to gather data about the engine when installed aboard a ship. The conclusions gathered from the data taken from show that the engine is easy to maintain and should have low life-cycle costs. A split-circuit cooling system (TE concept), originally introduced with the 396 series, was also installed on the 595 series engine.

MTU has also been recording test results from a trial engine which was mounted on a factory test stand. The engine has reported logged 3,000 hours without any notable malfunctions. Based on a power output of 3,240 kw at 1,800 rpm, MTU says the average utilization rate is about 90 percent.

The 16V 595 engine was recently installed aboard the 331-foot car ferry, Aquastrada, being built by Rodriguez Cantieri Navali. MTU has also logged several other orders for the 595 series engine.

Operating Hours, 12 V 595 Trial Engine in *»Deutschland«* Ferry

M Engine operating hours • Ferry service hours

300

u	Jul 1990	Aug 1990	Sep 1990	Oct 1990	Nov 1990	Dec 1990	Jan 1991	Feb 1991	Mar 1991	Apr 1991	May 1991	Jun 1991	Jul 1991	Aug 1991	Sep 1991	Oct 1991
Operating hours / Month				2	214	390	234	235	311	388	356	364	306	378	302	400
Total	• — 7 0			72	286	676	910	1145	1456	1844	2200	2584	2890	3268	3570	3970
Engine share (%) of ferry service time					51,69	95,12	76,97	58,89	75,12	94,63	85,57	84,65	69,50	85,90	70,23	90,90

For free literature detailing the new 595 series diesel engine manufactured by MTU Friedrichshafen,

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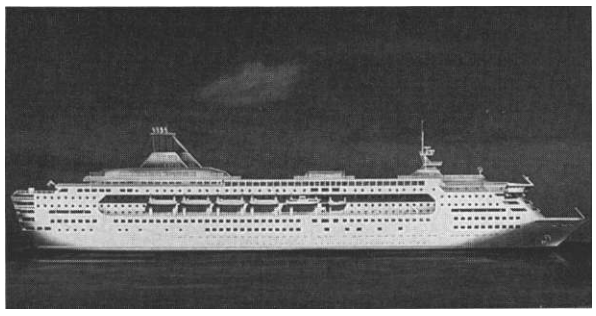

REGENT SKY RECEIVES WARTSILA DIESELS-

The refit work the Regent Sky is receiving at Alvis Shipyard, Greece, is comparable to a newbuilding. The vessel is owned by Greek shipowner Captain A. **Lelakis** and will be fitted in early 1992 with two 8-cylinder and two 6-cylinder Warsila Vasa 46 main engines and four 8-cylinder Warsila Vasa 32 auxiliary engines. Total machinery output will be 37,180 kw with all the ship's engines to be elastically mounted. The engines will be delivered from the Wartsila diesel factories in Turku and Vaasa, Finland. The Regent Sky is scheduled for completion in 1994 and will then begin worldwide operation, though she will primarily be sailing in the Caribbean.

AWO Elects Donald Duffy Chairman Of The Board

Donald F. Duffy was recently elected chairman of the board for American Waterways Operators (AWO) at its annual meeting. Mr. **Duffy** is presently vice president of sales, ocean towing, for Foss Maritime Company which is based in Seattle and specializes in harbor services, ocean towing, vessel repair and marine environmental support activities.

Omnithruster Delivers Third In Series Of Hydrojets To Japan

Omnithruster Inc., of Santa Fe Springs, Calif., has delivered the third in a series of hydrojet thruster for use on the Japanese Defense Agency Navy Mine Sweeper Ocean Vessels (MSO).

The Omnithruster Model JT-7001 AM thruster system is similar to those provided for the U.S. Navy over the last ten years. The systems were designed and qualified to a number of stringent military specifications including high shock and vibration survival, low noise and low electromagnet signatures. Peterson Builders and Marinette Marine supplied the vessels.

Omnithruster sales in Japan are performed by Kamone Propeller Co. Ltd. of Yokohama.

For further information detailing the Omnithruster hydrojets,

Circle 115 on Reader Service Card

Energy Transportation Names Kimball C. Chen Vice Chairman

Energy Transportation Corp. has announced the appointment of **Kimball C. Chen** as vice chairman of the subsidiary of Energy Transportation Group Inc.

Mr. **Chen,** who retains his previous title as vice chairman of Energy Transportation Group, will primarily be responsible for strategic planning, new business development, and capital market relationships.

Energy Transportation Group Inc. and subsidiary Energy Transportation Corp. are involved in the carriage of liquid natural gas and other areas of bulk shipping.

Trinity Marine Awarded $31.2 Million Contract By U.S. Army To Build Two LSVs For Philippines Navy

Trinity Industries, Inc., subsidiary Halter Marine, Inc., was recently awarded a $31.2 million contract by the U.S. Army to build two, 273-foot logistics support vessels (LSV) for use by the Philippines Navy. The contract also includes an option for a third vessel which could bring the value of the contract to about $47 million.

The announcement was made by **John Dane III,** president of the Trinity Marine Group. He said: "These new LSVs will be similar to, but not identical to five other LSVs recently built by Trinity shipyards for the U.S. Army. The Army version has bow and stern ramps for loading and unloading, while the Philippines ships will have only a bow ramp. The stern ramp space will be used to build temporary quarters for up to 150 people."

These sealift/landing ships are designed to carry RO/RO cargoes as well as other cargoes directly to the beach and to landing areas that do not have docking facilities.

According to Mr. **Dane,** no external cranes or port facilities are required for the LSV to perform its mission, and only four feet of water is required for landing with a full load.

Construction of the vessels has commenced at Moss Point Marine, Inc., a sister shipyard to Halter in Moss Point, Miss. Delivery is scheduled for June and September, 1993.

The two vessels will be 273 feet long, with a 60-foot beam, and a 16-foot 5-inch depth. The LSVs will be powered by two General Motors EMD-16-645E2 diesel engines which will give a speed of about 12 knots.

Each vessel is designed to carry up to 900 short tons during Logistics Over The Shore (LOTS) operations, and up to 2,000 short tons during intratheater line haul. Carrying a crew of 30, each of the ships will have a range of6,000 nautical miles.

The commercial design is modified to meet military requirements. Mr. **Dane** said: "This non-developmental item (NDI) design approach makes the LSV cost effective by incorporating equipment proven by years of use and testing. The adaptability of the design also makes the LSV ideal for inter-island and commercial ferry service."

The U.S. Navy and its Supervisor of Shipbuilding, Conversion, and Repair (SUPSHIPS) will be administering the Army contract. The ships will be built to American Bureau of Shipping (ABS) standards and will be classified ABS Maltese Cross A1 Circle E, Maltese Cross AMS, Maltese Cross ACC, and will meet Panama Canal and Suez Canal navigation regulations.

The Trinity Marine Group, Gulfport, Miss., is owned by Trinity Industries, Inc., Dallas, Texas.

For more information about the services and facilities provided by the Trinity Marine Group,

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Stena Offshore Considering Expanding By Converting One Of Its Vessels

Stena Offshore, a Swedish owned subsea contractor, has announced that it may convert one of its diving support vessels in order to expand its pipelaying capabilities.

The recent success with its pipelaying reelship, Stena Apache, has prompted the company to consider prospects for a second vessel. The Stena Apache recently broke the world depth record for laying rigid pipe.

At the present time three vessels are being considered for conversion and if the decision is made. The final decision depends on how current oil prices will affect the offshore industry and the cost of converting the vessel chosen.

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At the present time three vessels are being considered for conversion and if the decision is made. The final decision depends on how current oil prices will affect the offshore industry and the cost of converting the vessel chosen.

POSIDONIA 92

Biennial International Exhibition Set For June 1 -5 in Piraeus, Greece

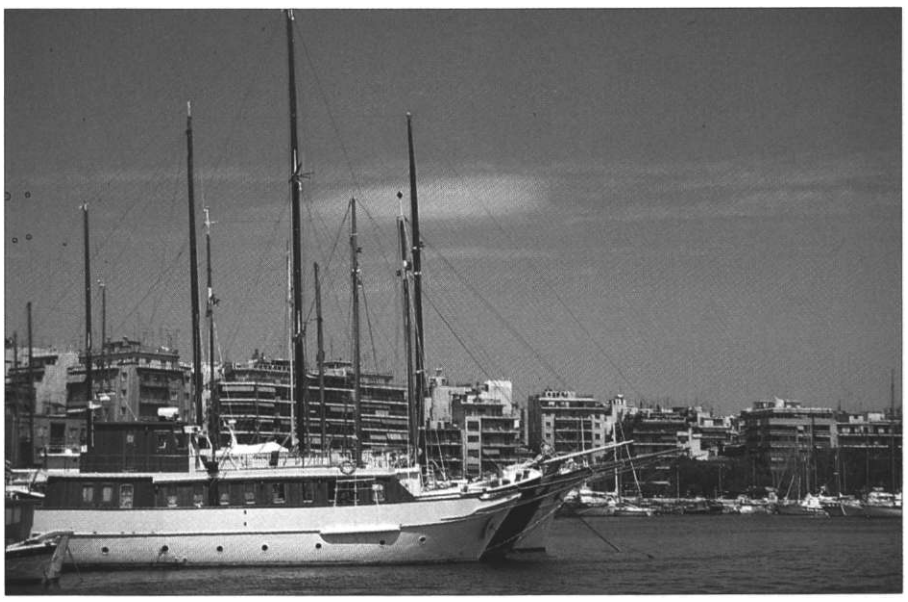
This year's edition of one of the largest and most popular international shipping exhibitions, Posidonia 92, will be held in the Piraeus Port Authority's waterfront exhibition center in Piraeus, Greece, from June 1 to 5, 1992. The exhibition will officially open on June 1 at 6 p.m. On subsequent days, the show hours will be 11 a.m. to 6:30 p.m.

Held every two years, Posidonia drew a total of 15,000 attendees in 1990, a substantial increase over the previous two shows held in 1986 and 1988, reflecting the upturn in the world maritime sector over the past several years.

Organizers of Posidonia 92 expect this year's show to be even larger than 1990—as much as 30 percent larger. In fact, the organizers have already negotiated additional exhibition space as prebookings for the international shipping exhibition point to record-breaking participation. More than 600 firms from 35 countries had, as of February, confirmed space in Posidonia 92.

In addition, another 400 firms are finalizing their area requirements and, in order to accommodate these companies, more space has been secured alongside the three-tier waterfront exhibition building. In all, about 1,100 companies from 543 countries will be represented.

"The extremely high interest in Posidonia reflects the industry's buoyant mood and we are proud of having the ability, through the exhibition and associated events, of helping keep the maritime world up to date with developments influencing the sector," said **Nana Michael,** Posidonia's managing director.



Microlimano, yacht harbor of Piraeus

Twenty-two national pavilions have been confirmed, with several others still under negotiation, surpassing Posidonia 90's record of 16 national pavilions.

The 22 national pavilions at this year's show will include: Brazil, Bulgaria, Cyprus, Republic of Croatia, Denmark, Finland, France, Germany, Italy, Japan, Malta, the Netherlands, Norway, Panama, People's Republic of China, Poland, Romania, Russia, Singapore, South Korea, the U.K., and the U.S.

The Greek presence is developing into the host country's most impressive showing, topping the presentation mounted at Posidonia two years ago. Many of the Greek stands will present recently developed products, especially in the field of research and technically advanced management systems.

Several exhibitors have indicated their intention of launching new products at the exhibition. The exhibits at the show will cover every facet of the maritime industry from ships' equipment suppliers and shipyards to high-tech office equipment and service companies, shipbrokers, finance institutions, insurance orgnaizations, mariners travel companies, port authorities, ship classification societies, inspection services, ship registries, publications and humanitarian services.

Interest is also running high in the Posidonia Forum, a traditional feature of the week. To be held on Thursday morning, June 4, proceedings are open exclusively to Posidonia exhibitors and to personalities invited directly by the organizers.

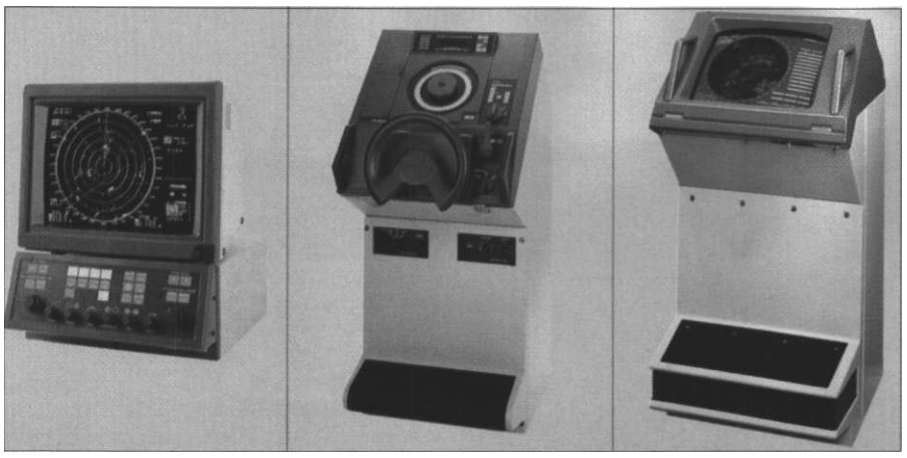
Sponsors of Posidonia 92 include: the Greek Ministry of Mercantile Marine, Municipality of Piraeus, Hellenic Chamber of Shipping, Union of Greek Shipowners, Greek Shipping Cooperation Committee, Union of Mediterranean Cargo Vessels' Shipowners, Greek Shipowners Association of Passenger Ships and the Association of Coastal & Passengership Owners.

For further information on the show, contact: Posidonia Exhibitions SA, 4-6 Efplias Street, 185 37 Piraeus, Greece; telephone: +30 1 4517859; or fax: +30 1 4538976.

POSIDONIA 92
Exhibitors

Aalborg Piraeus
ABB Stromberg Drives
Aegean Protective Coatings
AGIP Petroli
Alexandria Towing
Alfa Laval Engineering
ABS
Antwerp Diesel Pumps
Aqua Signal
Arno Dunkerque
Atlantis Engineering & Construction
Atlas Elektronik
Australian Ferry Builders Association
Avlis Shipyards
Batservice Industrier
BIMC0
BP Marine
Blohm + Voss
Bremer Vulkan
Brissonneau et Lotz Marine
British Telecom
Bureau Veritas
Burmeister & Wain Skibsvaerft
Canaveral Port Authority
Castrol Hellas
Centromor
Chris Marine
Chugoku Marine Paints
Comsat Maritime Services
Curacao Drydock Company
Daewoo Shipbuilding & Heavy Machinery
Diesel Power Holland
Deltamarin
Deutsche Maschinen und Schiffbau
Det norske Veritas
Drew Greece
Eleusis Shipyards
Energy & Marine International Services
Esgard Inf1 GmbH Corrosion Coatings
Exxon
Francis Searchlights
General Steamship Corp.
Germanischer Lloyd
Ghent Port Authority
Halla Engineering & Heavy Industries
H. Clarkson & Co.
Hellenic Shipyards
Hempels Marine Paints
Hitachi Zosen Corp.
Hitachi Zosen Singapore
Holland Marine Equipment
Hyundai Heavy Industries
IMCO Hellas
Ingersoll Rand
Inham Refrigeration
Inmarsat
Intermarine Electronics
International Maritime Organization
International Transport Contractors
Inventory Locator Service
Ishikawajima-Harima Heavy Industries
Jadranbrod
Japan Ship Exporters Associations
Kawasaki Heavy Industries
Kelvin Hughes
Keppel Shipyard
Kidde Graviner
Koninklijke Schelde Group
Korea Shipbuilders Association
KVS Ijmuiden
Leroy-Somer/Anastasios Trezos
Lincoln Diesels
Lips
MAC0R Marine Systems
MAN B&W Hellas
Marflex
Marine Turbo Engineering
Marioff
Maritex—Swedish Telecom Radio
Marpo
Metos Marine
Miba Gleitlager
Miller Limited
Mirrlees Blackstone
Mitsubishi Heavy Industries
Mitsui Engineering & Shipbuilding
Mitsui OSK Lines
Mobil Oil Hellas
Navicom Electronics Ltd./Anschutz
Naimar Greece
Neptun-Warnow-Werft
New Naval
New Sulzer Diesel
Nippon Kaiji Kyo Kai
NKK Corporation
North Shipyard (Pte)
Oceanking Maritime
Orkot Engineering Plastics
Oshima Shipbuilding
Panama Secnaves
Pan-United Shipping (pte)
Permalite Hellas
Proton Services Epe
Rochem Panhellas
Rockwool A/S
Rolls Royce
Royal Schelde
Samsung Heavy Industries
Sasebo Heavy Industries
Schichau Seebeckwerft
Schiffselektronik Rostock
Seaking
Sembawang Shipyard
SEMT Pielstick
Shell Company (Hellas)
Sigma Paints Hellas
Singmarine Dockyard & Engineering
Sperry Marine
Stena Data
Stolt-Nielsen Nederland
Stork Service
Sudoexport
Sumitomo Heavy Industrie
Thames Diesel
Unimar
USCG-AMVER
Unitor Ships Service
Vecom
Vera Shipping
Verlome Botlek
Veson Computer Systems
Volkswerft
Wartsila Diesel
Watercraft Hellas
Waukesha-Lips
Wilton Fijenoord
Wilson Walton Group
Wijsmuller Holding
Yankee Environmental Services

(Partial listing due to space limitations)



Tokimec Color Radar | Tokimec Autopilot | Tokimec RASCAR Radar

Tokimec's Marine Systems Division Offers Wide Range Of Navigation Equipment

Tokimec is the new name for Tokyo Keiki, a leading Japanese company in composite sensing technology. For almost a century the marine systems division of Tokimec has developed new and innovative products for commercial, luxury, leisure and fishing craft. Tokimec offers marine radars, gyrocompasses, autopilots, GPS navigators and RASCAR radar systems.

Tokimec's BR-1800 series rasterscan radars have automatic tuning and sea clutter suppression to provide simple operation. A newly developed MIC for the front-end of the receiver helps to keep a lower signal-to-noise ratio. IMO versions are available with a Gyro/Log interface unit and a passive type performance monitor.

Some of the gyrocompasses produced by Tokimec are the ES-series, the GM-20/2 land the TG-5000. The ES-series includes Type ES-10 which uses the master compass directly in steering without using repeaters and Type ES-11A which uses repeater compasses. This type of gyrocompass has been installed on over 20,000 different vessels since it came on the market.

The GM-20/21 is one of the world's smallest gyrocompasses featuring a syncro output, which can be used to drive the Tokimec PR-1000 steering control. The GM 20/21 is made up of a master compass which is ideal for operators of small commercial vessels and fishing boats due to space limitations.

The TG-5000 gyrocompass is primarily for medium to large ship installations and conforms to IMO standards. The master compass and a transmission box make up this unit. It is reported to be easy to operate since there is only one control switch and speed error is automatically corrected. This series also offers other desirable features such as emergency back-up functions and an extensive repeater circuit.

The Tokimec PR-8000 autopilot conforms with the recommendations of SOLAS, the IMO, and the rules and regulations of many countries and classification societies. Each unit can be customized to fit aboard a particular vessel with its functional units mounted either into the stand-alone system or into console and cockpit configurations. The unit provides two steering modes which are the adaptive mode, which uses the Model Reference Adaptive Control System (MRACS), and the PID mode which enhances the stability and accuracy of course functions through a new control system.

The GR-1000 GPS navigator has a continuous fix mode with a multichannel receiver that can give complete position fixing. The display gives navigational as well as simple plot functions. The unit also gives various types of navigational data such as waypoint and time to go to a destination. Any desired route can be set and changed with a print out of the information if desired.

The RASCAR radar system has touch-screen capabilities which eliminate the need for additional buttons and knobs. The radar offers a variety of features as well as many optional functions to make operation easier.

For more information and a free brochure detailing the products offered by Tokimec,

Circle 12 on Reader Service Card

Jeffboat To Build 10 Tank Barges For Mobil

Jeffboat, Inc., Jefferson ville, Ind., has begun construction of ten 240-foot double-hull tank barges for Mobil Corporation, Fairfax, Va. The construction contract is valued at about $10 million.

To be used on the Mississippi River and inland waterways for the transportation of crude and oil products, the tank barges will have a beam of 54 feet and draft of 9-1/2 feet. The barges will be fitted with the latest vapor recovery and inert gas systems, cargo gaging and level monitoring and alarm equipment. The vessels will replace single-skin barges currently being operated by the Marine Transportation Division of Mobil. The new double-skin barges are expected to be delivered and in operation by the end of this year.

Mobil's Marine Transportation Division moves over 100 million barrels of crude oil and other products in the inland and coastal waters of the U.S.

For free literature on the boat and barge building services of Jeffboat,

Circle 110 on Reader Service Card

1000th SCHOTTEL Transverse Thruster Installed On Trawler

The 1000th Schottel transverse thruster will be installed into the bow of a trawler at the ASENAV yard in Chile. The STT-170 LKT thruster is rated at 184 kw at 1,470 rpm. The trawler will also receive a second Schottel transverse thruster, an STT-330 LKT, in its stern.

Schottel is one of the world's leading manufacturers of azimuthing propulsion units and maneuvering aids, with its transverse thrusters covering a power range from 30 to 1,650 kw. Units rated at 500 kw or higher are available with either fixed-pitch or controllable-pitch propellers.

Introduced in the 1960's, the Schottel transverse thruster have been operating successfully worldwide in vessels of varying sizes and types. The Schottel pressure-equalizing tunnel, known since 1970 as the Anti-Suction-Tunnel, or AST, was also a major improvement to vessel maneuverability.

For further information on Schottel's transverse thruster or AST,

Circle 89 on Reader Service Card

Port Of South Louisiana Plans To Turn Riverplex Into Intermodal Facility

The 205-acre Riverplex International Inc. terminal in Louisiana is to be turned into an intermodal cargo-handling facility by the Port of South Louisiana, which recently paid $12.1 million to purchase it. The terminal will be renamed Globalplex.

The terminal has handled dry bulk cargoes for the past four years, ranging from minerals to wood chips. The Port of South Louisiana plans a five-phase renovation that will enable the facility to handle general and neo-bulk cargoes.

Included in the Riverplex facility are an industrial park, foreign trade zone, 454 feet of wharf, two major rail links, about 300,000 square feet of warehouse, gantry cranes, three 80-foot silos, a water treatment plant and a conveyor system.

The Port of South Louisiana will spend $2.4 million on dock extensions to allow the complex to berth two vessels at once. Another $3.1 million will be spent to install an automated ship-loader as well bagging facilities.

Centurion Seaport Systems Inc. of New Orleans was hired by the port to manage the facility.

Louisiana's No. 3 commodity is forest products, the bulk of which moves not through Louisiana ports, but through Mobile, Ala.

North Sea Operators Evaluating New Rig Concept For Long-Term Programs

A new jackup concept, capable of drilling and production operations in more than 100 meters (about 328 feet) of water, is being developed by the rig designer Marathon LeTourneau of Texas, with **Christiann Kongsli** and **Normann Riksen,** the Norwegian rig experts. Talks are under way with potential users and investors, with the ultimate goal of securing a long-term contract for the $100 million to $150 million unit.

Other concepts have been offered to the offshore industry before, but the designers feel that their rig has an upper hand over the competition because of the attention given new technical regulations and commercial requirements in Norway and the U.K.

Larger jackup concepts, dubbed TPG 500 and Seagull, respectively, have been designed by Technip Geoproduction in Paris, and Odfjell Drilling & Consulting Company in Bergen. These units are directed toward contract production work in water depths of as much as 160 meters (about 525 feet)

The fabrication price for the Marathon rig, somewhere between $100 million and $150 million depending on final specifications, would be well below that of the Seagulf or TPG-500, estimated to cost $250 million and $170 million, respectively, Mr. **Riksen** and Mr. **Kongsli** contend.

Boat Workers Rally For Luxury Tax Repeal

About 400 people consisting of boat workers, Senators and Congressmen rallied on the center steps of the U.S. Capitol Building to urge Congress and the White House for the immediate repeal of the luxury tax, which has severely hurt the U.S. boatbuilding industry.

The boat excise tax, intended to affect only the wealthy, has resulted in the loss of 20,000 to 25,000 mostly blue collar jobs nationwide in the boat manufacturing industry. The revenue negative tax has also caused many small, family-owned businesses to shutdown.

Although Congressional and White House proposals call for the repeal of the luxury tax on boats, the repeal has not yet occurred, and Americans are still either unemployed or close to losing their jobs in these industries.

Senators **John Breaux** (D-LA), **John Chafee** (R-RI), **Bill Bradley** (D-NJ), **Daniel Patrick Moynihan** (D-NY), and Con. **David Bonior** (D-MI) were among the legislators attending the rally. Boatbuilders from Maryland, New Jersey, New York, Pennsylvania, North Carolina, and other states took part in the event.

EUROPEAN WORKBOAT SHOW

On-Water Exhibition Set For June 23-25, 1992

Designed specifically for the small commercial craft industry, the 3rd European Workboat Show, which has developed into one of the largest exhibitions of its kind in Europe, has been scheduled for June 23-25, 1992, in the Port Solent development in Portsmouth, the United Kingdom.

The organizers of the show, National Boat Shows Ltd., have targeted a wide range of leading workboat and associated equipment companies to insure that the event becomes firmly established as the European showcase for this important industry sector.

Held in Port Solent in southeast England since its inception in 1990, the European Workboat Show is an "on-water" exhibition, enabling commercial craft to be demonstrated. This year, the organizers are anticipating about 200 exhibitors for the show, with about 80 boats afloat, which would make the exhibition one of the largest of its kind in Europe. As of press time, firm commitments from 167 exhibitors and 50 vessels had been received.

Among the commercial craft that will be on exhibit are patrol boats, rigid inflatables, inshore fishing boats, harbor launches, tenders, small ferries, rescue craft, general utility craft, police and customs craft, small military craft and specialist commercial craft, with sizes ranging up to 130 feet.

Engines, deck and cabin equipment, electronics materials, radar, safety equipment and steering systems are just a few examples of the range of equipment that will also be on display.

During the 1991 show, the exhibition attracted over 5,000 trade visitors from 39 countries.

David Hough, managing director of National Boat Shows Ltd., said: "We are very encouraged by the industry's response to this the 3rd European Workboat Show. Even at this early stage, there are clear indications that the event is well on the way to further expansion and even stronger European presence in 1992. Given that we are all working towards a single European market, this can mean nothing but good."

Boat manufacturers Avon, Taskforce Boats, FBM Workboats, and Port Isaac Workboats will be among the exhibitors. Additionally, boatbuilder Damen Shipyards, making its debut at the show, plans to display its fisheries patrol vessel, along with a selection of tugs, launches and related workboats. The 21.9-meter (about 72 feet) Damen Stan Patrol vessel is the largest boat to date on exhibit. Taskforce Boats also will display a new high-speed patrol version of its Trihedral Workboat, the model TF650, with an inboard and diesel engine together with a unique Taskforce air collar system.

Lips BV, ZF Gears, Ultra Hydraulics, Deutz MWM, Volvo Penta, Deere Power Systems, and Caterpillar Overseas will be among the propulsion system components manufacturers exhibiting. Caterpillar Overseas, for example, plans to launch three new marine engines—a 6.6 L model with a stern drive unit; a 10.4 L model with a Vee-drive transmission; and an 18 L model.

Robertson Autopilots, Autohelm, and SP Radio will be part of the navigation and communications contingent at the show.

For further information on the European Workboat Show, contact: National Boat Shows Limited, The Coach House, Rownhams House, Rownhams, Southampton S01 8AH United Kingdom; telephone: (+44) 703 737311; or fax: (+44) 703 736840.

European Workboat Show Exhibitors

Admiralty Charts
Airmax
Amgram/Camarc
Amphibious Vehicles
Anglo-Dutch Engineering
Aqua-Star Workboats
Autohelm
Avon Inflatables
BMIF
Beneteau UK
Berthon Boat
Blakes Marine Paints
Branchsound Ltd.
Brookely Maritime
Brookes & Gatehouse Ltd.
Bruntons Propellers
Burmac
C-Mac Industries
Carisbrooke Marine
Castrol Marine
Caterpillar Oversaes
Celtic Developments
Centigrade Control
Cetrek Ltd.
Cheetah Marine Catamarans
Chinook Inflatables
Cleghorn Waring
Crescent Shipyard
Crewsaver
Cummins Marine
Damen Shipyards
Datacraft Europe
Deere Power Sysatems
Delta Rigid Inflatables
Deutz MWM
Dorman Diesels
Dredging & Port Construction
EEV Limited
EP Barrus
Esso Petroleum
European Marine & Machinery
FL Steelcraft
FBM Marine
Geko Power UK
Graseby Dynamics
Great Eastern Marine
Griffon Hovercraft
Gunter Marine Services
Halmatic
Halyard (M&I)
Harold Hayles
Henri-Lloyd
Hercules Hatches
Heron Suzuki
Honda Marine
Houdini Marine Windows
IC0M UK
Iveco Aifo
JS Mouldings
Jetfloat UK
John Brown Design
Lilley & Gillie
Lochin Marine Boatbulder
MG Duff
Marine Electrics GRP
Maritime Reporter
Marshall Branson Marine
Mercruiser Inboards
Mercury Outboards
Mermaid Marine Engines
Modular Mouldings
Monk Optics
Murray Cormack Associates
NCS Marine
Navico
0MC (UK)
Ocean Dynamics
Palfinger Hebetechnik
Paul Corbett
Pepe
Performance Workboats
Perkins
Port Isaac Workboats
Portmere Rubber
Pyser-SGI
RG Parker (Eng)
Racal-Decca Service
Robertson Autopilots
Rosyth Royal Dockyard
RTK Marine
SG Brown
Sabre Engines
Seasafe
Seatite Hatches
Ships Electronics
Steyr Power Technology
Super Marine Power
Swath Ocean International
Tamesis Boats
Taskforce Boats
Technix Rubber & Plastics
Thorness Boats
Thornycroft Engines
Typhoon International
Tyrell Shipyards
Ultra Hydraulics
Volvo Penta
Voyager Yachts
Wagner Engineering
William Osborne
Yamaha
ZF Great Britain

I He refurbished 1,400-passenger, Pielstick-powered Eurocruiser Sally Albatross, recently delivered by Finnyards Ltd.

Largest Cruise Liner Ever Built At Finnyards Delivered To Sally Line

The "reborn" 525-foot-long Sally Albatross, the largest cruise liner ever built at Finnyards Ltd., the Finnish shipbuilder, was recently delivered to Finnish owner Oy Sally Line Ab of Helsinki.

Through a unique approach, the submerged part of the previous Sally Albatross, including her main engines and propellers, was used in constructing the new vessel. This formed the foundation for a completely new, streamlined ship, and cut production time to 20 months.

Following ceremonies at the Rauma, Finland, shipyard, the Sally Albatross departed on her maiden cruise to her homeport of Mariehamn in the Aland Islands, where she then sailed to Helsinki. The Sally Albatross will normally operate in the Baltic Sea, offering 24-hour cruise service. During the summer, the vessel will sail to the island of Visby and to St. Petersburg.

The 10-deck, six passenger deck vessel has a beam of 83 feet, draft of 18 feet and gross tonnage of 25,000. With 550 cabins, most of which have an ocean view, the Sally Albatross has a passenger capacity of 1,400. New cabins were provided by Parma Marine. The "Eurocruiser" has public areas totaling about 5,400 square meters (about 58,104 square feet), including three restaurants, a 600-seat show lounge, a night club, a large 450-seat conference space, casino, health and fitness center, sauna, and hospital.

Built to Det norske Veritas class, the Finnish-flag, twin-screw ship has a specially strengthened steel hull for ice navigation. She is propelled to a cruising speed of 21 knots by four Pielstick 12 PC2.5V diesel engines and controllable-pitch propellers. Total output of her main engines is 19,120 kw (25,640 hp). Electrical power is supplied by three Wartsila Vasa 6R32 diesel generators, with a total output of 6.2 mw.

Interior work on the vessel was supplied by Danish company A/S Henning Frokjaer and Finnish companies Loipart Oy, Merima Oy, and Oy Shippax Ltd. New galleys, pantries and bars were supplied by Electrolux Marine of Sweden. HVAC was supplied by Sweden's Flakt Marine and new passenger and service lifts were installed from MacGregor-Navire (Denmark) A/S. Finnmast Oy and Elomarine Ltd. provided construction services.

The Swedish Olympiabaten foundation has chartered the Sally Albatross to provide a base for its export promotion project at the Barcelona Olympics this summer.

For details on the shipbuilding services of Finnyards Ltd.,

Circle 26 on Reader Service Card

Color Brochures On Marine Control Systems From Kobelt Manufacturing

Kobelt Manufacturing Company, of Richmond, Canada, is offering three color brochures that fully describe the company's line of push/pull, mechanical, pneumatic and electronic controls for marine applications. The company also manufactures hydraulic steering gear up to 80 metric tons and disc brakes for propeller shaft brakes and winch applications.

Kobelt's brochures are well designed, each consisting of over 30 pages showing both a full photograph and a schematic diagram of each of the company's products. The text included with each item provides all the necessary characteristics and tolerances. In most cases, the brochures also give detailed product installation instructions and drawings that show various installation options.

To obtain further details on Kobelt's product line and to request the company's free brochures,

Circle 68 on Reader Service Card

A GUIDE TO U.S. MARINE SALES IN THE NEXT FIVE YEARS

NEW 1992 EDITION

FIVE YEAR OUTLOOK FOR THE U.S. MARINE INDUSTRY

An Assessment of Ship Construction and Major Modification Prospects Available to Shipbuilders, Equipment Manufacturers and Other Suppliers

Report No. 7119 - $575.00 per copy

The totally new, **1992 edition** of IMA's marine industry outlook has just been published. Under one cover is a totally objective, in-depth assessment of the business outlook for the entire U.S. marine sector. The report documents the size and composition of 24 individual market segments, analyzes underlying market drivers, forecasts construction and modification activity over the five years, identifies regulatory and legislative actions likely to affect future suppliers.

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- Production and Power Platforms
- Sunken Tube Tunnel Sections

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Circle 227 on Reader Service Card

Comex Services To Be Purchased By Stolt Tankers/Terminals

An agreement was recently signed for the purchase of Comex Services S.A., a subsidiary of Comex S.A., by Stolt Tankers and Terminals. The purchase agreement is for $30 million in cash and 750,000 Stolt shares, plus the assumption of $37 million debt.

Comex Services S.A. is an underwater services contractor specializing in the offshore market. Comex's presence is reported to be especially strong in the North Sea, South America, Asia Pacific, West Africa, the Mediterranean Sea and the Middle East.

Stolt Tankers and Terminals plans to combine the operations of Comex and Stolt-Nielsen Seaway.

APL Opens Subsidiary Company In Mexico City

American President Lines (APL) recently announced that it has opened a subsidiary company in Mexico City. The opening of the company was reported to be in anticipation of the projected US-Canada-Mexico free trade agreement, as well as to consolidate operations within the country.

The company, APC de Mexico, has offices in Guadalajara, Monterey and Laredo, Texas and is headed by APL's former Thailand manager **Tom Olsen.**

Hempel And DNT Sign Agreement To Expand Paint Sales

Hempel's Marine Paints and Dai Nippon Toryo (DNT) recently reached an agreement which should expand Hempel's sales in Japan and give DNT access to Hempel's worldwide network in sales and distribution. The initial agreement will involve marketing of marine paints and sales to overseas industrial projects. Future plans for the two companies are to exchange technical data and to further develop environmentally-friendly coatings.

DNT is one of the largest paint manufacturers in Japan, specializing in heavy duty coatings as well as various specialty coatings.

Hempel's is based in Denmark and is presently one of the largest marine paint companies in the world, consisting of over 40 subsidiaries throughout the world. Hempel's was one of the first companies to introduce tin-free antifoulings and water-borne anticorrosion coatings for containers and heavy industry. The company specializes in marine paints as well as manufacturing container and offshore coatings.

For further information,

Circle 25 on Reader Service Card

Bender Inc. Introduces New Portable Ground Fault Current Instrument

Bender Inc. of Exton, Pa., recently introduced its new RCT 3000 portable ground fault current instrument. The hand-held unit can reportedly detect current leakage as low as 1 mA and operates through the use of a nickel-cadmium battery. The unit is said to have an accuracy of 1 percent of the measured value which is read out on a 4-1/2 segment LCD display. The unit is equipped with a visual and audible alarm that will sound when the measured current exceeds a set reading which is adjustable over the range 0-9,999 mA.

The unit can also be mounted with clamps which are available in different sizes up to 4-inches throat diameter. A larger size clamp is able to accommodate up to three 400 MCM conductors which would allow leakage currents in 3-phase/460V motor circuits up to 300 hp to be determined.

For more information about the RCT 3000 ground fault current instrument from Bender Inc.,

Circle 27 on Reader Service Card

40th Annual Ft. Schuyler Forum Focuses On Marine Refrigeration And Diesel Engine Performance

Principals at the 40th Annual Fort Schuyler Forum (L to R): **Eugene R. O'Rourke,** president, Society of Marine Port Engineers; **George Murphy,** past president and chairman of the board, Society of Marine Port Engineers; **David J. Allen,** Bailey Refrigeration Co.; Prof. **Jose Femenia,** engineering department, SUNY Maritime College, and second vice president, Society of Marine Port Engineers; **Benjamin A. Bailey,** president, Bailey Refrigeration Co., and secretary, Society of Marine Port Engineers; **Herbert Roeser,** president, Trans-Marine Propulsion Systems; **Ken Arntzen,** Unitor Corporation; **Terje Wennberg,** engineering manager, Trans-Marine; and **Ted Atwood,** Allied Signal, Inc.

The Society of Marine Port Engineers, New York, N.Y., Inc., and the State University of New York Maritime College recently co-sponsored the 40th Annual Fort Schuyler Forum. Held on the SUNY Maritime College campus in the Bronx, the forum focused on marine refrigeration and diesel engine performance.

Chairman for the event was **John Antonetz** and co-chairman was Prof. **Jose Femenia.** Professor **Femenia** also served as the moderator for both of the forum's morning and afternoon sessions.

The morning session opened with a welcome address by Rear Adm. **Floyd H. Miller** (Ret.), U.S. Navy, president, SUNY Maritime College at Fort Schuyler.

The three presentations during the early session were: "Meeting the Challenge," by **Ted Atwood,** Allied Signal, Inc.; "Adapting Existing Shipboard Systems to the New Refrigerants," by **Benjamin A. Bailey,** Bailey Refrigeration Co., Inc.; and "Container Refrigeration Systems for the Turn of the Century," by **Charles Sciullo,** Carrier Corporation.

Following lunch, **Eugene P. O'Rourke,** president, Society Marine Port Engineers, presided over the afternoon session. The presentations during the session included: "Recovery, Recycling and Reclaiming of Refrigerants," by **Ken Arntzen,** Unitor Corporation, and "Effects of Ambient Changes on the Performance of Diesel Engines," by **Herbert Roeser,** Transmarine Propulsion Systems.

Electronics Update

Alden Electronics Introduces New Navtex AE-900 Receiver And Faxmate II Weather Chart Recorder

Alden's Navtex AE-900 receiver

Alden Electronics, Inc. recently introduced their new Navtex AE-900 receiver and the Alden Faxmate II Weather Chart Recorder.

The AE-900 automatically receives all navigational notices, weather warnings, and search and rescue messages as required by the worldwide Global Maritime Distress And Safety System (GMDSS). The receiver can reportedly store up to 30 messages over a 68-hour period with a reception distance of400 miles offshore.

A high speed, silent thermal recording printhead is used to produce radio telex messages. The unit is also equipped with an audible and visual alarm to alert users of incoming search and rescue messages.

Navtex is an internationally adopted, automated system for broadcasting informational messages, warnings and notices affecting all mariners.

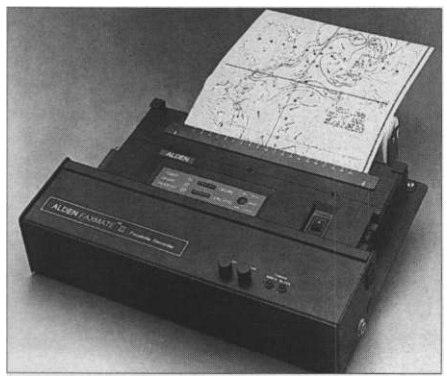
The Faxmate II is designed to operate at 12 VDC and is available with an optional inverter for AC operation. The recorder can also function as a computer printer. It is designed to operate with any HF single sideband or ham radio and provides mariners with weather and oceanographic charts. The charts indicate predicted speed and direction of storms or can aid fishermen by showing the warm and cold water eddy areas.

For further information detailing the Navtex AE-900 receiver.

Circle 9 on Reader Service Card

For literature describing the Faxmate II Weather Chart Recorder,

Circle 121 on Reader Service Card



Alden's Faxmate II Weather Chart Recorder

Alfa-Laval Equipment On New Icebreaker For FBN

Finnyards is building a new multipurpose icebreaker which is to be commissioned by the Finnish Board of Navigation in cooperation with Ugland Offshore AS. The vessel is 377.3 feet long with a large afterdeck and accommodations for 82 people. These features will make the ship suitable for offshore gas and oil field activities during the summer months.

The vessel will have a speed of 8 knots in 2.6 feet of Baltic ice and can cope with Arctic ice up to 5.9 feet thick. This new icebreaker will replace the Tarmo class ships which are now almost 30 years old.

Alfa-Laval Industri Oy is supplying two FOPX 613 for HFO, one FOPX 607 for MDO, four LOPX 707 for LO, plate heat exchangers and a freshwater generator.

Alfa-Laval is headquartered in Sweden and is a major supplier of oil treatment, central cooling and freshwater production systems to the marine and power industries worldwide.

For more information about Alfa-Laval products,

Circle 11 on Reader Service Card

NEI Syncrolift Receives Three Orders For Shiplifts And Transfer Systems

NEI Syncrolift, Miami, Fla., has received three more orders for shiplifts and transfer systems. The systems are to be installed in the United States, El Salvador and Hong Kong.

Scott Paper, Mount Vernon, Ala., is equipping its new yard with a 1,450-ton capacity Syncrolift which will be used to service the fleet of tugs and barges owned by the company and used for transporting its forest products. The new platform is being fabricated by Scott Paper, and will be 200 feet by 50 feet. Ten hoists will be installed by Syncrolift, each having a capacity of 183 tons. The hoists, which were built in 1974 for the Greek Navy's Salamis installation, are being refurbished before being installed on the Scott Paper unit. The hoists became available when the Salamis installation was upgraded with larger units.

This 2,400-ton shiplift at Aratu Bahia, Brazil, is typical of the smaller NEI Syncrolift units like those contracted in Hong Kong, El Salvador and the United States.

The Salvadorean Navy has ordered a 260-ton unit to be installed at PuntaRuca, El Salvador. The lift will be used to service fast patrol craft. Construction of the shiplift will be supervised by the U.S. Army Corps of Engineers and will include a 98.4-foot by 32.8-foot platform with four 91-ton hoists.

Ocean Shipbuilding of Hong Kong is relocating its facilities, and because the new location has a limited amount of space, Syncrolift will provide the company with a shiplift that has the ability to use a custom-designed transfer system. The shiplift will include a 147.6-foot by 49.2-foot platform and six 244-ton hoists.

For literature and information detailing the Syncrolift shiplifts,

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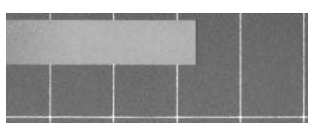

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New U.S.-Singapore Joint Venture Ship Management Firm

A new joint venture ship management company has been formed by Singapore-based Sembawang Johnson Management and New York-based International Marine Consultants (IMC).

The new joint venture will be called New World Shipping, and will be a 50-50 partnership. Managing a fleet of 66 vessels, New World Shipping will be based in Singapore, with offices in Houston, San Francisco, and Mineola, N.Y.

The new firm plans to expand its business ties with trading companies and owners, especially those operating between Southeast Asia and North, Central and South America.

Services offered by New World Shipping will include ship management and operations, as well as technical planning, development, maintenance and repair programs.

Russian Research Ship To Work For West

Under an agreement between a United Kingdom company and Russian organizations, a former Soviet vessel is undertaking a month's research cruise off South Africa under contract to the University of Cape Town.

The 5,700-ton-displacement Professor Logachev will carry out a wide range of geophysical research in the Natal Valley between the east coast of South Africa and the Mozambique Ridge.

The cruise is the first to take place under agreements reached between GeoMarine Ltd., UK, and Russian organizations to provide multipurpose geophysical, geotechnical and oceanographic vessels for charter or collaborative research projects with Western organizations.

Charter arrangements such as this provide the Commonwealth of Independent States with much-needed hard currency, while offering Western organizations the opportunity to acquire high quality oceanographic and seismic data at competitive rates.

Glass Beads Demonstrated As Quick, Low-Cost Tool For Oil-Spill Cleanups

Chemists attending the recent national meeting of the American Chemical Society agreed that the most effective techniques for cleaning up huge oil and chemical spills quickly and relatively cheaply will probably involve combined approaches exploiting solar energy, bacteria and mechanical agents like glass beads.

The combined use of hollow glass beads about the thickness of human hair, with coatings of titanium dioxide, is a particularly promising weapon against large oil spills, its developers said.

A convincing demonstration for those at the meeting was conducted by Dr. **Adam Heller** of the University of Texas at Austin. Using a glass dish filled with clear water, he poured on a layer of crude oil of the type that fouled Prince William Sound in Alaska three years ago. Next, he poured a few teaspoons of sand-like glass bubbles on the spill. The oil almost instantly combined with the floating bubbles, congealing into floating chumps and leaving the rest of the water surface completely free of oil.

The chumps, unlike thin layers of oil, could be easily ignited with a match, burning away the volatile light hydrocarbon compounds, which are particularly toxic. In sunlight the beads can oxidize hydrocarbons from oil spills that adhere to them, rendering the remaining oil components soluble in water. Once dissolved, Dr**.Heller** said, such compounds are quickly attacked and destroyed by the natural bacteria in seawater.

Dr. **Heller** said he believed the method to be capable of mopping up an oil spill the size created at Prince William Sound in three days for about $ 75 million, about 5 percent of the cleanup cost paid for cleanup in Alaska.

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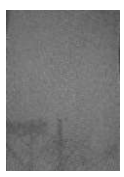

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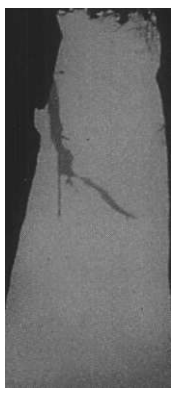

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VecTwin Ship Control System Installed On Great Lakes Tug

The VecTwin ship control system was recently installed aboard the Great Lakes tug, Olive L. Moore. The tug was converted for dual-mode integrated tug/barge (ITB) operations. The vessel has since been put back into service in northern Lake Michigan with the barge McKee Sons.

VecTwin ship systems provide independent movement of twin Schilling rudders and reportedly costs less than a controllable pitch propeller and conventional rudder. The system operates with a single joystick control which allows each rudder to be angled differently and to modulate propeller slipstream in any direction, including reverse.

The VecTwin system was also recently installed aboard the Antarctic research vessel, Hesperides.

For further information about the VecTwin control system supplied by Hamworthy Industramar,

Circle 122 on Reader Service Card

Texas, MSRC Sign Research Agreement

The State of Texas and the Marine Spill Response Corporation (MSRC) have signed a unique agreement that will lead to joint funding and decision-making on research in effective oil spill cleanup and coastal protection.

F. Rainer Engelhardt, vice president for research and development for MSRC, and **Garry Mauro,** commissioner of the Texas General Land Office (TGLO), signed a memorandum of understanding between the two organizations.

"The State of Texas and MSRC have parallel interests in spill response research and development," said Mr. **Engelhardt.** "This agreement will enable us to work jointly on projects where our interests overlap and will help prevent expensive duplication of effort."

Family Vacation Rebound Expected This Summer By Premier Cruise Lines

Because people who had forsaken vacations last year on account of the recession are packing and planning to take one this year, the official cruise line of Walt Disney World—Premier Cruise Lines—expects to serve more than 30,000 families aboard its Big Red Boats this summer.

The number of people taking family vacations is expected to rebound this year to 94 million adults, up from 86 million in 1991, because of the demand, according to a recent survey by the U.S. Travel Data Center.

And of 37 percent of respondents who said they will visit a theme park this year, half plan to visit Walt Disney World. A part of this increasing market will be captured by Premier's Cruise and Disney Vacation plan which includes a three- or four-day vacation at Walt Disney World.

Premier Cruise Lines' Big Red Boat Cruise and Disney Vacations combine a cruise to the Bahamas with a vacation at Walt Disney World, including accommodations at a Walt Disney World resort.

Amoco Gives McDermott Go-Ahead To Begin Azeri Oil Field Study

McDermott International chairman **Robert Howson** recently announced that the company has been given the go-ahead by Amoco Corp. to begin a feasibility study that could lead to the development of the giant Azeri oil field in the Caspian Sea off Azerbaijan.

The field is estimated by Amoco to contain reserves of more than 1.5 billion barrels of crude.

Last June, Amoco won the right to negotiate an agreement to conduct the feasibility study. Officials from Azerbaijan were in Houston recently for talks with Amoco aimed at putting that agreement in final form.

Cruise Vessels To Be Built In Agreement Between McDermott/Swathtech

A letter of intent to construct a series of U.S.-flag SWATH cruise ships was recently signed by McDermott Marine Construction of Morgan City, La., and Swathtech America of Ft. Lauderdale, Fla., and now it has been reported that a contract may be signed to build four vessels. The vessels would be U.S.-flagged and will cost about $100 million to $200 million.

The 256-foot long vessels are designed as seagoing entertainment centers which could carry up to 1,000 passengers. The design also allows for dining, dancing and gaming onboard the vessel.

SWATH vessels are reportedly "sea friendly" because the design reduces the amount of pitching and rolling motion which allows for greater passenger comfort.

Swathtech America is a venture consisting of First Trustmark Corporation, John J. McMullen Associates, Inc. and Adolfo Bertolotti. The company specializes in financing, design, construction and turnkey delivery of American-built SWATH vessels for buyers around the world.

McDermott Marine Construction is part of McDermott International, a leading worldwide energy services company. The company and its subsidiaries provide engineering and construction services to the oil and gas industry, offshore, and for utility and industrial facilities onshore. McDermott also manufactures steam-generating, environmental, defense and aerospace products, and designs, and builds ships.

Engine Efficiency Assoc., A Division Of EMS, Delivers 6 ACCU Systems

Engine Efficiency Associates, a division of Electronic Marine Systems Inc. (EMS) of Rahway, N.J., recently delivered the last of six ACCU systems to Sheridan Transportation. The two-year refit program took place in four different shipyards in both the U.S. and Europe during regularly scheduled yard periods.

The design of the system allowed the 14-foot modules to be brought through a 15-inch door frame and reassembled in place. Other design features, as well as installation techniques, reportedly made the upgrade to ACCU affordable for the first time.

EMS is also manufacturing Tracor Marcon Automation Products in Bellevue, Wash. EMS/Marcon, as the product is now called, will continue to be marketed and supported worldwide.

For further information detailing the ACCU system,

Circle 66 on Reader Service Card

For free literature describing EMS/Marcon products,

Circle 109 on Reader Service Card

Amclean Develops Multi-Nozzle Waterjet —Free Video Offered

Amclean, Inc., a Miami-based coatings removal contractor, has developed an advanced waterjet system that can reportedly remove coatings more rapidly than traditional sandblasting techniques.

Amclean claims the system can save shipyards as much as 50 percent per square foot as compared to sandblasting. Disposal costs are reportedly reduced by 80 percent, while blasting dust and airborne debris is eliminated.

Amclean's one-man multi-nozzle system is said to be capable of removing 1,500 square feet of coating down to white metal in one hour.

Dennis McGuire, Amclean's director of operations, said, "There are at least a half dozen shipyards in the United States that Amclean could trim a million dollars each from their sandblasting expense."

For a free video on the Amclean coating removal process, send a request on your company letterhead to: Amclean Inc., 12920 SW 99th Avenue, Miami, Fla. 33176, or

Circle 38 on Reader Service Card

C. Plath Offers Free Color Brochure On Navipilot V

A free color brochure entitled, "A Milestone in Autopilot Technology," details the Navipilot from C. Plath.

A general purpose, multi-function, microprocessor-controlled autopilot, the Navipilot V is suitable for application on all classes of ships ranging from yachts to supertankers.

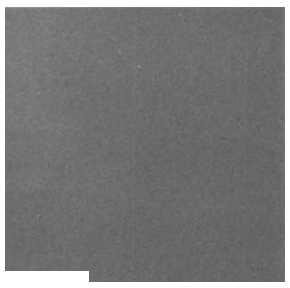
The brochure has an actual size full-color photo of the Navipilot V, showing the unit's easy-to-read liquid crystal display and logically arranged keyboard.

A maximum of 20 remote autopilot repeaters can be connected to the master autopilot control unit, according to the brochure. Other features reported in the literature include: gyrocompass, magnetic compass and electronic compass inputs; independent off-course alarm; analogue output for thruster control, rudder propellers and waterjets; and automatic changeover to corrected magnetic compass heading if the gyrocompass input fails.

The back panel of the brochure provides extensive details on technical data for the unit.

For a free copy of the brochure detailing the Navipilot V,

Circle 40 on Reader Service Card



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New MSI-Operated Rotterdam Research, Training Center

Dr. **Bram Paper,** Mayor of Rotterdam (right) and **Al Ueltschi,** president of FlightSafety/MarineSafety International, toast the recent joint venture agreement to sponsor a maritime research and training center in the Port of Rotterdam.

Marine Safety International (MSI) and the Municipality of Rotterdam announced a joint venture to establish a world-class maritime research and training center in Rotterdam, the Netherlands.

The center, to be managed and operated by MarineSafety International Rotterdam B.V., will house six state-of-the-art electronic simulators. They will be used for research related to harbor improvements and vessel safety as well as training of ships' officers, harbor pilots, cadets and vessel traffic controllers.

The joint venture document was signed by Dr. **Rene Smit,** Rotterdam vice mayor and alderman for the port, and **Albert Ueltschi,** founder and president of FlightSafety/MarineSafety International.

Mr. **Ueltschi** commented on the long tradition of excellence his company has earned over its 40 years in the simulator training field. He said: "We plan to work with our friends in Rotterdam to make this center the focal point of maritime research and training in Europe and the world."

Pieter Struijus, the Port of Rotterdam's executive director for shipping, noted, "The establishment of such an advanced center is in keeping with Rotterdam's aim of being an integral logistic transport center."

The MarineSafety Rotterdam Center will be comprised of three ships' bridge simulators, two radar/ARPA bridges and a multi-station Vessel Traffic System (VTS) simulator.

One of the bridge simulators will have a 360-degree field of view and be on a hydraulically driven motion base to simulate the effects of sea state on the ship.

The Rotterdam Simulator Research and Training Center will be located in the Port of Rotterdam and is planned to be operational early in 1993.

For free literature detailing the simulator training services of MSI,

Circle 39 on Reader Service Card

Guam Set To Become Key U.S. Military Outpost In Pacific

After the Philippine senate rejected a treaty that would have extended U.S. rights to Subic Bay naval base by 10 years, the Department of Defense (DOD) began planning a build-up on Guam that will eventually turn the island into the region's central supply, communications and arms depot.

Because of its geographic proximity to Asia, the United States has relied on the Philippines as a major naval, and later air, base for almost a century. Particularly after the rise of Soviet and Chinese power in the area at the end of World War II, Subic Bay and Clark Air Base became the cornerstones of American defense policy in the Pacific.

Noting the effect that the move further east to Guam will have on U.S. strategy in the western Pacific, Navy spokesman Lt. **Dave Wray** said: "We lost 1,500 miles there." However, Guam is only 3 hour's flying time from Asia and a U.S. territory, which eliminates the need for negotiating base arrangements with a foreign government, he continued.

Guam will not be replacing Subic's role as the Navy's primary ship repair facility in the Far East. It is hoped that this function can be covered by shifting fleet requirements to Japan, Singapore and Hawaii.

Already benefiting from a major boost from tens of thousands of Japanese tourists, the island's economy is bracing to receive up to 3,000 servicemen and their dependents between May and the end of December.

CG Proposes New Rules For Unmanned Tanker Enginerooms

In 1977, public outcry forced the Coast Guard to withdraw its opposition to the use of unmanned enginerooms while in U.S. waters. But, in light of the Oil Pollution Act of 1990, the agency is once again proposing new requirements for unmanned tanker enginerooms.

Tankers will not be allowed to operate unattended enginerooms in U.S. navigable waters unless the following regulations are adhered to:

*The tanker's flag of register must have an official document onboard that states in English: "Approved for periodically unattended machinery space operation."

*Before leaving the engineroom unattended, one of the ship's licensed engineers must conduct an inspection of the engineroom spaces to ensure that all equipment and alarms are operating properly. This inspection must be logged in the official logbook and be carried out before getting underway in U.S. waters or six hours before entering U.S. territorial waters (except for the Great Lakes).

*A designated licensed engineer must be on call at all times to answer engineroom alarms and at the direction of the deck officer on watch.

*Twelve hours before entering U.S. waters, no faults or alarm conditions have been registered in any vital ship's systems that require the attention of a licensed engineer.

The CG said that these conditions can be easily complied with at a minimal expense to tanker operators.

Astilleros & Lisnave Yards Sign Agreement

The Astilleros Espanoles shipyard, of Spain, and Portugal's Lisnave yard have signed a cooperation agreement which has created the new entity called Hispanic-Portuguese Shipyard Groupings (AEIE). The agreement was signed by Astilleros president **Juan Saez** and Lisnave's president **Jose Manuel De Mello.**

Effectively merging the repair work of the Lisbon yard with the Astilleros yard at Cadiz, the agreement takes place under European Community rules that permit firms to associate in a mid-way stage towards possible merger.

Deep-Sea Towage, Salvage And Heavy-Lift Markets

The role of towage, salvage and heavy-lift within the shipping industry is not large, but its importance far outweighs its size and it embraces an impressive and diverse range of expertise. The individual markets have undergone major upheavals over the past ten years and are set for further change during the 1990s. All companies within the market sector have had to face up to painful rationalization in changing market conditions. In a climate of rising operational costs and increasing economic discrimination each player is having to find new methods to secure a market position. Towage, for example, has lost part of its deep-sea market to heavy-lift vessels in some operational areas only to make gains elsewhere. New methods of handling heavy-lifts are proving more profitable, despite harsh trading conditions. Salvage, for its part, declared by some operators to be in crisis, continues to reward those bold enough to take an innovative approach.

Within a new report the technical aspects of tugs and heavy-lift vessels are concisely described and fleets analyzed by flag, age, and capability. The various market sectors of salvage, ship delivery, offshore cargoes and industrial cargoes are described, with the relationship between market sectors and vessels examined. An important section of the report details the trading positions occupied by more than 20 major companies.

The most political aspect of the industry relates to salvage, which has been subject to rising operational costs, fierce and growing competition, and static revenues.

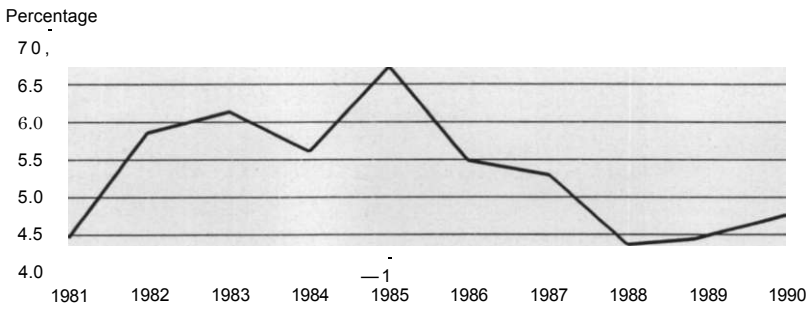
Salvage is becoming more difficult, both technically and legally, and the whole topic of salvage is the subject of enquiries within the industry, both by representatives of the industry and by official organizations. Public demand is for less maritime pollution (which appears to be more readily identified than landside pollution). Maritime pollution is now within the political arena and as a consequence a number of unilateral and international laws are encroaching on the industry without taking into account how the demands on the salvage companies are to be funded. Can local and offshore facilities be effectively organized and used for salvage purposes? These and other problems of the industry are addressed with the report. The whole salvage industry seems to be bedevilled with such questions while it is often forgotten that good and effective work is done every day in saving ships and cargo by both large and small organizations. The outlook for the individual market sectors within the industry are examined. Obviously, for the deep-sea towage sector the inevitable upturn in scrapping will provide more work, but ship owners will strive to minimize the length of towage passages and in some instances may have to use semi-submersible vessels (SSHLVs) where there is danger of pollution. But despite better prospects for employment, there will continue to exist an oversupply of tugs, which is bad news for newbuilding, but tugs will be upgraded and modified for new roles.

Operators of heavy-lift vessels (HLVs) who are able to fit ships into liner or quasi-liner services will stand to prosper, and will build ships suitable for the services in question.

Salvage operators are awaiting the outcome of the enquiry into the whole state of the market instituted by the International Salvage Union (ISU). They are also looking towards decisions that might be forthcoming from IMO, the U.S.A. and EC. While jealous of their independence, larger salvage operators are looking towards some form of financial help to assist with the high costs they face. Without such help it seems likely that there will be a continuation of the fall in investment that large salvage operators are prepared to make except where they see a good chance of a profitable return. It also seems inevitable that there will be an increase in official intervention and even of bureaucratic control in the light of the close connection of salvage with marine pollution control.

Reward As Percentage Of Salved Value*

ISU "No Cure No Pay" Contracts



•Ignoring Gulf wars
Source: ISU.

To order *"Deep-Sea Tbwage, Salvage, And Heavy-Lift Markets"* please contact: Drewry **Shipping Consultants Ltd.,** 11 Heron Quay, London E14 4JF, England.

-EDITORIAL

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With the completion of operations in the Persian Gulf, the ships of the Ready Reserve Fleet (RRF), which had supported the lift of material to the operations area, are returning and will need to be deactivated. This deactivation is critically important since the proper lay-up of these ships will make it easier to mobilize them in the event that we need them in the future.

Normally, the Maritime Administration (MarAd) would compete that work among private shipyards and award the contracts to the most competitive bidder among the interested yards. The result of such bidding activity is that the shipyards get an opportunity to participate in a project that generates much needed workload, while the U.S. Government obtains repair services that are essential for national defense at a cost savings for the taxpayer.

But language in last year's Dire Supplemental Bill, used to finance the Persian Gulf operation, clearly indicates that some old, bad habits die hard. In the Supplemental, there was report language that directed the Navy/ MarAd to *allocate* 50 percent of all deactivations to public sector shipyards. Notice that the tried and true word "competition" is nowhere to be seen. Since the Administration claims to believe that competition is vital in the development of markets, it is amazing that this *report language* is not only being adhered to, it is being slavishly followed, although there is no statutory requirement mandating such a division of work.

The Maritime Administration is planning to perform 81 deactivations. Initially, the industry had been informed that perhaps 3 or 4 availabilities would be assigned to the Charleston Navy Yard. Now, however, because of political pressure, as many as 21 deactivations may go to the Navy yards, with 13 planned for Charleston, 6 for Philadelphia (a facility that is on the 1991 Base Closure List), and 2 for a West Coast Navy yard. The reader should be aware that we are talking about *allocations,* not contracts awarded as a result of competition.

In point of fact, the real scandal has to do with the fact that the Navy yards are not even expected to meet what the Maritime Administration believes will be the cost to perform the deactivation in the most competitive shipyard. The procedure follows a path that suggests the days of smoke-filled rooms and back-door deals are not over: MarAd prepares a list of expected deactivations and the scheduled dates for those availabilities. The list is provided to the Naval Sea Systems Command (NAVSEA, Code 072). The Command identifies those ships that it wants. Then MarAd provides NAVSEA with the specification of work to be performed. If the Navy cost estimate is within 30 percent of the estimated cost to complete the job, the contract is awarded to the Navy yard. There is no competition, no pre-award survey to see if the yard is capable of performing the work, no post-performance audit to see if the Navy yard has properly charged its costs.

The amazed reader might ask, "How did the Maritime Administration determine that a 30 percent differential is acceptable?" The analysis that was performed was limited to one direct competition between public and private sectors for the first deactivation availability for the SS Cape Canaveral. In that competition, which was conducted in September 1991, the low bidder was determined to be Stevens Tech of Norfolk, Va. The winning bid was $946,000. The bid from the Charleston Navy Yard was $1,223,000. This result has essentially "baselined" the remaining deactivations.

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The bottom line is that the nation's private ship repair sector has to compete against not only subsidized foreign yards in Japan, Germany, and the European Community, but also against subsidized yards from the public sector. Only in ship repair do we see a Republican Administration abandon its free market principles to reward a defense arsenal structure that is more reminiscent of the 1890s, rather than that of the 1990s. If socialism has been rejected in the Commonwealth of Independent States, why does it hang on in the Naval Sea Systems Command?

Let competition decide where these jobs are to go.

Shipbuilders Council of America
4301 N. Fairfax Drive, Suite 330
Arlington, VA 22203
Tel.: (703) 276-1700

The freighter Coastal Voyager receiving paint and steel work in Marine Industries Northwest's MINI I drydock.

Coastal Transport Drydocks Freighters At MINI

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Major Conference On Oil

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Corps Of Engineers Asked To Fund More Renovations On Inland Waterways

The U.S. Army Corps of Engineers is facing a major effort from the inland waterway industry to have more funding from its operating budget diverted to low-cost lock renovations that would significantly reduce barge traffic delays.

Within two years of being approved, Corps money would begin flowing into new construction projects that would relieve serious backups along the Upper Mississippi and Illinois rivers.

The definition of what constitutes major rehabilitation will decide the fate of the waterway industry's plan, said federal and commercial officials. Under present requirements, the waterways trust fund, financed through fuel taxes on towboats, must supply half the money for major rehabilitation work. However, new rules proposed last year by the President's budget office direct the Corps to put even smaller projects within the bounds of fund financing.

Donald Sweeney, the Corps' chief economist in its St. Louis office, stated that the trust fund is already under so much financial strain that no new projects for the improvement of barge capacity can be considered until 2010.

The plan from the waterways trust fund users board would change the definition for projects requiring trust fund financing to only those construction projects that last over two years and result in extending lock life by 25 years. All other smaller scope work would fall under the sole funding responsibility of the Corps of Engineers.

While the Corps may eventually agree to reclassify its funding guidelines to match those of the waterway industry, it would continue to oppose any work that would increase river traffic capacity before it is able to complete renovations to selected locks and dams.

The Corps would also be forced to ask Congress for increased operational budget funding in order to cover the additional costs of the new work, which could run into many millions of dollars.

CD Based Government Logistics Data Available From USA Info Systems

USA Information Systems Inc., of Virginia Beach, is offering its compact disk (CD) based "CD-FICHE™" information storage and retrieval system to customers involved with government logistics support activities.

According to the company, CD-FICHE™ is a unique indexing and retrieval database software that gives the user access to 12 million computerized logistics files within the Federal Supply Cataloging System.

USA Information Systems claims that CD-FICHE is 8 times faster than microfiche storage media and is designed to be an easy to use high speed data research tool. System users can access data through a wide variety of search parameters, such as government supply codes or stock numbers, part names, contractor names or addresses, part numbers or even fragments of part numbers.

The system operates on any IBM/Zenith PC-XT/AT or true compatible with a hard disk and 640K of computer random access memory (RAM). When linked with a printer, the user can obtain data printouts.

Some of the data features of CD-FICHE include: all Federal Supply Catalog Files; the Past Procurement History/Price Analysis Report Files; the names, addresses and telephone numbers for over 400,000 commercial and government activities; and technical data on all parts and equipment displayed.

According to USA Information Systems, CD-FICHE$_{TM}$ is supported by a toll-free customer hotline and a trained support group to assist system users with questions or problems.

For free information detailing USA Information System's CD-FICHE$_{TM}$ logistical database,

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Major Conference On Oil Spill Laws & Response In Seattle, October '92

A conference on oil spill regulations and response and a related trade show will be featured during The Oil Spill Prevention And Response Expo (OSPRE), in Seattle, Washington, from September 30 - October 2,1992. Designed for vessel and facility operators facing new state, federal and provincial oil spill legislation, the conference will also bring together government officials and spill response firms who are involved in oil spill laws and services. Both the U.S. and Canadian Coast Guards will be supporting the event.

The Washington State Convention and Trade Center in Seattle will be the location of the conference and trade show. The preliminary agenda for the conference will include materials on federal regulations, West Coast state and provincial regulations, cleanup and damage assessment, and liability and insurance.

For program information contact **Steve Miller** at (206) 682-3607. For exhibit information contact **Scott White** at (206) 292-9198 or (800) 683-0547.

Open Committee On CG Oil Spill Legislation Completes 1 st Phase

The initial phase of the Coast Guard's first attempt at developing legislation with the assistance of direct public input is completed.

In an attempt to formulate a fair and reasonable set of regulations pertaining to the Oil Spill Act of 1990, the Coast Guard formed a 28 member committee to provide recommendations to be incorporated into a Notice of Proposed Rulemaking (NPRM). When published in early May, the NPRM will touch on such topics as tank vessel pollution response plans, the carriage of response equipment aboard tank vessels and the certification of oil cleanup contractors. The committee will reconvene after the close of the NPRM comment period to assist the Coast Guard in drafting the final rule.

The negotiated rulemaking committee consisted of representatives from environmental and public interest groups, spill response contractors, tank vessel owners and operators, cargo interests, oil handling facilities and state and local governments.

Pleased with the results of the negotiated process, Rear Adm. **Arthur E. Henn,** chief of the Coast Guard's office of marine safety, security and environmental protection, said "your efforts produced a far better regulation than if we had tried the traditional notice and comment method of rulemaking."

The Coast Guard would like to see negotiated rulemaking used in future cases where users are able to provide a valuable insight to the process.

Westinghouse To Supply Secondary Propulsion System for Seawolf Sub

Westinghouse Electric Corporation recently announced that it has been selected by the General Dynamics Electric Boat Division to design and build the secondary propulsion system for the U.S. Navy Seawolf submarine. General Dynamic's Electric Boat Division is the prime contractor for the Seawolf submarine.

The value of the contracts is about $6 million. Delivery is scheduled for later this year.

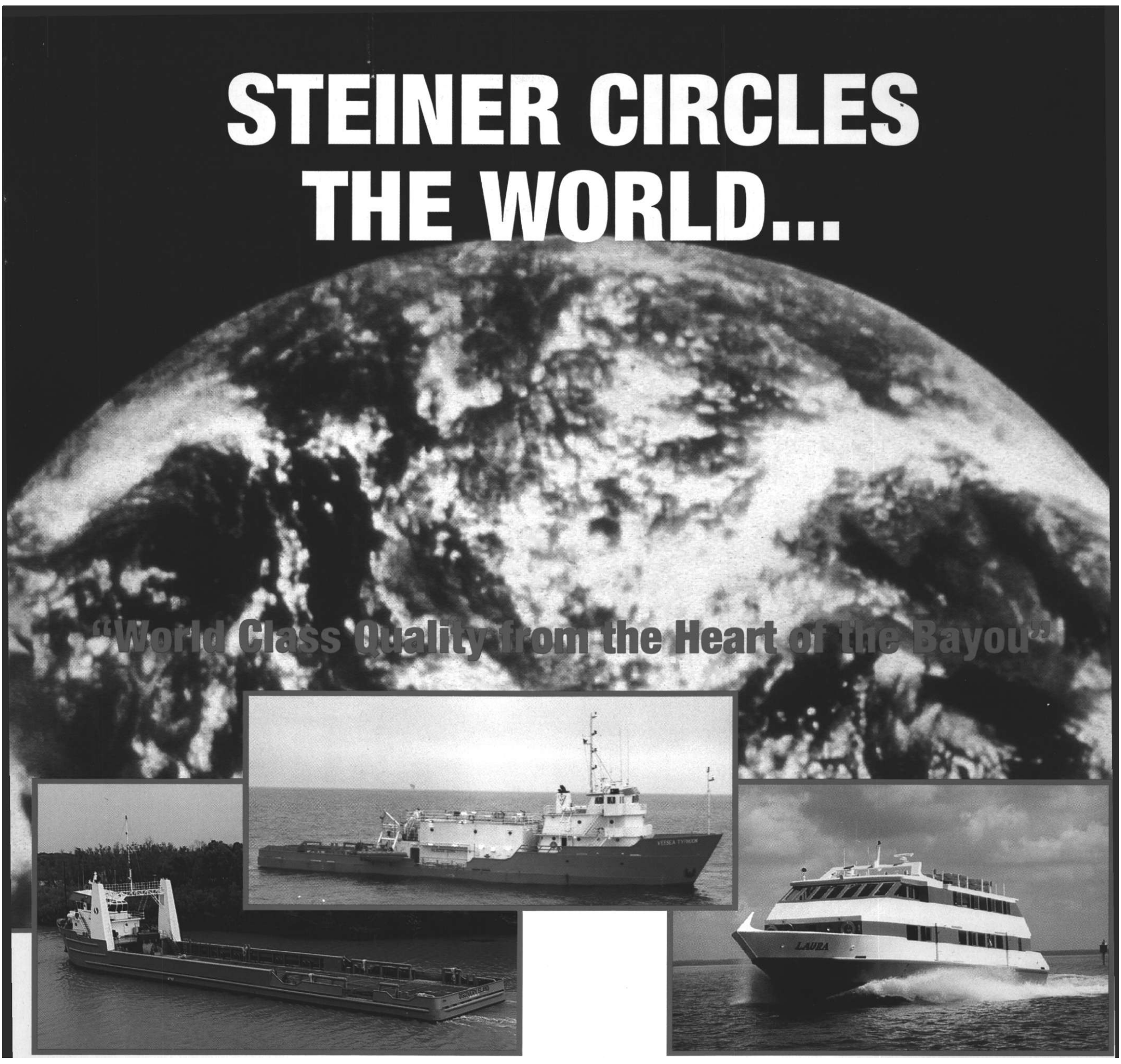
Westinghouse's secondary propulsion system uses a totally reconfigured submersible motor, combined with an innovative light-weight deployment and steering system, based on technology orininated at its Science and Technology Center. The system can be adapted for use with the Navy's other submarine classes and surface ships.

The company's Electro-Mechanical Division at Cheswick, Pa., will supply the system. The division has supplied nuclear power equipment to the Navy since 1952

For free literature giving more information on Westinghouse,

Circle 30 on Reader Serice Card

STEINER CIRCLES THE WORLD...



Steiner Shipyard circles the globe in search of customers such as Vector Offshore Ltd. of Great Britain and Seacor Marine, Inc. of Morgan City, Louisiana.

Whether they are built for construction support, standby rescue, or straight supply and towing supply operations, "Steiner-built" vessels, constructed of aluminum or steel, are built "Steiner-tough" to withstand all types of demanding marine environments.

From Boston Harbor to the waters of the U.S. Gulf, from off the African coastline to the harsh environment of the North Sea, STEINER SHIPYARD vessels define... WORLD CLASS QUALITY.

^ S k T E I N f i R
SHIPYARD, INC.

P.O. BOX 742, BAYOU LA BATRE, ALABAMA 36509
(205) 824-4143 • (205) 824-4884 FAX

RUSSELL R. STEINER, PRESIDENT

Circle 265 on Reader Service Card

RORO 92

The 11 th International Conference & Exhibition For The Roll-on/Roll-off Marine Transportation Industry, SVENSKA MASSAN GOTHENBURG, SWEDEN 20-22 May 1992

From May 20 to 22, the Svenska Massan Conference Center and Sara Gothia Hotel in Gothenburg, Sweden, will be hosting RoRo 92, the 11th biennial international conference and exhibition on Roll-on/Roll-off transportation concepts. Begun in 1976, the international conference was last held in Gothenburg in 1988 and in Trieste, Italy in 1990.

The main focus of RoRo 92 will be on future developments in ship requirements, ship types and designs, port systems, environmental concerns, new European RoRo waterways, advances in terminal and linkspan designs, new Safety Of Life At Sea (SOLAS) regulations, and the latest in swapbody and cassette handling.

For over 15 years the exhibition has been firmly established as the leading international event for those involved in the Roll-on/Roll-off industry and an excellent business environment in which to promote their capabilities. The conference will bring together the views and exhibits of some of the leading executives from the various sectors of RoRo handling, shipping lines, ports, marine machinery and cargo equipment manufacturers. Some of the products and services that will be on display include: RoRo tractors and forklifts; skid safety items; cargo lashing gear; marine navigation equipment; RoRo ship and ferry designs; port layouts; marine machinery; container handling equipment and cranes; and ship management services. Participants from 40 countries are expected to attend RoRo 92.

RoRo 92 - The international marine industry's leading conference and exhibition exclusively focused on Roll-on/Roll-off transportation.

The three-day program comprises 10 sessions under the following headings:

Session 1 - MARKETS & NEEDS
Session 2 - FAST RORO, THE FUTURE
Session 3 - PORT FUTURES
Session 4 - FOREST PRODUCTS
Session 5 - SHIP DESIGN/ PROPULSION
Session 6 - COASTAL & INLAND RORO
Session 7 - LASHING & STEVEDORING
Session 8 - TERMINAL DEVELOPMENTS
Session 9 - SHIP SURVIVABILITY
Session 10 -HANDLING & TRANSPORT

The two opening sessions both address several key issues for the future of the business. The feasibility of several fast sea transport projects between Scandinavia and the European continent will be examined in the Fast RoRo Session, as well as the results of a major study carried out by Finland's Kvaerner Masa-Yards.

Pollution concerns and their possible solutions will be discussed during the Coastal, Inland RoRo and Ship Design & Propulsion sessions.

One of the keynote speakers of the conference will be the U.S. Navy's commander of Military Sealift Command, Vice Adm. **F. R. Donovan.** Based on the experience gained by coalition forces during the Gulf War, Admiral **Donovan** will discuss the critical contribution made by RoRo merchant vessels to the allied supply effort and the importance of maintaining a sufficient number of modern RoRo vessels.

A major highlight of RoRo 92 will be the gala dinner and reception hosted by Stena Rederi AB and the Swedish Shipowners Association on board the STENA DANICA. The luxury ferry will cruise through the beautiful Gothenburg Archipelago to Frederikshavn, Denmark, and back.

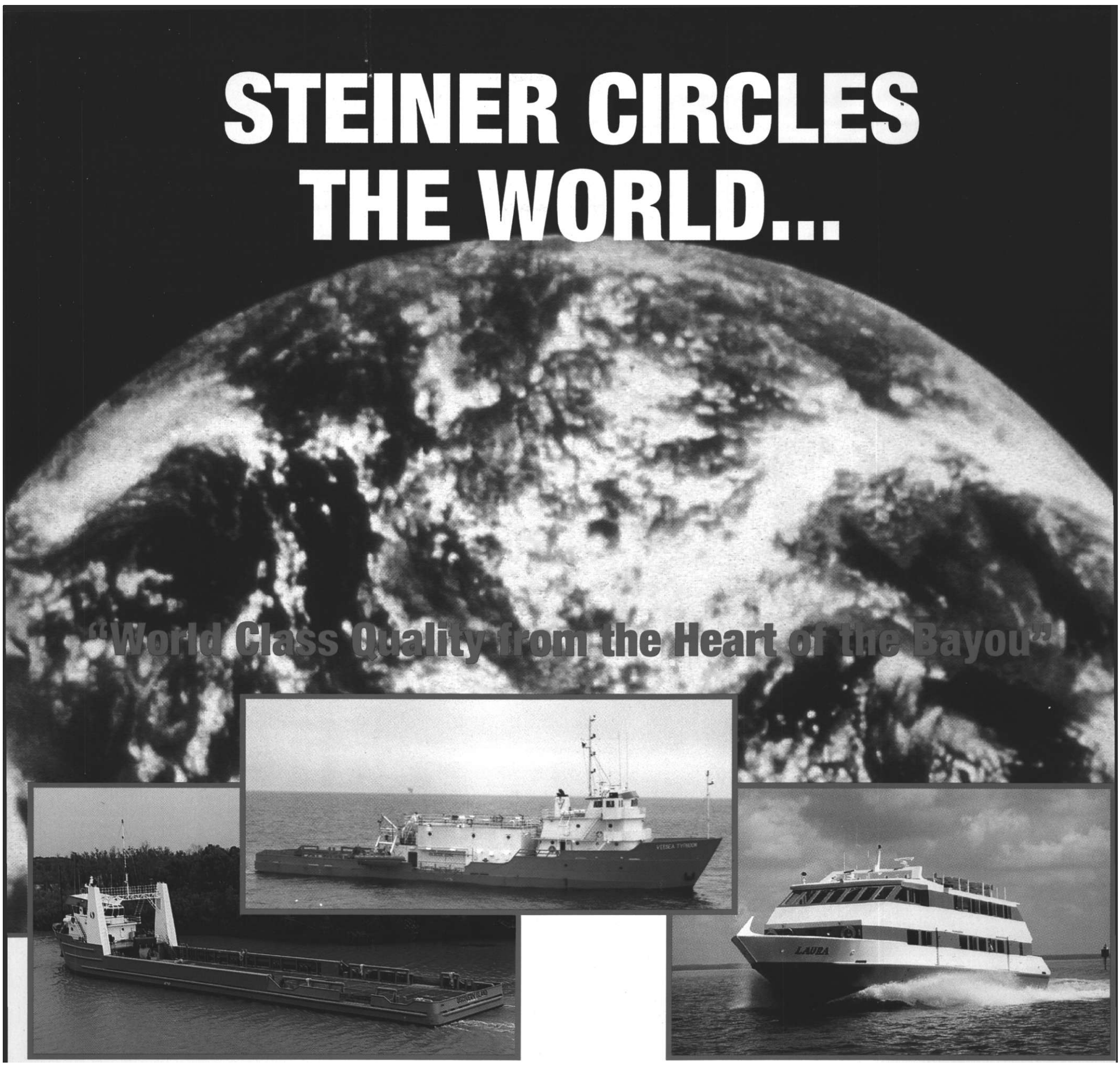
For additional information on registration and attendance, contact: RoRo Secretariat, 2 Station Road, Rickmansworth, Herts WD3 1QP U.K.; telephone: (from U.S. - 011) 44-923-776363; fax: (011) 44-923-777206.

List Of Exhibitors For RORO 92

Ancra Marine
Associated British Ports
Association of Italian Ports
Bollnas Terminal Equipment
Brax Shipping
British Marine Equipment Association
Butterley Engineering
Cargo Safe SOE
Cargo Transit Services
Cedervall & Soner
Consent Equipment
Conver OSR
Convoys (London Wharves)
Cory Brothers Shipping
CVS
Deltamarin
EML Produkter
Fagioli
Finncarriers
Finnish Foreign Trade Association
Finnish Marine Technology
Finnyards
Fosroc International
Furuno Sverige
Goteborgs Hamn
Helsingborgs Hamn
Hyco Boss
IMA
Imperial Wharf & Shipping
Intering
International Maritime Organization
Kalmar LMV
Kent Line
Kettenwerk Brueckle
Kvaerner Masa-Yards
Kvaerner Ships Equipment
Lars Wenneras Marine
Liftec Products Oy
Lubecker Hafen
M L Douglas Equipment
MacGregor-Navire (GBR)
Mafi Transport Systeme
N & T Estline
Nautic Center
Norfreight
Plan Marine
Port Development International
Port of Aalborg
Port of Bilbao
Port of Blyth
Port of Hamburg
Port of Hanko
Port of London
Port of Monfalcone
Port of Rotterdam
Port of Tilbury
Port of Zeebrugge
Ports of Lower Saxony
Purfleet Thames Terminals
Reliance Mercury Vehicles
Rolux
Scott
Seacon Holdings
Sealink Harbours
Seasafe Transport
Seehafen Rostock
Simsonship
Stena Rederi
Svensk Sjofarts Tidning
Swedish Telecom Radio
SweFerry
Tor Line
Transport NYTT
Transtema Communications
Volvo Penta
Walham Terminal
Wallenius Lines
Wartsila Diesel

(Partial listing)

STEINER CIRCLES THE WORLD...



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Circle 265 on Reader Service Card

RORO 92

The 11th International Conference & Exhibition For The Roll-on/Roll-off Marine Transportation Industry, SVENSKA MASSAN GOTHENBURG, SWEDEN 20-22 May 1992

From May 20 to 22, the Svenska Massan Conference Center and Sara Gothia Hotel in Gothenburg, Sweden, will be hosting RoRo 92, the 11th biennial international conference and exhibition on Roll-on/Roll-off transportation concepts. Begun in 1976, the international conference was last held in Gothenburg in 1988 and in Trieste, Italy in 1990.

The main focus of RoRo 92 will be on future developments in ship requirements, ship types and designs, port systems, environmental concerns, new European RoRo waterways, advances in terminal and linkspan designs, new Safety Of Life At Sea (SOLAS) regulations, and the latest in swapbody and cassette handling.

For over 15 years the exhibition has been firmly established as the leading international event for those involved in the Roll-on/Roll-off industry and an excellent business environment in which to promote their capabilities. The conference will bring together the views and exhibits of some of the leading executives from the various sectors of RoRo handling, shipping lines, ports, marine machinery and cargo equipment manufacturers. Some of the products and services that will be on display include: RoRo tractors and forklifts; skid safety items; cargo lashing gear; marine navigation equipment; RoRo ship and ferry designs; port layouts; marine machinery; container handling equipment and cranes; and ship management services. Participants from 40 countries are expected to attend RoRo 92.

RoRo 92 - The international marine industry's leading conference and exhibition exclusively focused on Roll-on/Roll-off transportation.

The three-day program comprises 10 sessions under the following headings:

Session 1 - MARKETS & NEEDS
Session 2 - FAST RORO, THE FUTURE
Session 3 - PORT FUTURES
Session 4 - FOREST PRODUCTS
Session 5 - SHIP DESIGN/ PROPULSION
Session 6 - COASTAL & INLAND RORO
Session 7 - LASHING & STEVEDORING
Session 8 - TERMINAL DEVELOPMENTS
Session 9 - SHIP SURVIVABILITY
Session 10 - HANDLING & TRANSPORT

The two opening sessions both address several key issues for the future of the business. The feasibil ity of several fast sea transport projects between Scandinavia and the European continent will be ex amined in the Fast RoRo Session, as well as the results of a major study carried out by Finland's Kvaerner Masa-Yards.

Pollution concerns and their possible solutions will be discussed during the Coastal, Inland RoRo and Ship Design & Propulsion sessions.

One of the keynote speakers af the conference will be the U.S. Navy's commander of Military Sealift Command, Vice Adm. **F. R. Donovan.** Based on the experience gained by coalition forces during the Gt lf War, Admiral **Donovan** will di cuss the critical contribution made by RoRo merchant vessels to the allied supply effort and the impor tance of maintaining a sufficieht number of modern RoRo vessels.

A major highlight of RoRo 92 will be the gala dinner and reception hosted by Stena Rederi AB and t Swedish Shipowners Association on board the STENA DANICA. The luxury ferry will cruise through t' beautiful Gothenburg Archipelago Frederikshavn, Denmark, and bac

For additional information on registration and attendance, contact: RoRo Secretariat, 2 Station Road, Rickmansworth, Herts WD3 1QP U.K.; telephone: (from U.S. - 011) 44-923-776363; fax: (011) 44-923-777206.

List Of Exhibitors For RORO 92

Ancra Marine
Associated British Ports
Association of Italian Ports
Bollnas Terminal Equipment
Brax Shipping
British Marine Equipment Association
Butterley Engineering
Cargo Safe SOE
Cargo Transit Services
Cedervall & Soner
Consent Equipment
Conver OSR
Convoys (London Wharves)
Cory Brothers Shipping
CVS
Deltamarin
EML Produkter
Fagioli
Finncarriers
Finnish Foreign Trade Association
Finnish Marine Technology
Finnyards
Fosroc International
Furuno Sverige
Goteborgs Hamn
Helsingborgs Hamn
Hyco Boss
IMA
Imperial Wharf & Shipping
Intering
International Maritime Organization
Kalmar LMV
Kent Line
Kettenwerk Brueckle
Kvaerner Masa-Yards
Kvaerner Ships Equipment
Lars Wenneras Marine
Liftec Products Oy
Lubecker Hafen
M L Douglas Equipment
MacGregor-Navire (GBR)
Mafi Transport Systeme
N & T Estline
Nautic Center
Norfreight
Plan Marine
Port Development International
Port of Aalborg
Port of Bilbao
Port of Blyth
Port of Hamburg
Port of Hanko
Port of London
Port of Monfalcone
Port of Rotterdam
Port of Tilbury
Port of Zeebrugge
Ports of Lower Saxony
Purfleet Thames Terminals
Reliance Mercury Vehicles
Rolux
Scott
Seacon Holdings
Sealink Harbours
Seasafe Transport
Seehafen Rostock
Simsonship
Stena Rederi
Svensk Sjofarts Tidning
Swedish Telecom Radio
SweFerry
Tor Line
Transport NYTT
Transtema Communications
Volvo Penta
Walham Terminal
Wallenius Lines
Wartsila Diesel

(Partial listing)

RORO 92 - GOTHENBURG PROGRAM OF EVENTS

Day 1: Wednesday, 20 May

9 a.m. - RoRo 92 Registration & Exhibition Opens

2 p.m. - RoRo 92 Conference Opens

Session 1: MARKETS AND NEEDS

The RoRo Market And Its Continuing Importance To Merchant And Military Needs **- M. Sclar,** senior consultant, DRI/McGraw-Hill, Lexington, U.S.A

Vehicle Shipments In A Turbulent World **- N. Kurten,** executive vice president traffic & marketing, Wallenius Lines AB, Stockholm

Italy's Coastal Sea-Roads. Starts Moving In June With The First Of Five New RoRo's **- G. Migliorino,** vice president strategic planning, Finmare, president, Viamare, Genoa

RoRo Tonnage. The Ship Of Choice For "Desert Storm" - Vice Adm. **Donovan,** Military Sealift Command, Washington, D.C.

Session 2: FAST RORO - The Future?

Really Fast Freight RoRo Ships Could Change The Market. Are The Economics Feasible? **- K. Levander,** senior vice president ship design, Kvaerner Masa-Yards, Turku, Finland

The ACOUASTRADA High Speed Design Of Car Carrying RoRo **- A. Sculati,** head of project, Rodriquez Cantieri, Navali SpA, Messina, Italy

Large Catamaran Designs Could Provide The Optimum Solution **- P. Wintzer,** vice president, Sweden Ship Invest, Sweden

End of First Day's Conference Welcome Reception from the City of Gothenburg

Day 2: Thursday, 21 May

Session 3: PORT FUTURES
(parallel with Session 5)

Scandinavian. Continental Trade Traffic Development With Special Reference To The Transit Function Of The Port Of Hamburg **- H. L. Beth,** Hamburger Hafen - und Lagerhaus AG, Hamburg

RoRo. A Flexible Friend **- J. McNab,** chief executive, Port of Tilbury, U.K.

Session 4: FOREST PRODUCTS
(parallel with Session 5)

Using A New Flat/Cassette System For Door-To-Door Forest Products Logistics **- J. Ebeling,** vice president transport systems, Jaakko Poyry Consulting Oy, Vantaa, Finland

Cassettes Bv Rail. Opening Up A New Discussion - (speaker to be announced)

Protecting And Lashing Of Paoar Rolls And Other Cargoes. A New System **- J. Finell,** technical development, Wisapak, Jakobstad, Finland

A Forest Product Terminal Operator's View: Today's Requirements. Misconception Versus Reality? **-S.T.Cass,** managing director, Crescent Wharves Ltd., and **N. Hempstock,** assisting managing director, Hayes Marine Services Ltd., Chatham, U.K.

Session 5: SHIP DESIGN AND PROPULSION
(parallel with Sessions 3/4)

Design Of A Low Emission Propulsion Plant For A Ferry**-P. Furu,** manager, technical sales support, Wartsila Diesel, Oy, Finland

MS "Aurora" (The World's Most Environment-Friendly RoRo Ferry) With SCR Emission Control Operating With Urea **- C. Schoug,** fleet manager, SweFerry, Helsingborg, Sweden

Trailer Vessels For The 21 st Century. The Efficient Use Of Computerized Design **- P. Rosholm,** managing director, Kvaerner Ships Equipment AB, Gothenburg

High Performance Freight Ferries For The English Channel **- J. Gollenbeck,** member of the board, Schichau Seebeckwerft AG

The Practical Application Of Utility Analysis To RoRo Ship Design: Pavload Handling Potions Related To Costs **- D. Byrne,** managing director, Transmarine Ltd., U.K.

RoRo Designs For U.S. Strategic Sealift (NAVSEA) **W. Stuart,** president, Stuart Marine International Inc., Houston, and B. McCormick, Alabama Shipyard Inc., Mobile

Session 6: COASTAL AND INLAND RORO
(parallel with Session 7/8)

Danube RoRo: Cost-Effective And Environmentally Friendly Alternative To Overland Transport **- B. Christov,** U.K. manager, SOMAT International Road Transport, Sofia, Bulgaria

Car Logistics Bv Inland Waterway. The Environmental Solution **- W. M. van Wijngaarden,** managing director, Nedlloyd Rijn-EnBinnenvaart, Rotterdam

New RoRo Possibilities On The Trans-Eurooean Waterway **- N. Gosztonyi,** transport consultant, (including adviser to Hungarian Government), Switzerland

New Possibilities For RoRo Traffic In European Coastal Shipping **- P. Struijs,** executive director shipping, Port of Rotterdam, Netherlands

A New Short-Sea Shipping Concept To Reduce Costs **- A. Sjobris,** MariTerm AB, Gothenburg

Session 7: LASHING AND STEVEDORING
(parallel with Session 6)

Cargo Care. ATraining Proeram For Safe Stowage And Securing Of Cargo And Its Influence On RoRo Safety**-P. Andersson,** MariTerm AB, Gothenburg

Session 8: TERMINAL DEVELOPMENTS
(parallel with Session 6)

Computerized Traffic Management At Large Ferry Terminals**-L. Roueche,** manager of planning and research, British Columbia Ferry Corporation, Canada

Planning & Development Of New RoRo Facilities For Sealink Stena Line **- D. Wignall,** port civil engineer, Sealink Stena Line, Harwich, and K. C. Fear, Posford Duvivier, Peterborough, U.K.

Seven New RoRo Terminal Projects On Irish Sea Routes (Both Conventional And High Speed) Encouraged Bv EEC Funding For Cross-Channel Transportation**-M. B. Lohn,** director, L.G. Mouchel & Partners Ltd., Weybridge, U.K.

Double-Deck Linkspans To Suit All RoRos. Including Brittany Ferries. SuperFerries And The New High Speed Catamarans **- J. Rose,** managing director, Marine Development Ltd., Scotland

End of Second Day's Conference - Official RoRo 92 Reception and Dinner hosted by Stena Rederi AB and the Swedish Shipowners Association aboard the STENA DANICA super ferry sailing between Sweden and Denmark.

Day 3: Friday, 22 May

Session 9: SHIP SURVIVABILITY
(parallel with Session 10)

Conversion Of Existing Passenger Ferries To Meet The New SOLAS Stability Regulations **- C. Lloyd,** deputy managing director, BMT Cortec Ltd., Wallsend, U.K.

The New Subdivision Regulations: Application And Effect On Current RoRo Design **- S. Rusas,** principle surveyor, Det norske Veritas Classification A/S, Oslo

A Report On The SOLAS 90 Amendments (From The April 1992 Session Of The IMP Maritime Safety Committee) **- R. Sundstrom,** head of ship construction and equipment division, Maritime Safety Department of the Swedish Administration of Shipping and Navigation, Norrkopping

Location And Extent Pf Flooding. A Dynamic Analysis **- D. Vassalos** and **0. Turan,** department of ship and marine technology, University of Strathclde, Scotland

Session 10: HANDLING & TRANSPGRT
(parallel with Session 9)

Future Reduction Of Diesel Exhaust Emissions For Material Handling Equipment **- P. von Braun,** senior product engineer, Volvo Penta, Gothenburg

Simple Solutions For Swaobodv Handling Of RoRo Vessels **- A. Ivarssen,** CCH AB, Sweden

Using Swaobodies For Multi-Modal JIT Logistics - **S. Wells,** general manager transport, TNT, Netherlands

New RoRo System For Steel Products - (paper to be confirmed), NKK Corporation, Japan

Using Cassettes In The Steel Industry **- R. Engstrand,** distribution manager, SSAB Oxelosund, Sweden

Recent Advances In RoRo Technology **- W. Lister,** Listavia International Consultants Ltd., U.K.

1 p.m. - Close of Conference

4 p.m. - Close of Exhibition

McQuay Chiller's QEII Experience Proves Reliability

Nearly 20 years ago three McQuay 500-ton centrifugal chillers were installed onboard the Queen Elizabeth II (QEII) to provide the vessel's main chilled water supply. Today, according to Cunard Line, all three chiller units are fully operational.

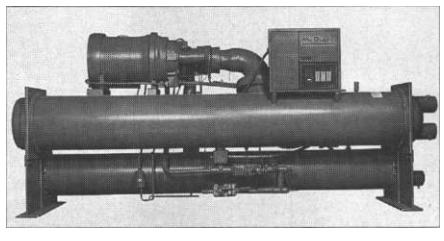
The example set by the QEII's McQuay centrifugal chillers has lead to the line's successful sale to other maritime companies, according to **A1 Ward,** director of customer support for SnyderGeneral Corporation, the manufacturer of the McQuay centrifugal chiller.

Six McQuay chiller units were recently ordered by the Italian cruise line Costa for six of its passenger vessels. Mr. **Ward** commented that, "The Costa purchase represents a growing awareness of the benefits of positive pressure centrifugal technology in marine environments."

Because McQuay chillers are engineered with positive pressure refrigerants, outside air, salt and other contaminants are prevented from entering the unit. According to Mr. **Ward,** this results in a significant reduction in corrosion and related maintenance,"... a major benefit for cruise ship installations."

This advantage in using the positive pressure chiller helped Costa to make its decision to select the McQuay design, Mr. **Ward** said. Costa has purchased the McQuay Model PEH single compressor water cooled centrifugal chiller, the flagship of the McQuay product line, for each of the six cruise ships.

Offering many advantages, the PEH medium pressure refrigerant system features five basic compressor frame sizes, ranging from 70 to 1,350 tons. Over 500,000 computer matched configurations are possible with such variations as impeller, gear ratio, condenser and evaporator tube surfaces.



The McQuay centrifugal chiller manufactured by SnyderGeneral Corporation.

A significant environmental safety feature of the PEH centrifugal chillers are their ability to utilize HFC-134a, a highly efficient refrigerant that is completely ozone safe.

SnyderGeneral is a privately owned Dallas-based manufacturer and marketer of a full line of air quality control products and services for commercial, industrial and institutional application. The company's line of equipment includes: heating, ventilation and air conditioning (HVAC) units; air filtration and pollution control products; clean room equipment and machinery intake filtration, and acoustical systems. The company also manages 35 manufacturing facilities in Europe, North and South America, Australia, Mexico and Singapore.

The company's Minneapolis-based Commercial Products Group markets McQuay HVAC equipment, BarryBlower and JennFan commercial and industrial fans, AAF HVAC products, Wesper fan coils and air handling units. SnyderGeneral also operates McQuayService, an integrated service and parts organization serving HVAC users worldwide.

For free illustrated brochures and literature completely describing McQuay centrifugal chillers and other equipment in the SnyderGeneral product line,

Circle 14 on Reader Service Card

Portland Box Volumes Up 25 Percent In February

A Tidewater Barge Line multiple tow, with containers-on-barge, featured on the March 1992 cover of MARITIME REPORTER.

The Port of Portland continued its healthy container increase in February with a 25.3 percent increase over the same month a year ago.

Portland's gateway handled 17,110 TEUs in February this year compared to 14,139 TEUs in February 1991.

Portland experienced an 8 percent increase in containers during 1991. Significant increases of double-stack railcars at the port's expanded on-dock intermodal rail yards at Terminal 6 were recorded during the year. Portland also benefited from increased container-on-barge movements on the Columbia/Snake River system.

A Tidewater Barge Line multiple tow, including a containers-on-barge, on the Columbia River above the Port of Portland, was featured on the March 1992 cover of MARITIME REPORTER.

Bob Liscomb, port marketing manager, said the lack of congestion, excellent rail services and "last port of call status" is drawing more export cargo from the Midwest.

February also was an all-time record for mineral bulks at the port's Terminal 4 Hall-Buck Marine bulk facility, where 276,457 short tons were handled. This facility handled a total of 2,103,129 short tons during 1991. Commodities are chiefly soda ash and bentonite clay exported to East Asian countries for making glass and use as foundry clay, respectively.

For free literature detailing the Port of Portland's container handling facilities and capabilities,

Circle 49 on Reader Service Card

New Study Examines Under-Priced Ship Resale Market

Certain sizes of ships, both bulk carriers and tankers, are usually under-priced by the ship resale market, according to a new study compiled by a New York maritime consulting firm.

Shipping Intelligence, Inc., publishers of The Ship Sale Monitor and The Period Time Charter Monitor, reported that two size ranges of bulk carriers and three size ranges of tankers generally sell at prices less than the market would seem to call for.

According to the report, Under-Priced Ships, this market under-pricing exists during strong markets and weak markets and for both older and newer ships. For prospective shipowners whose requirements can be satisfied by these ship categories, significant savings can be realized.

The report analyzed 1,934 actual ship sales that took place between January 1,1987 and March 15,1992. The principal analytical tool used in the compilation of this report was the Shipping Intelligence statistical ship sale pricing model.

For further information, contact: **Sydney P. Levine,** president, Shipping Intelligence, Inc., 25 West 43rd Street, New York, N.Y. 10036; telephone: (212) 997-0966.

Raytheon Announces New Handheld VHF Radiotelephone

Raytheon has announced its new JRC JHS-7 hand-held VHF radiotelephone which provides communication between survival craft and nearby vessels through the use of up to 13 channels.

The radiotelephone is designed for short range communications with a minimal battery power consumption. According to Raytheon, the unit was designed to operate in any weather conditions for up to eight hours; should be able to withstand a drop of one meter onto a hard surface; is waterproof and tested at a submersion depth of one meter for at least five minutes; and is built to survive a thermal shock of 113 degrees Fahrenheit.

The JHS-7 complies with GMDSS (Glohal Maritime Distress and Safety System) requirements and all IMO resolution A605 (15) standards for survival craft two-way VHF apparatus.

For more information detailing the JHS-7 from Raytheon,

Circle 29 on Reader Service Card

Siemens To Supply Full Electrical System For New Research Vessel

The contract to install a complete electrical system onboard the new ocean research ship being built for the Royal Norwegian Defense Research Institute has been awarded to the Siemens Marine Department, Bergen, Norway. The contract was awarded to Siemens, one of the world's leading vendors of electrical marine systems, by the Langstern Slip og Baatbyggeri A/S, shipyard of Tomrefjord, Norway.

Siemens was selected for the project because of the electromagnetic compatibility of its system. The contract includes supply and services for the propulsion and automation system; navigation and communication equipment; the ship's commissioning; and the delivery of a new version of the successful SIMATIC automation system.

The research vessel's propulsion concept is based on high voltage generators and DC motors with thyristor rectifiers in the mega watts range.

The company maintains a broad network of 100 technical offices in ports around the globe, with Siemens products and systems currently onboard 180 North American ships.

For more information detailing Siemens Marine's product line of marine electrical systems,

Circle 123 on Reader Serice Card

$9.7 Million Contract Awarded By MSC To Cuban Caribbean Shipping

Cuban Caribbean Shipping, Inc. of Jacksonville, Fla., was recently awarded a $9.7 million contract by the U.S. Navy's Military Sealift Command Central Technical Activity. The contract, which includes an option, is for intermodal ocean transportation between Naval Station Guantanamo Bay, Cuba, and Naval Supply Center in Norfolk, Va., and Jacksonville, Fla.

Cuban Caribbean Shipping, Inc. will supply two ocean going tugs, M/V Miss Mackenzie and MTV Dallas J. Adams, and a barge, MAI 201, to be used in this service. The contract terms are for one year with a onp year option.

Alfa-Laval Introduces New Automatic Viscosity Control System

Alfa-Laval has introduced a new automatic viscosity control system for fuel oils. The company claims that the reliability of the system as compared to conventional viscometers is primarily due to the simple vibrating rod principle employed in the viscosity transducer.

The new system is called Viscochief and is made up of a viscosity transducer, a viscosity control unit and a Heatpac heater. The transducer simultaneously measures temperature and viscosity and relays the information to the control unit. The control unit adjusts the oil viscosity via the heater.

Headquartered in Sweden, Alfa-Laval is an international supplier of oil treatment systems to the marine and power industries.

For further information detailing the Viscochief,

Circle 100 on Reader Service Card

Propulsion System Demonstrator Powered By GE Gas Turbine

A General Electric (GE) LM120 marine gas turbine has been installed aboard the propulsion system demonstrator (PSD) vehicle for the U.S. Marine Corps' Advanced Amphibious Assault program. The turbine reportedly was successful in powering the vehicle during waterborne testing.

Tests conducted by the Naval Surface Warfare Center, Carderock Division, reportedly proved that an amphibious vehicle can travel at over 20 miles per hour (mph) in the water and also be able to perform well on land. Reported speeds of 33 mph were recorded, compared to a water speed of 8 mph for the current operational amphibious vehicle, the AAV7-A1.

The entire propulsion system consists of a Cummins VTA903 diesel engine and the LM120 gas turbine. The diesel powers the vehicle on land. In high-speed operations in the water, the vehicle is propelled by four water jets, with the diesel powering one and the LM120 gas turbine driving the other three.

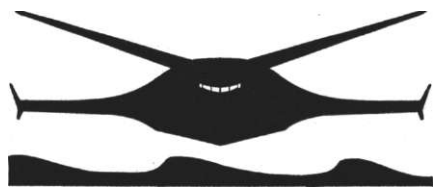
Further tests are expected to take place at the Marine Corps Amphibious Vehicle Test Branch, Camp Pendelton, Calif., and should take six months to complete.

The LM120 gas turbine is derived from the T700/CT7 family of turboshaft and turboprop engines and is rated horsepower at 1,650 to 2,000 shaft horsepower. More than 6,000 of the T700/CT7 engines have been installed on helicopters, regional airliners and military transports.

For more information about the LM120 gas turbine,

Circle 17 on Reader Service Card

Intersociety High Performance Marine Vehicles Conference and Exhibit 1992



24-27 June 1992
Ritz-Carlton Hotel, Pentagon City
Arlington, Virginia

An international conference is planned dedicated to the enhancement of ideas concerning Advanced Marine Vehicles and to fostering communications between users and technologists in the field. The program will provide a wide forum for the exchange of information. In addition to the formal technical sessions, video sessions, program progress reports, exhibits and displays, demonstrations and field trips are planned.

Technical Presentations

Formal papers on modern craft and ships concepts, system and component characteristics, operations, test and evaluation, and engineering and economic analyses and comparisons are planned. Vehicle types include planing hulls, hydrofoils, surface effect ships, amphibious air cushion vehicles, SWATH, catamarans, etc., including near surface high performance vehicles such as WIGS and seaplanes.

For additional information contact:

Capt. James Grabb, USCG (Ret.)
HPMV '92
American Society of Naval Engineers
1452 Duke Street
Alexandria, VA 22314-3458
703/836-6727

Sponsor: American Society of Naval Engineers (Flagship Section)
Cosponsor: More than 10 societies are anticipating cosponsorship

Circle 202 on Reader Service Card

International Tug & Salvage Expo 1992

Show Set for May 27-29, Genoa, Italy

The next (12th) International Tug & Salvage Exhibition will incorporate the Genoa Workboat Show, bringing two exhibitions under one roof at the international fairground in Genoa, Italy, May 27-29, 1992, during the gathering of executives involved in the tug, towage and salvage business. This combination greatly enlarges the scope of products and services on display, and also serves to provide the widest possible appeal to trade visitors.

The International Tug & Salvage Exhibition has been held biennially all over the world during the last 20 years. Well over 3,500 executives involved in the tug and salvage business have attended these events which have been held in London, Vancouver, New Orleans, Rotterdam, Hamburg, Singapore, Sydney and Halifax.

Thanks to the unique combination of "two fairs under the same roof," the Genoa Workboat Show will be a showcase for anyone involved with commercial craft and associated equipment or services with a vast range of products and services directly relevant to owners, operators or users of small and big commercial craft. Many boats will be available for demonstration to allow the visitors to view and test a prospective purchase. The show will present everything from winches to propellers, from radar to pumps.

Parallel to the Genoa Workboat Show/Tug & Salvage exhibition, there will be a series of new product seminars held by leading people of the industry who inform the visitors of new technologies and development of the sector.

The 12th International Tug & Salvage Convention, one of the world's largest gatherings of senior executives involved in the tug, towage and salvage industry, will take place in Italy for the first time, at the Grand Hotel Miramare, Santa Margherita-Portofino.

The convention papers, delivered by highly qualified speakers from all over the world, will cover specific marine salvage topics as well as traditional tug-related subjects.

Simultaneous English/Italian translation will be available, and preprints of the papers will be sent to registered delegates well in advance of the convention in order that they may have a chance to study them and prepare questions. Speakers will give a resume of their papers, and an equal amount of time will be given over to discussion.

The recognition of the Genoa Workboat Show as a show of prime importance is demonstrated by the active participation of the Port of Genoa and the National Passengers Transport Association, gathering the main Italian companies who operate in this sector.

As an integral part of the convention there will be a full social program to which delegates' partners are invited.

For further information, contact: Expoconsult s.r.l., Galleria del Corso, 2 - 05100 Terni, Italy, phone ++39 744 400.544, fax ++39 744 451.235.

Kaldnes Shipyard To Concentrate On Offshore Sector

Kaldnes Shipyard in Tonsberg, Norway, recently announced that it will be switching its specialty to the offshore sector in July. The yard presently specializes in the construction of tankers and general cargo carriers up to 30,000 tons.

The reason for the switch was given as lost revenue and poor market conditions.

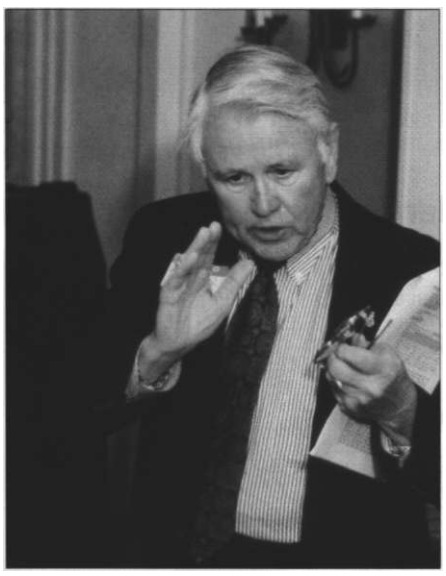
Plans for the yard call for it to be involved in the fabrication sector of the offshore industry. Kaldnes is involved in the offshore sector in a joint venture with Heerema.

Capabilities Of Trinity Mariners New Beaumont Yard Highlighted

The Trinity Marine Group (TMG), of Gulfport, Mississippi, recently conducted a week long sales and marketing drive through New York and New Jersey to promote the group's 11 shipyards, particularly its newly renovated yard in Beaumont, Texas.

Mr. **Walter W. Rody,** of TMG, gave luncheon presentations to senior managers from ship and barge operators in both states. During the meetings Mr. Rody showed a 12 minute video about the facilities of TMG before beginning his discussion on Trinity Beaumont.

TMG is wholly owned by Trinity Industries, of Dallas, a large manufacturer of heavy metals products for rail cars, marine products, structural products, and pressure/non-pressure containers. Trinity Industries has generated revenue in each of the last 3 years in excess of $1 billion, with TMG alone contributing over $230 million.



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Intersociety High Performance Marine Vehicles Conference and Exhibit 1992

24-27 June 1992
Ritz-Carlton Hotel, Pentagon City
Arlington, Virginia

An international conference is planned dedicated to the enhancement of ideas concerning Advanced Marine Vehicles and to fostering communications between users and technologists in the field. The program will provide a wide forum for the exchange of information. In addition to the formal technical sessions, video sessions, program progress reports, exhibits and displays, demonstrations and field trips are planned.

Technical Presentations

Formal papers on modern craft and ships concepts, system and component characteristics, operations, test and evaluation, and engineering and economic analyses and comparisons are planned. Vehicle types include planing hulls, hydrofoils, surface effect ships, amphibious air cushion vehicles, SWATH, catamarans, etc., including near surface high performance vehicles such as WIGS and seaplanes.

For additional information contact:

Capt. James Grabb, USCG (Ret.)
HPMV '92
American Society of Naval Engineers
1452 Duke Street
Alexandria, VA 22314-3458
703/836-6727

Sponsor: American Society of Naval Engineers (Flagship Section)
Cosponsor: More than 10 societies are anticipating cosponsorship

Crowley marks 100 years of marine operations. The company's RoRo/containership MV SEA FOX, on the South American run.

Crowley Maritime Celebrates 100 Years Of Service

A highly diversified maritime service company and owner of one of the world's largest privately-owned tug and barge fleets, Oakland, California-based Crowley Maritime Corporation is commemorating its centennial in 1992.

Crowley Maritime began operations in 1892 when 17-year-old Thomas Crowley bought an 18-foot Whitehall rowboat for $80 and went into business serving the needs of ships in San Francisco Bay.

Shortly thereafter, he expanded his business with a pair of motor launches, and soon bought his first tugboat. In 1918, he became part-owner and manager of the Shipowners & Merchants Tugboat Company whose distinctive red smokestacks still exist today on over 400 Crowley vessels throughout the world and as the centerpiece of the Crowley logo.

Expanding its tug and towing activities, Crowley entered the coastwise-barge bulk-petroleum transport sector in 1947.

Begun in the 1950s, the company's Alaskan tug and barge operations mushroomed with the discovery of Alaska's north slope. Soon a thriving oil drilling service joined its oil transportation operation.

Crowley shifted some of the vessels that had been earmarked for Alaska to the Caribbean, and in 1974, the development of Trailer Marine Transport made Crowley a major presence in the Caribbean trade.

The acquisition of Delta Steamship Lines in 1982 expanded the scope of the company's operations in South America. Crowley sold Delta in 1984 to U.S. Lines, but soon returned to the subcontinent with a service to Columbia and additional Central American services. After U.S. Lines' bankruptcy in 1987, the company became a major player in the South American trade. Today, the South and Central American operations constitute roughly a third of Crowley's operating revenues.

Crowley Maritime Corporation itself was incorporated on January 1, 1973 as an amalgam of the firms owned by Tom Crowley prior to his death in 1970, and which were then managed and owned in part by his son, Thomas Bannon Crowley. Thomas B. Crowley still serves as chairman and chief executive officer of the company founded by his father in 1892. Over the past hundred years, Crowley and its predecessor companies have had only these two men at their helm.

After 98 years in San Francisco, in 1990 the corporation moved its headquarter across the bay to Oakland, California. The Crowley organization has offices and agents at over 100 major ports and cities around the world.

The many different Crowley companies form along two distinct business lines. As such, the company plans to restructure its organization to better reflect the services it provides. Effective on or about July 1,1992, all Crowley companies offering liner cargo and related services will become part of Crowley American Transport, Inc. All other diversified marine contract and related services will become part of Crowley Marine Services, Inc. Crowley Maritime Corporation will become a holding company, maintaining full ownership of these two new companies.

Washburn & Doughty Delivers Passenger/Auto Ferry Captain Henry Lee

The passenger/auto ferry Captain Henry Lee.

Washburn & Doughty Associates, Inc. recently delivered the passenger/auto ferry Captain Henry Lee to Maine State Ferry Service.

The vessel was designed by Rodney E. Lay Associates of Jacksonville, Fla., and partially funded by a grant from the Federal Transit Administration and State of Maine bonds. The Captain Henry Lee will join Maine State Ferry Service providing year round service on the Bass Harbor-Swan's Island Frenchboro Route. The vessel is the first state ferry to be built at a Maine shipyard in over 30 years.

The vessel is 130 feet long, with a beam of 36 feet and a draft of 10 feet. Power is provided by a CAT 3408 driving Twin Disc 516 (3-1/2:1) reduction gear which turns a Rice four-blade propeller. The design speed for the 325-grt vessel is 12 knots. The vessel has a capacity to carry 9,000 gallons of fuel oil, 500 gallons of fresh water, 250 passengers and 17 vehicles. There are also three Detroit Diesel 30-kw generators, two auxiliary and one emergency standby. Shafting is provided by Rose's Machine, with 4-1/2-inch tail shafts, and Aquamet 18, 3-1/2-inch line shafts and SKF hydraulic couplings. Steering is provided by Tenfjord. Electronics are provided by Chase Leavitt.

For further information detailing the services and facilities of Washburn & Doughty,

Circle 52 on Reader Service Card

CAPTAIN HENRY LEE
Equipment List

Main Engine	CAT 3408
Reduction Gear	Twin Disc
Propeller	Rice
Steering	Tenfjord
Generators	Detroit Diesel
Shafting	Aquamet

Adams Boat Co. Delivers Fishing Vessel To King Fisheries

Adams Boat Co., Inc. of Madison, Ind., recently delivered a 42-foot all-aluminum commercial fishing vessel to King Fisheries of Curtice, Ohio. The vessel will be used on Lake Erie for trap netting.

The vessel, Marlena, has a beam of 14 feet 10 inches, a 3-foot draft, carries 600 gallons of fuel, 100 gallons of hydraulic oil and 100 gallons of water. The hull and cabin were sandblasted and will remain unpainted above the water line.

The vessel is powered by a Volvo diesel TAMD71A rated at 358 hp at 2,500 rpm. The engine drives a four-blade propeller through a 2:1 twin disc 507A gear. A speed of 25.5 knots was reported with 500 gallons of fuel and four passengers aboard during sea trials.

The Marlena is equipped with Hynautic steering, Kobelt controls and a Fernstrum gridcooler, all contained in two control stations.

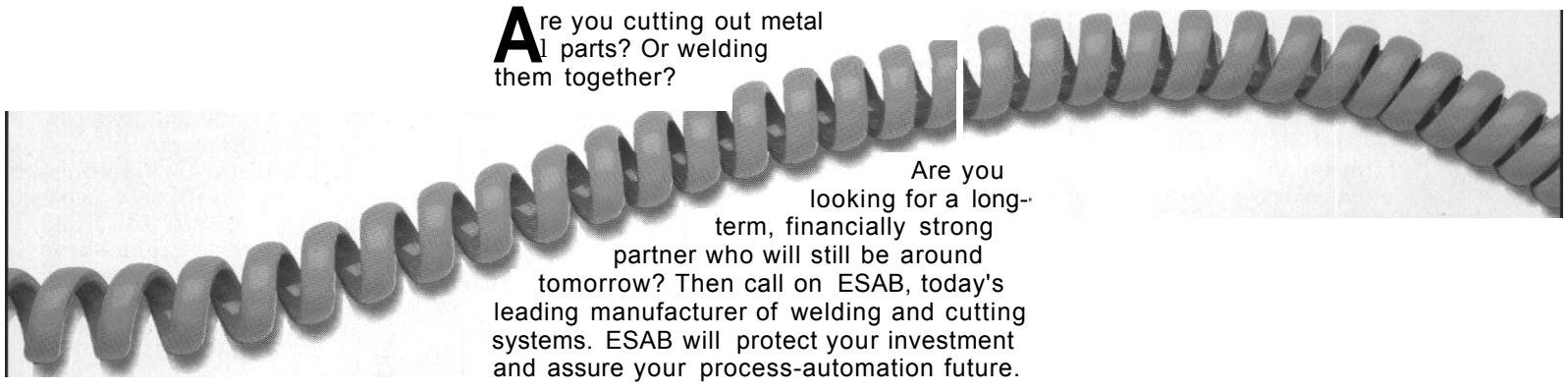
For further information about the services of Adams Boat Co.,

Circle 8 on Reader Service Card

To get automation in your process, get this number on your phone.

1-800-242-ESAB

Are you cutting out metal parts? Or welding them together?



Are you looking for a long-term, financially strong partner who will still be around tomorrow? Then call on ESAB, today's leading manufacturer of welding and cutting systems. ESAB will protect your investment and assure your process-automation future.

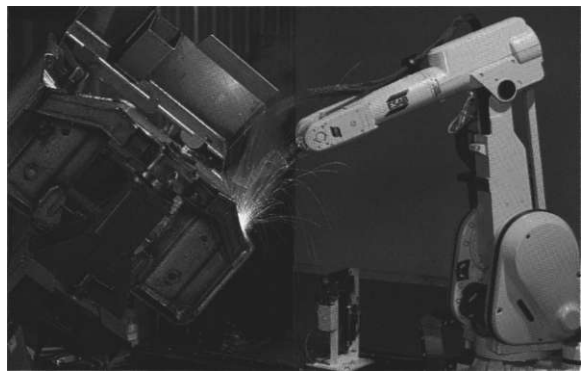
For "Modular Concept" Robotic Welding Systems.. .ESAB Gives You More.

Top robotic reliability

Designed to maintain accuracy and repeatability for over 40,000 hours. That's two-shift production for 10 years!

Fast start-up

Production launch assistance, from concept to completion, can even include turn-key installation.



Automation that meets your needs

ESAB offers everything from a single start-up cell to fully-automated Flexible Manufacturing Systems (FMS).

Applications experience

There are over 800 ESAB robotic arc welding installations in North America alone, and 5,000-plus worldwide.

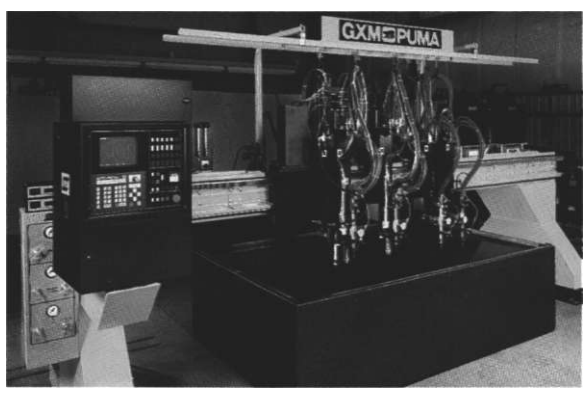
For Automated Cutting Systems ... ESAB Gives You More.

Technological leadership

ESAB technology puts you in front of your competition and keeps you there.

Single-source responsibility

Eliminate problem-solving hassles. ESAB is both the equipment manufacturer and the system integrator.



Worry-free compatibility

ESAB makes sure that all the components work together, from NC programming/nesting to water tables and material handling.

No-compromise flexibility

Select from a wide variety of controls and cutting tools.

Ask about our **free** Video Demonstrations.

ESAB

ESAB Automation, Inc.
P.O. Box 2286
Fort Collins, CO 80522

Engineering Solutions for Welding and Cutting

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International Tug & Salvage Expo 1992

Show Set for May 27-29, Genoa, Italy

The next (12th) International Tug & Salvage Exhibition will incorporate the Genoa Workboat Show, bringing two exhibitions under one roof at the international fairground in Genoa, Italy, May 27-29, 1992, during the gathering of executives involved in the tug, towage and salvage business. This combination greatly enlarges the scope of products and services on display, and also serves to provide the widest possible appeal to trade visitors.

The International Tug & Salvage Exhibition has been held biennially all over the world during the last 20 years. Well over 3,500 executives involved in the tug and salvage business have attended these events which have been held in London, Vancouver, New Orleans, Rotterdam, Hamburg, Singapore, Sydney and Halifax.

Thanks to the unique combination of "two fairs under the same roof," the Genoa Workboat Show will be a showcase for anyone involved with commercial craft and associated equipment or services with a vast range of products and services directly relevant to owners, operators or users of small and big commercial craft. Many boats will be available for demonstration to allow the visitors to view and test a prospective purchase. The show will present everything from winches to propellers, from radar to pumps.

Parallel to the Genoa Workboat Show/Tug & Salvage exhibition, there will be a series of new product seminars held by leading people of the industry who inform the visitors of new technologies and development of the sector.

The 12th International Tug & Salvage Convention, one of the world's largest gatherings of senior executives involved in the tug, towage and salvage industry, will take place in Italy for the first time, at the Grand Hotel Miramare, Santa Margherita-Portofino.

The convention papers, delivered by highly qualified speakers from all over the world, will cover specific marine salvage topics as well as traditional tug-related subjects.

Simultaneous English/Italian translation will be available, and preprints of the papers will be sent to registered delegates well in advance of the convention in order that they may have a chance to study them and prepare questions. Speakers will give a resume of their papers, and an equal amount of time will be given over to discussion.

The recognition of the Genoa Workboat Show as a show of prime importance is demonstrated by the active participation of the Port of Genoa and the National Passengers Transport Association, gathering the main Italian companies who operate in this sector.

As an integral part of the convention there will be a full social program to which delegates' partners are invited.

For further information, contact: Expoconsult s.r.l., Galleria del Corso, 2 - 05100 Terni, Italy, phone ++39 744 400.544, fax ++39 744 451.235.

Kaldnes Shipyard To Concentrate On Offshore Sector

Kaldnes Shipyard in Tonsberg, Norway, recently announced that it will be switching its specialty to the offshore sector in July. The yard presently specializes in the construction of tankers and general cargo carriers up to 30,000 tons.

The reason for the switch was given as lost revenue and poor market conditions.

Plans for the yard call for it to be involved in the fabrication sector of the offshore industry. Kaldnes is involved in the offshore sector in a joint venture with Heerema.

Capabilities Of Trinity Marine's New Beaumont Yard Highlighted

The Trinity Marine Group (TMG), of Gulfport, Mississippi, recently conducted a week long sales and marketing drive through New York and New Jersey to promote the group's 11 shipyards, particularly its newly renovated yard in Beaumont, Texas.

Mr. **Walter W. Rody,** of TMG, gave luncheon presentations to senior managers from ship and barge operators in both states. During the meetings Mr. Rody showed a 12 minute video about the facilities of TMG before beginning his discussion on Trinity Beaumont.

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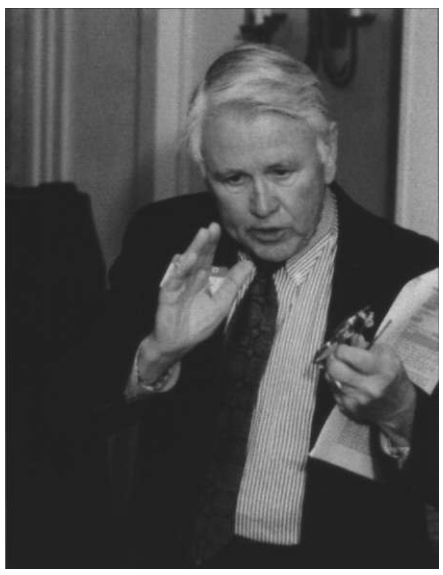

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Robert Mende (left), former SNAME executive director, receiving the Vice Admiral (Jerry) Land Medal from C. **(Larry) French** for his "outstanding accomplishments in the marine field."

Mende Honored For Accomplishments In Marine Field

Former Society of Naval Architects and Marine Engineers (SNAME) executive director **Robert G. Mende** has been presented with the Vice Admiral (Jerry) Land Medal for "Outstanding Accomplishments in the Marine Field." The award was presented by C. **(Larry) French.**

In addition, to further honor Mr. **Mende,** the society's headquarters in Jersey City, N.J., was named the Robert G. Mende Building.

In making the presentation, **Ronald K. Kiss,** SNAME president, said, "He has guided the society with loyalty, strength, efficiency and total dedication through a period of great change in the art and science of ship design and construction in the United States."

Mr. **Mende,** who served as society executive director from 1969 to his retirement the first of this year, was cited for his guidance of the society, making it more internationally oriented, expanding the scope of its technical and research program to include committees dedicated to ship design, ship production, small craft and specialized offshore engineering.

A graduate of the SUNY Maritime College at Fort Schuyler and recipient of a Bachelor of Science in Naval Architecture and Marine Engineering from Webb Institute, Mr. **Mende** held the position of society executive director longer than any other individual.

Francis M. Cagliari was named to succeed Mr. **Mende** as SNAME

NRC, Coastal And Phibro To Support Second National Response Network

The Coastal Corporation, the National Response Corporation (NRC) and Phibro Energy, Inc. recently announced that they intend to support the creation of a second regional response network to serve vessel and facility owners seeking compliance with OPA-90.

Officials of Phibro Energy and Coastal expressed confidence that the NRC network would offer independent refiners, terminals and vessel owners an opportunity to comply with OPA-90.

The NRC network will serve the U.S. East and Gulf coasts and inland waterway system initially.

It has been reported that plans are underway to modify 12, 180-foot offshore work vessels to serve as skimming and primary recovery boats. Eight of these vessels will operate in the Gulf of Mexico and the other four will be located on the East Coasts from Miami to Boston.

NRC plans to order 220,000 feet of protective boom and 103 high-capacity skimming units. Support equipment will include landing craft and technical command and communications centers for controlling operations.

NRC is planning to create programs to meet the customers needs and whenever possible integrate with customers, cooperatives and contractors, drawing on available equipment, personnel and warehouse space.

In addition to the eight vessels in the Gulf of Mexico, NRC will also have access to the Seacor Marine Fleet, which includes high-horsepower vessels and additional supply vessels.

NRC is a joint venture owned by Seacor Holdings Inc., the Miller Environmental Group and Olympic Marine.

U.S. NAVY FY 1993

New Budget Proposes Over $23.3 Billion For New Ships, Repair & Ship Equipment

Total Military, Government Maritime Spending Would Exceed $30 Billion

Although scaled back, the new Fiscal Year (FY) 1993 U.S. Navy budget, if approved, will offer a substantial number of market opportunities for U.S. shipbuilders and vessel repairers, ships, equipment suppliers and allied industry support firms. The FY 1993 budget proposes funding of $23.3 billion for the construction, conversion and repair of ships, procurement of ships' equipment and research, development, testing, and evaluation.

Furthermore, market opportunities could result from the President's proposed National Defense Sealift Fund (NDSF), which would be created for the purpose of acquiring and maintaining necessary sealift capability. If approved, the NDSF would initially start out with $3.1 billion in FY 1993.

Table 1—FY 1993 Navy Budget At A Glance

New Ship Construction	$5.32 billion
Ship Repair & Modernization	$3.55 billion
RDT&E	$8.52 billion
Other Ship Equipment	$5.86 billion
Navy Total*—	**$23.25 billion**
Sealift Total--	**$3.10 billion**
Coast Guard Total--	**$3.72 billion**
MarAd Total-	**$0.31 billion**
TOTAL MILITARY, GOV'T	**$30+ BILLION**

***Note:** Approximately 70 percent of Navy ship construction, ship repair and modernization funds are used by shipyards to purchase equipmentfrom outside suppliers. This amounts to approximately $6.2 billion for FY 1993. Add to this the $5.86 billion proposed for other equipment, and the **total Navy spending for ship equipment in FY 1993 is approximately $12.06 billion.**

The recently christened USS Cape St. George, Navy's newest cruiser under construction at Ingalls Shipbuilding division of Litton in Pascagoula, Miss.

$5.32 Billion For New Ships

The Navy Shipbuilding and Conversion (SCN) appropriation request of $5.32 billion in FY 1993 will fund six new construction ships. These ships include four Arleigh Burke Class guided missile destroyers (DDG-51) and two Osprey Class coastal minehunters (MHC-51). An advance procurement request of $832.2 million is also included for long-lead nuclear components in support of a replacement aircraft carrier planned for FY 1995.

The FY 1993 program includes $19.5 million for an oceanographic ship conversion program to convert retiring T-AGOS Class ships to fulfill oceanographic research requirements. Additionally, advance procurement of $6.8 million and $30.4 million is included to support future refueling overhauls of CVNs and CGNs, respectively. The remaining $814.8 million primarily supports service craft, outfitting, and post delivery requirements.

Significant changes in the FY 1993 budget request from the FY 1992/FY 1993 Amended President's Budget submission include the deletion of one Seawolf Class attack submarine (SSN-21), one Dock Landing Ship, Cargo Variant, (LSD-CV), one ocean surveillance ship (T-AGOS), and one oceanographic survey ship (T-AGS). These ships have been deleted in light of fiscal constraints and as a result of re-evaluation of program requirements.

Due to the significant cost, complexity and the length of these type availabilities, the appropriation includes refueling overhauls of nuclear carriers and cruisers in order to reflect these availabilities as a major capital investment.

$3.6 Billion For Ship Repair & Maintenance

Funded at $3.55 billion, the FY 1993 budget reflects a rebalancing of the overall ship maintenance program. Ship Depot Level Repair funding decreases in FY 1993, as previously deferred maintenance and Desert Storm-related maintenance is completed during FY 1992. FY 1993 funding supports 10 overhauls, including an extensive COH for the aircraft carrier USS John F. Kennedy (CV-67), the overhaul of the ballistic missile submarine USS Ohio (SSBN-726) and the refueling overhaul of two Los Angeles Class submarines. Funding in FY 1993 also reflects the transfer of nuclear cruiser refueling funds from the Operation and Maintenance account to the Shipbuilding and Conversion account.

FY 1993 inactivation funding at $335 million includes the decommissioning funds for the retirement of the aircraft carrier USS Ranger (CV-61) and advance planning funding for the FY 1994 inactivation of the nuclear-powered cruiser USS Long Beach (CGN-9).

$8.52 Billion For RDT&E

The appropriation request for Research, Development, Testing & Evaluation (RDT&E) is $8.52 billion in FY 1993. Part of the budget reflects an increase of $40 million as a result of the lessons learned from Operations Desert Shield/Desert Storm.

One significant program funded in the FY 1993 budget is the continued development of electric drive. Program funding has been proposed at $99.2 million, a substantial jump over FY 1992's funding of $39.3 million.

Additionally, part of the $5.1 billion funding proposed for tactical programs includes the continued development of an advanced amphibious assault vehicle, electronic warfare systems, and a next generation submarine.

$5.9 Billion Requested For Ship Support Equipment

The appropriation request of $5.86 billion in FY 1993 will fund the procurement of ship support equipment, communications and electronics equipment, aviation support equipment, ordnance support equipment, civil engineering, supply and command support equipment, and spares and repair parts.

The FY 1993 program includes Ships Support Equipment budgeted at $1.39 billion. Items procured in this budget activity include propulsion, safety and pollution control equipment, as well as design efforts associated with the modernization of Navy platforms. The most significant change from the FY 1992/FY 1993 Amended President's Budget is the transfer to the SCN appropriation of $17.7 million to procure components associated with the refueling of nuclear-powered surface ships.

Communication and electronics equipment is budgeted at $2.13 billion in FY 1993. This Budget Activity

funds the procurement and installation of the latest communication systems such as the SHF Satcom ship terminal, as well as the improvement of current weapon systems. The budget also includes $62.9 million to support the multiyear procurement of the Enhanced Modular Signal Processor (EMSP). As a result of Operation Desert Storm, an increase of $30.7 million was budgeted for EHF satellite terminals for surface ships and submarines, bringing the total to $193.6 million.

$3.1 Billion In NDSF For Ship Acquisition, Maintenance

A mobility requirements study recently forwarded to Congress identified the need for additional Roll-On/Roll-Off (RO/RO) vessels for prepositioning and surge shipping. The study also recommended a further expansion of the Ready Reserve Force (RRF) through the acquisition of used ships or, alternatively, charter, build and charter, and military-useful features in new commercial ships or a combination of these programs. The NDSF would be used to obtain and maintain this capability, as well as additional sealift capability for force sustainment, primarily tankers and containerships.

Initial capitalization of the fund would be accomplished through the transfer of existing shipbuilding appropriations provided by the Congress for sealift totaling about $1.9 billion, as well as an additional $1.2 billion requested in the amended FY 1993 President's budget. Additional appropriations would be requested in future years.

The fund would fall under a cooperative management agreement between the Navy and the Maritime Administration.

At present, design contracts have been awarded to nine shipyards, and construction contracts may be awarded as early as the spring of 1993 whether the NSDF is authorized or not.

In a statement before a subcommittee of the House Armed Services Committee, Rear Adm. **R.D. Milligan,** Director of Budget and Reports, Office of the Comptroller of the Navy, said, ". . . the creation of the National Defense Sealift Fund will provide the necessary tools for the department to economically acquire and maintain necessary sealift capability over the long-term."

Total Market: $30+ Billion

In summing up, Navy ship construction, vessel repair and maintenance, ships equipment and research, development, testmgandevaluation will amount to over $26 billion. Combined with U.S. Coast Guard and Maritime Administration appropriations of $3.72 billion and $312 million, respectively, total expenditures government and military-related maritime programs if approved would top $30 billion. Highlights of the Coast Guard and MarAd budget are detailed on page 71.

Table 2—Shipbuilding & Conversion (in millions of dollars)

	FY 1991		FY 1992		FY 1993	
New Construction						
Trident (SSBN)	1	1,282.2	–	–	–	
Carrier Replacement	–	–	–	–	–	832.2
Seawolf (SSN-21)	–	400.0	–	48.3	–	–
Arleigh Burke (DDG-51)	4	3,145.	5	4,064.0	4	3,369.6
Wasp (LHD-1)	1	1,123.1	–	–	–	–
Surveillance (TAG0S)	–	–	1	148.5	–	–
Supply (A0E)	–	–	1	499.1	–	–
Research (AG0R/TAGS)	–	–	2	99.8	–	–
Landing Craft (LCAC)	12	263.4	12	264.8	–	–
Minehunters (MHC)	2	200.6	3	349.6	2	246.2
LSD-41	1	238.7	–	25.0	–	–
Subtotal-	**21**	**$6,653.1**	**24**	**$5,497.1**	**6**	**$4,446.0**
Conversions						
Oceanographic Ship	–	–	–	–	1	19.5
Kennedy CV SLEP	–	82.0	–	–	–	–
Service Craft	–	75.4		35.4		200.2
Landing Craft	–	1.7	–	–	–	–
CVN Refuels/Overhauls	–	–	–	–	–	6.8
CGN Refuels/Overhauls	–	–	–	–	–	30.4
Escalation	–	–	–	453.4	–	–
Other Costs	–	562.1	–	467.7		614.6
Total—	**21**	**$7,374.3**	**24**	**$6,463.8**	**7**	**$5,319.5**

Source: U.S. Navy

Table 3—Ship Repair & Maintenance (in millions of dollars)

	FY 1991	FY 1992	FY 1993
Ship Overhauls	2,823.2	3,125.3	2,535.9
Depot Level Support	197.9	304.9	233.4
IMA	472.6	504.7	448.9
Inactivations	367.5	457.8	335.0
Total—	**$3,861.2**	**$4,392.7**	**$3,553.2**
# of Ship Overhauls (units)	14	14	10
# of SRAs (units)	72	96	64
# of PMAs (units)	60	72	42

Table 4—Other Procurement (in millions of dollars)

Equipment Type	FY 1991	FY 1992	FY 1993
Ships Support	1,455.4	1,791.5	1,392.6
Communications/Electronics	1,814.3	2,243.9	2,125.6
Aviation Support	392.1	362.3	400.9
Ordnance Support	499.2	536.8	685.1
Civil Engineering Support	89.7	292.1	**82.8**
Supply Support	237.1	162.4	149.1
Personnel & Command Support	717.8	426.2	452.2
Spares & Repair Parts	244.5	276.3	279.9
Outfitting Spares	271.4	215.0	300.6
Total-	**$5,721.6**	**$6,306.5**	**$5,868.8**

Table 5—Navy Shipbuilding & Conversion Six-Year Plan

New Construction	FY92	FY93	FY94	FY95	FY96	FY97
Carrier Replacement				1		
DDG-51	5	4	3	4	4	4
LHD-1					1	
LX				1		1
MHC	0	9				
MHC(V)				1		2
AR					1	
TAG0S	1		1	2		1
A0E	1					
Oceanographic Research	2					
LCAC	12					
TOTAL, NEW SHIPS—	24	6	6	9	6	8
Conversion						
Oceanographic Ship		1	2	2		
CGN Refuels/Overhauls			1		1	1
TOTAL, ALL SHIPS—	24	7	9	11	7	9

Source: U.S. Navy

AT&T Contract For ASW Components Could Total $265 Million

AT&T Federal Systems, Greensboro, N.C., has signed a contract with the U.S. Navy for additional production of its Enhanced Modular Signal Processor (EMSP). The new contract, which could total as much as $265 million over its five-year term, provides for the production of 150 EMSP machines which will be used in five major antisubmarine warfare (ASW) systems.

"This agreement represents a very major milestone in the life of the EMSP program, said **Lawrence E. Hooker,** director, AT&T Signal Processing Programs. "Built to the Navy's Standard Electronic Module Format E (SEM E) specifications, the EMSP will further enhance antisubmarine capabilities of Navy submarines, helicopters and surface ships."

Signal processor computers are a critical part of the Navy's acoustic and nonacoustic systems. ASW crews depend on them to analyze a myriad of underwater noises created by sea life, shipping—and submarines hiding in the depths.

The new contract will be managed at AT&T Federal Systems' Guilford Center facility near Greensboro, N.C. Production will be done at AT&T's new Falcon Manufacturing Complex also near Greensboro.

For free literature detailing AT&T,

Circle 55 on Reader Service Card

$271,000 Repair Contract To Holmes Brothers

Portsmouth, Virginia-based Holmes Brothers Enterprises, Inc. has received a $271,000 contract from the Navy to overhaul the pumps, valves and clean bilges aboard the submarine tender USS Hunley (AS-31).

$ 1.6 Million Repair Of Carrier 'Kitty Hawk' At A&E Industries

The aircraft carrier USS Kitty Hawk (CV-63) will undergo repairs at A&E Industries, Inc., National City, Calif., under a $1.6 million Navy contract.

San Pedro Boat Works Receives $509,872 For Overhaul Work

The Navy vessels SWOB-5 and SWOB-10 will undergo regular overhauls at San Pedro Boat Works, San Pedro, Calif., under a $509,872 contract.

'Ranger' To Undergo Repairs At Pacific Ship

The aircraft carrier USS Ranger (CV-61) will undergo repairs at Pacific Ship Repair & Fabrication, Inc., San Diego, Calif., under a $534,487 Navy contract.

Navy Expects To Award First Contracts From Sealift Fund In Early '93

Naval officials have told Congress that the U.S. Navy expects to award its first contracts to private shipyards from its proposed $3 billion National Defense Sealift Fund early in 1993.

They added that the timing will depend on how quickly Congress and the Bush Administration can resolve differences over the scope and structure of the sealift fund.

Rear Adm. **R.D. Milligan,** director of the budget and reports office of the comptroller of the Navy, said. "We want a build-and-charter program that would allow the expansion of sealift without additional costs to the taxpayer."

Under the program, the Navy will acquire through construction and conversion, 20 large roll-on/roll-off vessels; lease two containerships for prepositioning; and expand the reserve fleet from the current 96 ships to 142.

Admiral **Milligan** said that in addition to providing work to U.S. shipyards, the new ships will open a lot of seagoing jobs for maritime workers.

Ronald K. Kiss, a deputy assistant secretary in the Navy's office for research, development and acquisition, said the Defense Acquisition Board, an internal Pentagon group, is likely to approve the $3 billion by May 1992.

All U.S. sealift financial resources, under the program, will be concentrated under a single management structure. Mr. **Milligan** said it will involve some sort of cooperative arrangement between the Navy and the Maritime Administration.

ATL Awarded $5.7 Million Navy Charter Contract

American Transport Line Ltd., of Jacksonville, was awarded a $5,759,000 firm fixed-price contract by Military Sealift Command's (MSC) Central Technical Activity for the 6-month charter of the MTV American Condor.

A Roll-on/Roll-off vessel, the MA/' American Condor will be operating from the U.S. West Coast to the Far East, transporting Department of Defense vehicles and heavy lift cargo.

Delta Marine Drydocks Cutter Redwood

Delta Marine Corp., Wilmington, N.C., is drydocking the U.S. Coast Guard cutter Redwood under a $217,640 contract.

FY 1993 Budget For Coast Guard Shows Increase Over FY 1992

$3.72 Billion Appropriated

For Fiscal Year (FY) 1993, the budget proposes a funding level of $3,718 billion in appropriations for the U.S. Coast Guard, a five percent increase over the FY 1992 level. Included in the total are $203 million to be transferred from the Department of Defense and $70 million from the Oil Spill Liability Trust Fund.

The budget assumes the collection of $117 million in user fees for selected Coast Guard services.

Highlights of the USCG budget include:

Operating Expenses—The $2.603-billion request funds continued operation and maintenance of a wide range of multimission vessels, aircraft, shore units and aids-to-navigation. Within the funding are:

—$142.1 million to be funded by the Department of Defense for transfer to Coast Guard;

—$31.9 million from the Oil Spill Liability Trust Fund;

—$35 million from the Boat Safety account.

Capital Improvement—The $414-million request funds continued replacement and modernization of major components of the Coast Guard's extensive vessel and boat fleets, including buoy tenders, motor life boats, patrol boats and icebreakers. Within the funding are:

—$18 million to be funded by the Department of Defense for transfer to Coast Guard;

—$33.8 million from the Oil Spill Liability Fund;

—$132 million for shore facility renovation and construction.

Environmental Compliance & Restoration—The $30.5-million request is a 42 percent increase over FY 1992. Funding will be used to carry out the Coast Guard's responsibility to improve environmental problems resulting from construction and operation of former and current service facilities.

Research Development, Test & Evaluation—The $29.9-million request will be used to provide development of equipment and methods which contribute to increasing the productivity of the Coast Guard's operating programs. Funding includes:

—$4 million from the Oil Spill Liability Trust Fund.

Boat Safety Grants—The $35-million authorization will assist states in the development and implementation of a coordinated National Boating Safety Program.

Oil Spill Cleanup and Initial Damage Assessment—The $50-million appropriation from the Oil Spill Liability Trust Fund will be used to finance cleanup and assessment operations. In addition, the Coast Guard will pay valid uncompensated claims of parties suffering damages from oil spills.

Appropriations Of $312 Million Requested For MarAd In FY 1993

For the Maritime Administration (MarAd), appropriations of $312 million are requested for FY 1993.

Highlights of the MarAd budget include:

Ready Reserve Force—The $234-million funding is the same as the FY 1992 level. MarAd will maintain the readiness of the fleet and continue acquisitions toward meeting the Department of Defense requirement of a 142-ship RRF fleet. The RRF fleet is needed to provide basic logistic support for deployed forces during the initial surge period of an armed conflict. The current fleet includes 96 vessels of which 79 were activated in support of Operation Desert Shield/Desert Storm.

Operations & Training—The $78 million funding is an increase of $5.2 million over the previous fiscal year. The funding will provide continued support of the U.S. Merchant Marine Academy and support State maritime schools, management of maritime promotional programs, operation and maintenance of the National Defense Reserve Fleet (exclusive of the RRF), and research and development program.

Operation Differential Subsidies—An appropriation to liquidate contract authority of $225 million in FY 1993 is requested. No appropriation of budget authority is required under current law for Operating Differential Subsidies because existing subsidies are covered by prior years' contract authority.

Title XI Federal Ship Financing—No new commitments for loan guarantees for ship construction are projected in FY 1993.

Ocean Freight Differential—No annual appropriation is requested for this program since it has a permanent indefinite appropriation to liquidate debt. For FY 1993, $51 million in permanent authority is estimated for this portion of the Federal Government's cargo preference program.

MarAd Awards Yards Layberthing Contracts Worth $18 Million

The Maritime Administration (MarAd) has awarded five contracts, totaling about $18 million, for layberthing of Ready Reserve Force (RRF) vessels which participated in Operations Desert Shield/Desert Storm. The contracts, with four one-year renewal options, provide for berthing, electric power, water and telephone service.

The following shipyards received the layberthing awards (contract values include option periods):

Commodores Point Terminal Corp., Jacksonville, Fla., $2.83 million for RO/ROs Cape Decision and Cape Douglas;

Fort McHenry Shipyard Inc., Baltimore, Md., $1.29 million for breakbulk vessels Cape Catoche and Cape Carthage;

Mobile Dock Services, Inc., Jacksonville, Fla., $4.76 million for RO/ROs Cape Lambert and Cape Lobos, and breakbulk vessel Santa Ana;

Violet Dock Port, Inc., Violet, La., $3.72 million for the LASH vessels Cape Florida, Cape Farewell and Cape Flattery;

Virginia Maritime, Inc., Jacksonville, Fla., $5.33 million for Seabarges Cape May and Cape Mendocino, and auxiliary crane ship Gopher State.

Larson Boat Wins $954,980 Contract For Barge Overhaul

A1 Larson Boat Shop, Terminal Island, Calif., recently received a $954,980 contract from the Supervisor of Shipbuilding, Conversion and Repair, San Diego, for the regular overhaul of the self-propelled gasoline barge YOG-88.

The USS Heron (MHC-52), second of a new class of GRP-hulled U.S. Navy minehunters built by Intermarine USA, Savannah, Ga.

Intermarine USA Launches Second Navy Minehunter

The Savannah, Ga., shipyard of Intermarine USA recently launched the U.S. Navy ship Heron (MHC-52), the second in a series of advanced minehunter vessels.

The Heron is constructed entirely of glass reinforced plastic (GRP) to a design first developed for the Italian Navy Lerici Class minehunters. The technology was transferred to the U.S. Navy Coastal Minehunter Program under a unique arrangement managed by Intermarine USA, a subsidiary of Intermarine SpA, a Ferruzzi Group company.

Among the dignitaries in attendance were Georgia Senator **Wyche Fowler, Boris Biancheri,** the Italian Ambassador to the U.S., and several senior-ranking U.S. Navy personnel and Ferruzzi Group officials.

The ship's sponsor was **Mrs. Leonard McRoskey,** wife of the former Deputy Assistant Secretary of the Navy for Reserve Affairs.

The ship is a larger version of the successful Lerici Class Italian Minehunters that were so effective in the Persian Gulf mine clearance during Operation Desert Storm. The Heron is 188 feet long, 890 metric tons in weight and built entirely of flexible and resilient fiberglass to ensure her survival in the event of a close mine explosion. Her crew of 51 sailors will search for mines with a high definition, variable depth sonar and neutralize them with a remotely controlled robot submarine. Systems on board include the Raytheon minehunting sonar AN/SQQ-32 and Alliant Techsystems mine neutralization system.

Propulsion for the vessel is provided by two Isotta Fraschini 8V AM ID36 amagnetic diesel engines, rated at 800 hp each at 1,800 rpm, and two Voith-Schneider cycloidal propellers.

Heron is the second ship of the Osprey (MHC-51) Minehunter Class. The design integrates modern mine countermeasures technology proven in the Persian Gulf into a unqiuely designed platform with exceptionally low magnetic and acoustic signatures to protect against mine detonations during minehunting operations.

Heron will be commissioned by the U.S. Navy and join her sister ship Osprey following an extensive test and trials program in 1993. Intermarine's third Navy minehunter, Oriole, is also under construction in Savannah.

The program to transfer Italian designer and construction technology to U.S. Navy Mine Warfare shipbuilding programs began in 1986 with the award of a design contract to Intermarine SpA. Intermarine USA was established in 1987 to build these ships for the U.S. Navy. The construction contract for Heron was awarded to the company by the Naval Sea Systems Command in 1989.

For free literature on the boatbuilding services of Intermarine USA,

Circle 28 on Reader Service Card

Two Yards Awarded Deactivation Contracts

The Maritime Administration (MarAd) has awarded two contracts worth a total of $5.2 million for deactivation and voyage repairs on the breakbulk vessels SS Santa Ana and SS Banner.

Mobile, Ala.-based Bender Shipbuilding & Repair Co., Inc., has been contracted under a $2.3 million award for the SS Santa Ana, and Stevens Technical Services, Brooklyn, N.Y., has received $2.41 million for the SS Banner.

DECK MACHINERY & CARGO-HAN DUNG EQUIPMENT

- A Review -

The following is a brief overview of some the latest developments in the deck machinery and cargo-handling equipment market. The review is based on a survey conducted by the editors of MARITIME REPORTER of the leading marine manufacturers and suppliers from the U.S. and around the world.

Free literature describing all the equipment featured in this review is available from the manufacturers and suppliers. To receive additional information, circle the appropriate Reader Service Number(s) listed under each company's name on the postpaid Reader Service Card bound into the back of this issue.

ALL SET MARINE LASHING

Circle 35 on Reader Service Card

Since 1978, Sweden's All Set Marine Lashing has designed and supplied cargo lashing equipment to major shipping lines, primarily for container ships.

The company's semiautomatic twistlock, C5AM, is now in service on all APL ships calling at U.S. ports. All Set Marine Lashing reports that the twistlock system offers increased operational safety, as well as increases productivity by as much as two to four moves per hour.

The C5AM-DF (dual function mode) twistlock system is in service aboard Evergreen ships. The dual function twistlocks can be used in automatic mode (coning/deconing on dock) or in manual (coning/deconing onboard), providing the terminal with an option that best suites its needs. Major shipping lines NOL and Sea-Land have also selected the C5AM-DF twistlock system.

All Set Marine has also recently delivered its new turnbuckle Equalash to Evergreen Line. All Set Marine claims that the Equalash, developed as an improvement of the paralash system, has lighter rods, fewer parts, is easier to operate, is lower in price, but offers the same strength as the paralash system. Equalash has been in service on ANL and K-Line ships for over one year.

AMCLYDE

Circle 83 on Reader Service Card

AmClyde Engineered Products, Inc., based in St. Paul, Minn., is one of the world's premier designers and builders of large specialty equipment for lifting, pulling, moving and mooring the heaviest loads in the offshore oil and gas market, for shipyards, for material handling and for U.S. Government installations.

The Pallet Swinger, the latest development from Hagglunds, has been installed on a number of new reefer vessels.

Since 1892, AmClyde has supplied customers with over 10,000 cranes and winches for their operating fleets.

AmClyde maintains leading technology for mooring deep water drilling and production platforms, as well as ship sets.

Shell Offshore Inc., for example, has awarded AmClyde a contract worth in excess of $11 million to design and furnish what will reportedly be the world's largest lateral mooring system, cranes and conventional drum winches for the over $1 billion Auger Project which will operate in 2,860-foot water depths.

Lambert's Point Docks, a subsidiary of Norfolk Southern Corporation, purchased two large multipurpose level luffing traveling gantry cranes to enhance its capability of establishing itself as a maj or commodities and container terminal on the U.S. East Coast.

At the core of AmClyde's success is its engineering design capability. The company specializes in pure engineering consulting and also helping customers develop innovative solutions to complex problems.

CRANDALL DRY DOCK

Circle 96 on Reader Service Card

Crandall Dry Dock Engineers, Inc., of Dedham, Mass., is the sole North American agent for Establissements Marit of St. Amand-les-Eaux, France, a family-owned and -operated firm since 1904. Ests. Marit manufactures high quality marine chains ranging in size up to 100 mm in diameter. Marit's philosophy has always been one of top quality at a reasonable price. To insure this, the latest manufacturing technology as well as constant monitoring of production procedures is employed. Marit chain can be manufactured to meet the requirements of V eritas, Det norske Veritas, Lloyd's Register of Shipping, and the American Bureau of Shipping. Additionally, Marit has been awarded RAQ2 probate quality by the French Navy.

Marit offers the following products: stud link anchor chain, antimagnetic chain, carbon and special steel chain, chain with antiwear heat treatment, open-link chain (calibrated and uncalibrated), special swivels, shackles, connecting links, high efficiency anchors, quick release hooks, and other marine chain-related items.

CROSBY

Circle 117 on Reader Service Card

The Crosby Group manufactures one of the widest lines of construction blocks in the world. Additionally, the Tulsa, Oklahoma, company, a subsidiary of Amhoist, can also custom engineer and design a block to match a customer's needs. The company's engineers utilize advanced CAD/CAM technology, as well as quality materials and manufacturing processes.

CROSS EQUIPMENT

Circle 91 on Reader Service Card

Cross Equipment, Houma, La., was formed to serve the needs of the oil and gas industry for used and remanufactured marine and deck equipment. The company has an extensive inventory of new surplus and used winches, cranes, deck machinery and other marine related equipment.

A sister company to Houma-based Smatco Industries, Cross Equipment utilizes Smatco's 51,000-square-foot facility for all its repair and remanufacturing work.

Some of Cross Equipment's most recent projects consist of the delivery of two eight-point mooring systems, which included winches and fairleaders for installation on two drilling barges for Atlantic Pacific Marine Corporation. The company also furnished two eight-point mooring systems consisting of fairleaders, winches and Martin Decker Dynalines, which were installed on Falcon rigs 50 and 51 for a drilling project in Lake Maracaibo. Cross Equipment just delivered a remanufactured Smatco single drum towing winch to Dunlap Towing in Washington and a remanufactured Intercon single drum towing winch to Dann Ocean Towing in Florida.

At present, Cross Equipment is outfitting a barge with a six-point mooring system with deck sheaves and fairleaders.

DEL GAVIO MARINE HYDRAULICS

Circle 73 on Reader Service Card

Del Gavio Marine Hydraulics, Inc., Carlstadt, N.J., maintains a full-service hydraulic repair facility for the overhaul and repair of all types of electrohydraulic deck winches and windlasses.

Del Gavio has completed an emergency repair of a double-drum mooring winch aboard the SS Mormacsun at Port Elizabeth, N.J. Without any advance arrangements, the complete rotating assembly was removed from the vessels and stripped down. A badly corroded shaft was repaired and machined. All new bushings, bearings and

retainers were fabricated and fitted and the unit was reassembled, reinstalled and tested within 72 hours.

Del Gavio offers emergency and routine service from its facilities at Carlstadt, N.J., and Oakland, Calif., on a worldwide, around-the-clock basis. The firm is especially experienced with older Western Gear and Hyde systems, as well as more modern systems such as Brattvaag, Fukushima, Skagit and Hagglunds. Other company services include assistance in the design of new systems or modification of existing systems.

EFFER

Circle 82 on Reader Service Card

Since 1975 Italy's Effer SpA has put considerable effort into the engineering and manufacturing of hydraulic cranes for marine applications. Through its past experience, Effer has gained a vast amount of knowledge concerning anti-corrosion treatment to crane components. Effer marine cranes are specifically designed and assembled for use in a salt-water environment. All Effer cranes are designed and produced according to the standard DIN 15018.

The company's range of marine cranes falls into four categories: knuckleboom cranes—ranging in capacity from 2.5 to 140 metric tons, these units can be completely folded for efficient use of space; BL knuckleboom cranes—ranging in capacity from 24 to 400 metric tons, these knuckleboom units have a first long boom; telescoping boom cranes—available in capacities from 44 to 200 metric tons; and fixed length boom cranes—offered in capacities from 44 to 400 metric tons.

ELEVATING BOATS

Circle 74 on Reader Service Card

Elevating Boats, Inc. (EBI) has recently manufactured a number of its newly designed 100 and 150 Series marine cranes with capacities of 50 tons and 75 tons, respectively.

These cranes are offered in fixed, double-tapered box boom type and telescopic configuration that incorporates EBI's unique rack and pinion telescopic mechanism, which requires no internal hydraulic cylinder.

To reduce the cost of inventory and maintenance, most of the parts in the gearboxes for the swing mechanism of the crane are the same as the ones in the telescopic gearboxes and the load-line winch.

EBI has incorporated an all-hydraulic safety system with an anti-two-blocking device for it 100 and 150 Series cranes. This system protects the crane from an overload due to hoisting, booming out and telescoping out.

EBI has recently manufactured a TC150-54-100 model telescopic marine crane, with a 75-ton capacity and 54-foot retracted and 100-foot extended boom length, for the U.S. Maritime Administration. This crane was installed by Coastal Marine Services, Port Arthur, Texas, aboard the MA[7] Barbara Lois. The crane is currently in service for MarAd Beaumont Reserve Fleet. Its function is general equipment transfer and anchor-handling operation of up to 40,000 pounds at 40-foot reach.

HAGGLUNDS

Circle 75 on Reader Service Card

Hagglunds MTT, a Hagglunds company, is a world leading supplier of marine cargo cranes, as well as cargo crane technology. The latest development from the company is the Pallet Swinger, a crane specially designed to increase the productivity in the pallet-dominated reefer trade. The Pallet Swinger has already been installed on new reefer vessels being built by Boelwerf of Belgium for a Swedish company.

Hagglunds has always been successful in the reefer market, and in addition to the Boelwerf installations, a number of refrigerated cargo vessels currently being built by Polish yards for different owners, will be equipped with Hagglunds MTT MPL type cranes with SWL 30 and 8 tons.

Another new design introduced and delivered by Hagglunds Marine & Offshore is the four-rope

KC-crane, a heavy-duty grab crane specially designed for continuous operation for bulk material handling.

Other recent orders include cargo cranes for German-owned ships being delivered by the Alexandria Shipyard in Egypt and Greek-owned ships being built by the Varna Shipyard in Bulgaria.

For the offshore market, Hagglunds Kenz BV in the Netherlands has landed some major orders for the North Sea Oil Fields.

INTERCON

Circle 76 on Reader Service Card

Intercontinental Engineering-Manufacturing Corporation (Intercon) of Kansas City, provides engineering and heavy manufacturing services for the marine, defense, and heavy industrial markets. Intercoms reputation was established with heavy anchor handling, mooring, and towing winches, and, over the past decade, has expanded to include shipboard and land-based cranes.

Intercon has recently completed a contract for the Naval Facilities Engineering Command, Northern Division, Philadelphia, for two diesel/hydraulic portal cranes designed for weapons handling at Naval Weapons Stations in Yorktown, Va., and Charleston, S.C. The cranes are rated at 40 tons at 95 feet and 25 tons at 90 feet, respectively.

Current company military projects include fabrication and machining for a Navy Arleigh Burke Class destroyer, fabrication of Trident D5 hoists, and subcontract manufacturing of C VN deck machinery. Recent commercial deliveries include towing winches for Bisso Marine and Chevron, and line-handling equipment for Brix Maritime.

Intercon's full line of commercial and military deck machinery includes mooring systems, windlasses, capstans, towing and anchor handling winches, and heavy duty hose reel assemblies for pipe laying and underwater construction service. Intercon military and commercial cranes are available from 25 to 200 ton capacities.

JEAMAR WINCHES

Circle 103 on Reader Service Card

Jeamar Winches manufactures a complete line of heavy duty winches comprised of electric winches, hand winches, air winches, capstan winches and engine-powered winches.

All of these winches conform to either ANSI or DIN specifications and are designed for continuous heavy-duty applications.

All Jeamar winches are direct drive with no external chains, belts, or bull gears—completely automatic braking is standard. The whole range of Jeamar Winches are designed for high efficiency operation at lower operating costs.

KVAERNER EUREKA

Circle 98 on Reader Service Card

Kvaerner Eureka A/S is a leading supplier of all types of marine equipment, including a number of deck machinery and cargo-handling products.

For example, Kvaerner has engineered a series of hatch cover arrangements to meet all requirements for weatherdeck and tweendeck use.

For dry bulk cargoes, Kvaerner offers the cargo scooper, a versatile self-unloading and trimming system well-suited for efficient discharge in a wide range of ships. Discharge rates of up to 600 tons per hour from each hold simultaneously are possible, and lump sizes up to 100 mm can be handled.

Kvaerner Eureka is also a leader in the design and manufacture of ramps, doors, lifts and other types of cargo access equipment for the Roll-On/Roll-Off market.

In addition, Kvaerner also offers a wide range of gas-tight and watertight doors.

International shipowners involved in the transport offorest products, containers, and heavy rolling equipment, with vessels under construction in Europe, Japan and Korea, have installed many of these sophisticated Kvaerner Eureka systems.

LIEBHERR WERK

Circle 36 on Reader Service Card

Orders from around the world have been placed with Austrian manufacturer Liebherr-Werk Nen-

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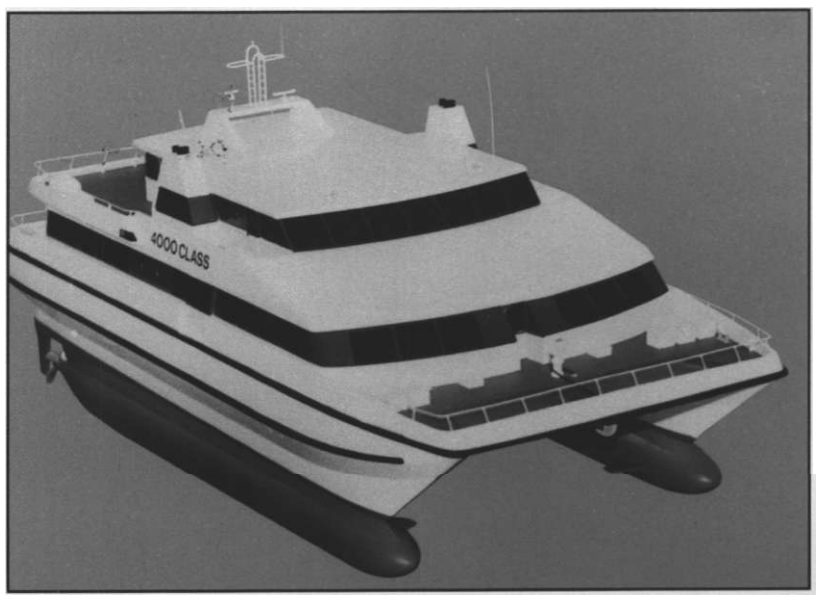
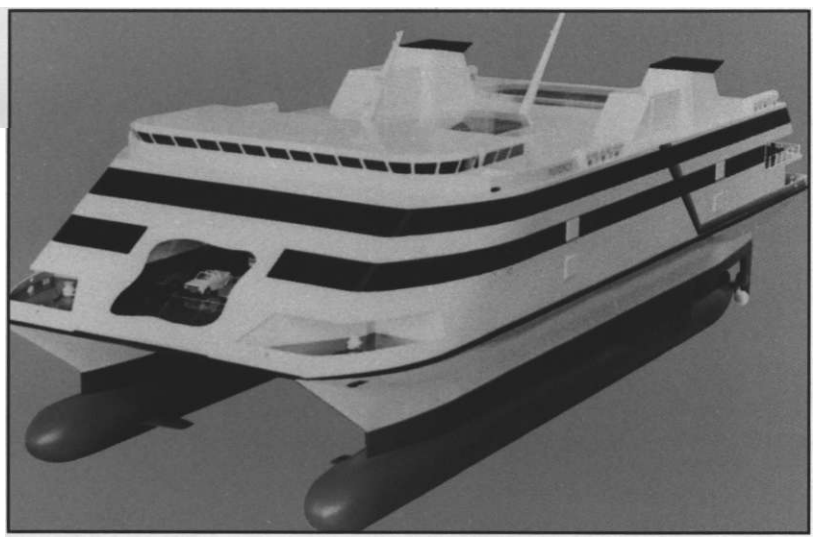


400 PASSENGERS • 35 KNOTS

Except for a few sheltered areas, calm water conditions do not prevail in the seas and oceans. Vessels must be judged in the real environment in which they work.

High speed ferries which are not swaths rapidly lose speed in seaways and expose passengers to a poor ride quality. It can be very risky economics just to assume acceptable ride quality will be there or to build a schedule around speeds not sustainable in real world conditions.

The swath hull form offers unparalleled ride quality and speed sustainability. Swath Ocean's experience with 7 launched swaths ranging from 22-3400 tonnes at full load and its database - incorporating a strong and thorough government backed 20 year R&D effort - permits excellent and realistic speeds in otherwise conservatively-designed quality ships. Only Swath Ocean can provide this optimum blend.



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Circle 283 on Reader Service Card

zing for its new low-profile, slimline CBW and CB Litronic deck cranes.

Four reefer vessels under construction in Denmark for United Brands and Geest Pic., for example, will feature a total of 12 deck cranes, comprising CBW 36/20 and D2 X CBW 20/20 Litronic models, which range in capacity from SWL 36 to SWL 20.

Other recent orders include: In Norway, eight CBW Litronic deck cranes, ranging in capacity from SWL 8 to SWL 36, will be installed on four Great White Fleet reefers; in Germany, two Great White Fleet reefers will each have two SWL 18-capacity CBW Litronic deck cranes; and in Australia, a vessel for Western Tug & Barge under construction in Tropical Reef Shipyard will feature an SWL 25-capacity CBW Litronic deck crane.

A recent order for four CB Litronic cranes, designed for fast container handling, have been placed by Regional Container Lines. The four model CB 40/32 container-handling cranes with capacities of SWL 40 will be installed on two reefers under construction in Korea.

Conforming with Quality System Standard ISO 9001, Liebherr manufactures ship, offshore and mobile harbor cranes.

LISTER

Circle 77 on Reader Service Card

Located near Bellingham, Wash., Lister Chain & Forge, Inc., occupies five acres of industrial land and a 16,000-square-foot concrete building.

With the chain making, heat treating and testing equipment supplied by ESAB AB, a subsidiary of the Swedish company ASEA, Lister Chain & Forge, Inc., is producing all sizes of marine anchor and mooring chain, from 3/4-inch to 3 inches in diameter. Additional equipment is also on site to increase the size range through 4-3/4-inch diameter.

Lister Chain & Forge, Inc., produces stud link anchor and mooring chain in accordance with military specifications and is recognized by many classification societies including the American Bureau of Shipping, Lloyds Register of Shipping, and the American Petroleum Institute.

MACGREGOR-NAVIRE

Circle 118 on Reader Service Card

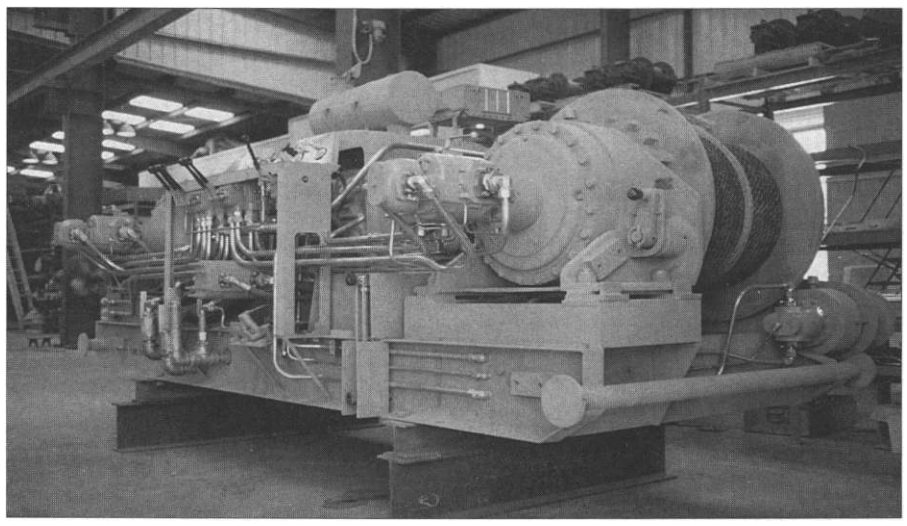
MacGregor-Navire is known throughout the maritime community as a principal designer/supplier of cargo access and internal interdeck transfer equipment. The company was involved in the early stages of development of LO/LO and RO/RO cargo-handling development.

MacGregor-Navire equipment continues to play a key role in the advancement of techniques for handling loading and discharge of shipborne cargoes.

The group's main products are hatch covers, RO/RO equipment, shipboard elevators and special cranes, and marine hydraulics; associated activities/products are cargo lashing systems, thermally insulated holds and covers for reefer vessels and consultancy services for shipping, shipbuilding and ports industries.

The group's crane/elevator division recently devised a number of new products, including: (a) an "A" frame; (b) a helicopter elevator; (c) two offshore deck cranes; and (d) a novel pilot hoist crane. All four of these systems have been installed onboard a multipurpose icebreaker under construction for the Finnish Board of Navigation.

Other developments include: a side access with automatic elevation, internal transfer and stowage system, for the coastal transportation of steel coils; and an auto maintenance platform which permits safe and easy access to a ship's external surface for cleaning, painting and repair.



McElroy Machine & Mfg. Co., Inc., Biloxi, Miss., has delivered 14 diesel-driven, double-drum hydraulic winches to the Navy.

MACOR Marine Systems

Circle 34 on Reader Service Card

Two reefer vessels currently being built for the Great White Fleet Ltd. at Schichau Seebeckwerft AG in Germany will be equipped with MACOR Marine Systems International GmbH deck equipment.

The hydraulically operated multi-folding hatch covers for the four holds of each 513-foot-long vessel were designed and delivered by MACOR Marine Systems International GmbH (formerly Deutsche MacGregor GmbH).

The 30- 1/2-foot-long and 25-foot-wide weatherdeck hatch of hold 1 on the forecastle deck is equipped with one folding pair stowing to fore-end. The other hatches, 41 feet long by 25 feet wide, on the upper deck of holds 2, 3, and 4 are provided with two folding pairs each, one stowing to fore- and one to aft-end. For elevator use, each hatch cover is fitted with an opening which is closed by a removable plate.

The three tweendecks are equipped with double-folding pairs, one of which stows to fore-end and one to aft-end. The tweendeck covers in hold 1 have only one folding pair stowing to fore-end.

In addition, MACOR delivered weathertight, non-insulated side doors for installation on each hold at the upper tweendeck level.

MANITOWOC

Circle 78 on Reader Service Card

Manitowoc Engineering Co., Manitowoc, Wise., Walter Wright Mammoet (S) Pte. Ltd., and Coastal Equipment Singapore Pte. Ltd., have jointly announced an initial order for two 1,200-metric-ton-capacity Manitowoc model M-1200R Ringer[R] cranes.

The model M-1200R is a recent innovation from Manitowoc, which combines a 600-foot Ringer attachment with an M-250, the flagship of its M-Series line.

The M-1200R provides nominal capacities of 750 and 1,200 metric tons. It also retains the M-Series philosophy of fast set-up and ease of transport, as the M-1200R attachment extensively relies upon Manitowoc's FACT™ (Fast Alignment Connection Technology) system and conforms with international road weight and dimension transport standards.

The M-1200R also includes modular counterweight and boom carriers plus Manitowoc's patented Ringer-Swingers[R] and various combinations of boom and mast to provide a 750-metric-ton capacity at 60-foot radius on 140-foot boom and 1,2000-metric-ton capacity at 60-foot radius on 150-foot boom.

MARINE TRAVELIFT

Circle 79 on Reader Service Card

A full range of hatch cover cranes from Marine Travelift, Sturgeon Bay, Wise., enable the removal and replacement of heavy hatch covers. From 15- to 60-ton capacities, the cranes are designed for the salt water service of bulk cargo vessels and oceangoing ships.

A completely self-contained unit, the hatch cover crane features centralized controls at the operator's station. The station is located for best visibility during travel and cover placement. The controls shift into neutral automatically for safety.

The Marine Travelift Hatch Cover Crane drives on all four wheels to assure traction and prevent yaw. Traveling on permanently mounted fixed rails, the main box girder is supported at each end by flanged wheel dollies. The unit's low height permits good visibility from the bridge, and clearance for shoreside obstructions.

Hatch covers are lifted with self-engaging hooks attached to lifting beams, which are raised or lowered by dual hydraulic cylinders. The hydraulic pump is driven by a diesel or waterproofed electric motor. Hydraulic motion control valves prevent overspeeding and provide smooth deceleration.

Unit dimensions and lifting capacities are adaptable to individual requirements.

MARKEY MACHINERY

Circle 37 on Reader Service Card

Seattle-based Markey Machinery Company, Inc., manufacturers of windlasses, capstans, mooring, towing and research winches, and special machinery, has delivered a number of new orders for several different types of vessels.

In the area of research equipment, a Markey Machinery scientific winch system has been installed on the icebreaker R/V Nathanial B. Palmer, operated by Edison Chouest Offshore, Inc., for Antarctica Support Associates. The package includes all instrumentation, controls, and power units needed for the operation of three research winches, DUSH-9-11, DUSH-5-5WF, and DUSH-5.

In addition, the NOAA's R/V Vickers, operated by the University of Southern California, was recently fitted with a DESH-5 research winch,which is controlled by local and remote stations, sized for 10,000 meters of 0.322-inch EM cable, and includes a two-speed gear train, levelwind, and removable drum.

Some of the latest workboat orders include a double drum towing winch installed onboard the M/V Barbara Bouchard, a Bouchard Transportation Company tug, and two WEWG-45 electric gypsy winches for the Crowley Maritime Corporation's M/V Point Milne and M/V Point Thompson.

Markey Machinery also delivered a CAW-60 air capstan to Yusuf Bin Ahmed Kanoo for use as a dockside capstan at the Saudi Arabian Oil Company's facility in Dhahran, Saudi Arabia.

MCELROY MACHINE

Circle 80 on Reader Service Card

McElroy Machine & Mfg. Co., Inc., Biloxi, Miss., has manufactured winches and other powered deck machinery for many marine applications. These include all branches of the U.S. military, as well as several foreign navies. Most recently, McElroy delivered 14 diesel-driven, double-drum hydraulic winches to the Navy for their side loadable

warping tugs project. The company has outfitted 35 U.S. Army landing craft with bow anchor windlasses and stern anchor winches, as well as five U.S. Army logistics support vessels with stern anchor winches. The Mississippi firm provided machinery to most types of commercial vessels including commercial fishing vessels, offshore supply boats, tugs, utility boats, ferries, research vessels, crewboats, landing craft, cruise vessels, and fire boats.

At present, McElroy is building the deck machinery for the U.S. Army Corps of Engineers dustpan dredge Hurley, as well as 12 capstans for U.S. Navy crane barges. Also in production are anchor windlasses, capstans, tuggers and stern rollers for the MSRC vessels currently being built on the Gulf Coast.

Established in 1915, McElroy offers a product range that covers small single drum mechanical winches weighing only 25 pounds, up to double drum diesel-driven winches weighing in excess of 50,000 pounds. Hydraulic, diesel and electric drive packages are also available on winches and other deck machinery.

MORGAN CRANE

Circle 81 on Reader Service Card

Morgan Crane Company, Inc., located in Santa Ana, Calif., now offers more than 90 different marine crane models, ranging in size from 1/2-ton to 100-ton capacity.

Morgan marine cranes are built to withstand any marine environment and can be ordered in knuckleboom, fixed or telescopic design. All cranes offer rack and pinion or continuous rotation slewing.

The Santa Ana-based company offers a complete line of standard or special marine crane applications and can be found throughout the commercial and military shipping industry.

Morgan marine cranes are used aboard the U.S. Navy AGOR-23 and TAGS-45, U.S. Army Corps of Engineers dredge Hurley, U.S. Coast Guard Polar Star and Polar Sea, and the Israeli Navy SA'AR 5 corvettes.

NEW ENGLAND TRAWLER EQUIPMENT

Circle 126 on Reader Service Card

New England Trawler Equipment Company recently delivered the fourth non-magnetic anchor windlass, Model X-1852 for the U.S. Navy's minehunter vessels (MHC). These special windlasses are constructed of5086 aluminum, stainless steel, bronze, and copper, and have an 8-inch main shaft of Aquamet 18. Four more of these custom-designed non-magnetic windlasses are currently in production in the company's Chelsea, Mass., facility.

Previously, NETEC built 14 identical, non-magnetic windlasses as the exclusive supplier for the Navy's MCM series ships.

Current projects under way or recently completed include: a 10-winch package with slewing and luffing winches, as well as positioning winches for a commercial floating mining/mineral processing facility in Florida; spud winches and capstans for Corps of Engineers barges; and capstans, windlasses and anchoring winches for commercial bulk carriers; and a Multiple Opening/ Closing Net Environment Survey System winch in under 10 weeks for the NOAA vessel Oregon II.

Later this year, the company will supply anchor winches for two major oceangoing OPA-compliant double-hulled tank barges.

New England Trawler Equipment Company designs and engineers all of its machinery specifically to meet its customers' needs, and manufactures to meet major classification society standards.

NORDIC

Circle 87 on Reader Service Card

Nordic Machine & Mfg., Seattle, Wash., is a company geared toward customer-specified projects. In addition to its line of anchor winches and hydraulic fishing equipment, Nordic is largely involved in designing and building custom hydraulic machinery.

Past projects have included hydraulic reservoirs and power units,

SMATCO Industries, Inc. is actively involved in the sales and manufacturing of SMATCO Winches, deck equipment, pneumatic tanks and bulk conveying systems for the Offshore Oil and Gas and Marine Industries. We also maintain a spare parts department and an ever ready crew of skilled service technicians. On 24 hour call.

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MODEL 66-DAW-200
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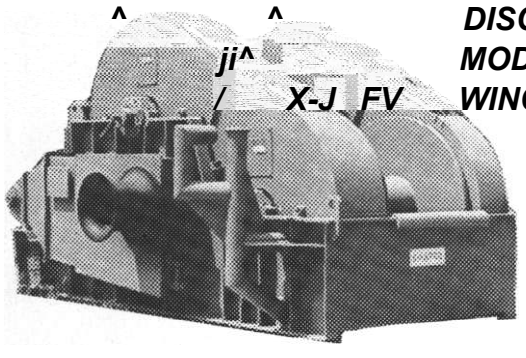

- *WINCHES*
- *RELATED DECK EQUIPMENT*
- *BULK TANKS AND CONVEYING SYSTEMS*

CHAIN WINDLASSES

CAPSTANS

Circle 260 on Reader Service Card

Introducing

SMATCO S NEWEST PRODUCT

Model CP-100F

SMATCO's new hydraulic quick release towing hook systems which consist of two quick release hooks each attached to a screw jacking mechanism which has 5 feet of travel. Ideally suited for notch barge applications where tension adjustments are necessary along with the ability to quickly release from the notches in emergency situations.

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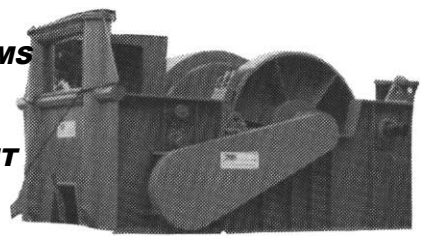

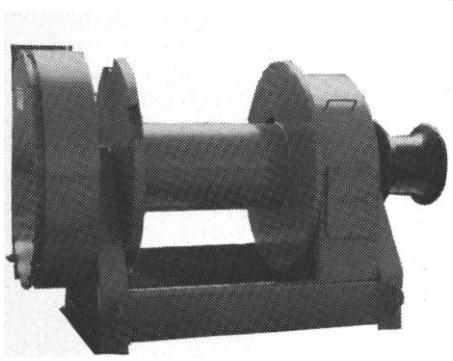

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NATIONAL	*BEEBE*
MARKEY	*MANY OTHERS*

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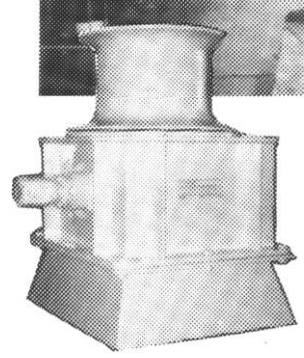

Interior View: CROSS EQUIPMENT'S Vast Remanufacturing Facility located in Southeast Louisiana

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head line and tow winches, capstans of all sizes and line pulls, and windlasses built to fit the customer's chain.

Nordic is capable of rebuilding an existing piece of machinery—from a simple repower to a total overhaul.

PETTIBONE TIFFIN

Circle 97 on Reader Service Card

Genuine factory authorized repair parts from Pettibone Tiffin Corporation, division of Pettibone Corporation, Tiffin, Ohio, maintain the high performance of Pettibone's original Marine Cranes, Truck Kranes, MultiKranes and Rough Terrain Hydraulic Cranes.

Engineered to the exact specifications as the original equipment, Pettibone Tiffin's repair parts provide repeatable high performance and maximum service life. Major parts and most often used items such as U-joints, pins, bushings, oil filters, fuel filters, seal kits, bearings, brake pads and hoses are available for immediate shipment, facilitating preventive maintenance and reducing possible downtime.

Pettibone repair parts are available from distributors located throughout the U.S.

RAMEY

Circle 86 on Reader Service Card

Winchester, Oregon-based Ramey Inc., offers pedestal electric stationary cranes. Capable of being mounted on a stationary or rotating platform in as little as five feet, Ramey marine cranes can be used aboard ships, barges or at dockside.

The company offers models ranging from fixed straight boom and optional telescopic extensions to two- or three-section knucklebooms. Lift capacities are offered from 2-1/2 to 37-1/2 ton.

In addition to offering a standard product line, Ramey custom engineers and builds equipment to meet customers' needs.

Ramey marine cranes are being used for a wide variety of applications, from cargo-handling to oyster dredging to Navy research vessels.

Fitted with optional custom-built grapples and attachments, Ramey marine cranes can be used for virtually any application.

SKOOKUM/ROPEMASTER

Circle 84 on Reader Service

Skookum/Ropemaster, Hubbard, Ore., a manufacturer of marine fairleads and tackle blocks has recently completed an order placed by Waterman Supply Company, Wilmington, Calif., for eight four-roller fairleads.

Weighing 3,700 pounds each, the 1-inch diameter roller fairleads are designed to be used with 1-3/4-inch diameter wire rope. With a tight delivery schedule, the fairleads were built and shipped in five weeks.

For over 100 years, Skookum/Ropemaster has built blocks, fairleads and related rigging hardware for marine, construction and other industries.

Aker Omega To Extend Its Joint SCBR Project

Aker Omega, Inc. has announced that it will be extending its Subsea Completed Buoyant Riser (SCBR) jointindustryproject. Phase 1, which was sponsored by seven major oil companies, was completed at the end of April. The seven companies were Amoco, Arco, BP, Marathon, Mobil, Statoil and Texaco.

The extension, Phase 1A, is scheduled to be finished by July 1992 and will further optimize the Gulf of Mexico design plus design an SCBR system for deep water areas off the West Coast of Africa.

The SCBR system can reportedly tie up to 20 individual buoyant risers together at a location well below the water surface. Individual flexible riser bundles extend upward from this location to a surface vessel. Reported major advantages of this system are: 1) made of proven components, 2) can be completely installed and removed by a standard drilling rig, 3) allows for the convenient servicing of wells, and 4) one riser at a time can be installed to bring wells into production as drilling progresses.

For further information,

Circle 22 on Reader Service Card

SMATCO

Circle 92 on Reader Service Card

Southern Machine and Tool Company (Smatco), established in 1948, offers a standard line of winches with models that range in size from 10,000-pound line pull to 1 million pound line pull. Over the years, the Houma, La., company has expanded its winch product line to include windlasses, capstans, tuggers, fairleaders, and deck sheaves. Specialty winches can be designed and built to suit a customer's specification.

In addition to the winch line of equipment, Smatco also designs and manufactures pipe-handling equipment, as well as bulk pneumatic conveying systems under the trade name "Pnu-Tank." The Pnu-Tank product line was designed to handle general dry bulk products on offshore supply vessels, drilling rigs, bulk storage plants and other bulk material transfer applications.

Smatco has a skilled crew of service technicians and parts specialists ready to maintain and service Smatco and other lines of marine-related equipment.

SMITH BERGER

Circle 88 on Reader Service Card

Smith Berger Marine, Inc., designers and manufacturers of wire rope and chain fairleads and deck sheaves, delivered equipment under several large contracts in 1991.

Eight of Smith Berger's patented underwater bending shoe fairleads for 5-inch wire rope as well as turn down rope guides have been delivered for use on a tension leg platform.

Twelve underwater fairleads for 90-mm K4 chain were recently delivered to Italy for installation on semisubmersible floating production facility. The fairleads featured seven pocket wildcats and were fully certified by Lloyd's Register of Shipping and the Registro Italiano Navale (RINA).

Soon to be delivered to Spain will be ten turret mounted underwater fairleads for 84-mm K4 chain to be installed on an FPSO vessel. Certified by Det norske Veritas, the fairleads have seven pocket wildcats, underwater bronze bearings, and have the ability to be lifted into place for installation with minimal assistance by divers.

Additionally, Smith Berger has continued to deliver their standard wire rope fairleads to the government and workboat industries. Recent shipments for the government include 3/4-inch wire rope fairleads to the U.S. Navy for use on their AOE vessels, mooring fairleads and hinged sheaves to the Corps of Engineers for the dustpan dredge Hurley, and oceanographic counterbalanced flagblocks to the U.S. Coast Guard for use on the Polar Class icebreakers based in Seattle, Wash. Smith Berger has completed another pair of tow pin/stern roller assemblies for Crowley Maritime Corporation and 12 sets of 2-inch wire rope fairleads and guide sheaves for McDermott Inc.

SUPERIOR-LIDGERWOOD-MUNDY

Circle 90 on Reader Service Card

For over 120 years, the combined companies of Superior-Lidgerwood-Mundy Corporation have produced and developed deck machinery and cargo-handling equipment for a wide variety of industries.

The first cableway manufactured in 1899 for the replenishment at sea of coal, ammunition, etc., was the Liderwood-Miller Marine Cableway. There have been many other notable company accomplishments, such as the 6,00 steam cargo winches and other equipment supplied during World War I, through the recently completed $4.5-million contract for 144 steam winches for the T-AO-143 Class oilers and current $12-million contract with NAVSEA for state-of-the-art UNREP winches.

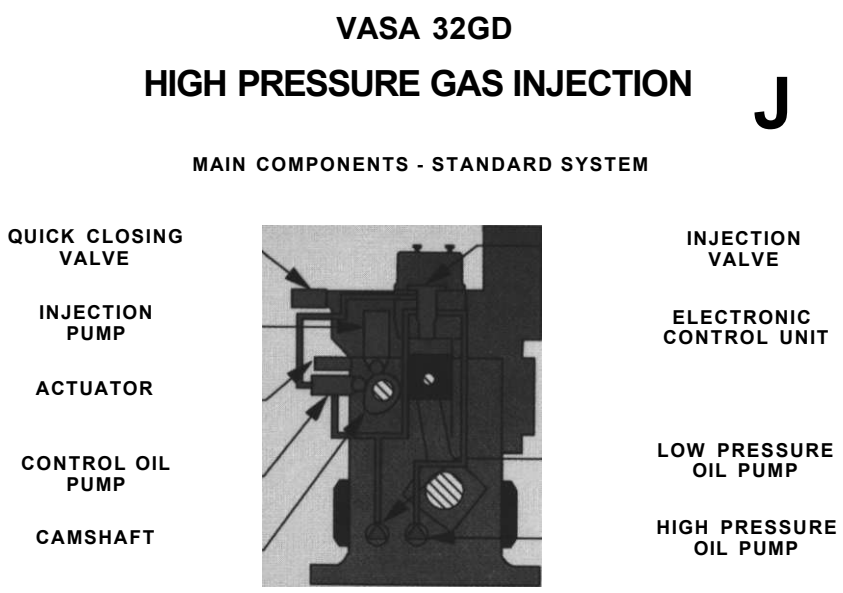
Superior-Lidgerwood-Mundy reports that utilizing steam winches can reduce costs.

Current company orders include: two gypsy winches for the Navy; 21 station-keeping aids for the NSWSES; two double-drum winches for the U.S. Army Corps of Engineers; four capstans for both Bath Iron Works and Ingalls Shipbuilding; a topping winch for the Supervisor of Shipbuilding, Portsmouth, Va.; and 44 FFG pumps and two FFG capstans for China Ship.

TSE INTERNATIONAL

Circle 93 on Reader Service Card

T.S.E. International, Shreveport, La., a subsidiary of Timberland Equipment Ltd., Woodstock, Ontario, Canada, has supplied three linear cable engines to the U.S. Navy. The machines were used to install underwater fiberoptic cable for a sonar array system for an Antisubmarine Warfare testing facility off the coast of San Clemente Island, Calif. The equipment can automatically handle cable up to 5 inches in diameter, with in-line repeaters up to 14 inches in diameter and at speeds up to 4 knots with a combined line pull capacity of up to 18,000 pounds.



The main components of the Wartsila Vasa 32 Gas-Diesel technology package.

Wartsila's Vasa 32 Gas Diesel Now Ready For Global Sales

Wartsila Diesel has recently released its new Vasa Gas Diesel (GD) 32 for international sale.

Following Wartsila's traditional marketing philosophy, the company gained experience on the engine by first selling a few pilot installations to selected customers for testing.

The idea is based on the assumption that the diesel process can be used to burn any hydrocarbon if the conditions are right. The conventional diesel process anticipates that the combustible is introduced at the end of the compression stroke, which means in a gas diesel that the gas must be introduced at high pressure. The advantage of the diesel process for the gas-burning engine is that the same thermal efficiency can be achieved as with an oil-burning diesel engine, resulting in an equal power weight ratio for both types of engines.

Another benefit is that different kinds of fuel can be used. In the case of the Wartsila Vasa 32 GD, heavy fuel, distillate oil or natural gas are useable.

While developing the Vasa 32 GD, Wartsila first had to confirm that achieving an acceptable combustion process with the most common gas, i.e. natural gas, would be possible. By using experimental injection equipment, the company was able to demonstrate the feasibility of burning gas in both a combustion cell and in a real diesel engine cylinder.

Wartsila next had to design and develop the industrial equipment that would be able to perform in a diesel engine for thousands of hours of operation. The company tested three different types of engines, after having encountered some difficulty in achieving high thermal efficiency over a wide load range, long equipment lifetime, reliable operation and smooth switch-over from fuel to fuel. By using some of their pilot installations, the company was able to perfect the engine's gas injection equipment.

At the point in engine development that a plant with 3 by 18 cylinders approached 98 percent thermal efficiency on a regular basis, Wartsila decided that the Vasa 32 GD was ready for full production.

The key component in the engine is the injection valve, which provides concentric injection of gas and pilot fuel. Gas injection is controlled by a control oil pump driven by the engine camshaft. While it can also be used as the normal lubricating pump, a low pressure oil pump acts as the feed pump to the control oil pump, while the high pressure pump supplies sealing oil to the gas injector.

Wartsila uses an electronic speed regulation system to separate actuators for gas and diesel oil. To ensure that no malfunctions of the gas injection valve lead to engine cylinder over pressure, a quick-closing valve has been fitted. To provide maximum accuracy of the injected amount of pilot fuel at low injection volumes, a special injection pump is provided.

The Wartsila pilot installation with the most running hours had 8000 hours per engine at the time of product release. Experience indicates that the lifetime of the gas nozzle seems to be at least equal to the normal lifetime of a diesel nozzle, an acceptable operational reliability.

Operational testing also showed that the gas-diesel engine produces 50 percent less NO exhaust emissions than a conventional diesel optimized for emission control. Wartsila claims that it may be possible to lower the Vasa 32 GD's emission levels even more. In light of increasingly stringent international air pollution requirements, this is likely to count significantly in gas-diesel technology's favor.

A solid understanding of how the engine's cylinder and control system react at different loads demanded an extensive series of bomb tests, large text matrixes for nozzle hole configuration, measurement and calculation of heat release, mathematical simulation of the combustion as well as simulation of control functions.

The experience gained by Wartsila Diesel from the Vasa 32 GD is considerable and the company is fully prepared to continue the development of gas technology applications.

For free literature regarding Wartsila's Vasa 32 Gas-Diesel engine,

Circle 48 on Reader Service Card

U.S.S. Anzio (CG 68) underway in the Gulf of Mexico during predelivery sea trials. CG 68 will be joining the U.S. Atlantic fleet in May.

USS Anzio, Ingall's 15th Aegis Cruiser Completed

The Navy's 22nd Aegis guided missile cruiser, the U.S.S. Anzio, CG 68, is scheduled to be commissioned into the Atlantic fleet at the Norfolk Naval Station, Norfolk, Virginia this month. Captain **H. Wyman Howard, Jr.,** USN, will be accepting command of the ship, with Lieut. Comdr. **Kevin** S. **Amos,** USN, as her executive officer. The U.S.S. Anzio is the second Navy ship to commemorate the World War II Allied landing at the Anzio/Nettuno area on Italy's west coast, on January 22, 1944.

Admiral **David E. Jeremiah,** USN, Vice Chairman of the Joint Chiefs of Staff, will deliver the principle commissioning address. Vice Adm. **Joseph P. Reason,** USN, Commander, Naval Surface Force, U.S. Atlantic Fleet, will place the new ship in commission.

Other speakers in the ceremony include **Owen P. Pickett** (Rep-Virginia); Admiral **Paul D. Miller,** USN, Commander-in-Chief U.S. Atlantic Fleet; Vice Adm. **Robert K. U. Kihune,** USN, Assistant Chief of Naval Operations, Surface Warfare; and **Jerry St. Pe',** senior vice president of Litton and president of Ingalls Shipbuilding. **Doris Baggett,** wife of Admiral **Lee Baggett,** Jr., USN Retired, serves as U.S.S. Anzio's sponsor, and christened CG 68 at Ingalls on November 10,1990.

The U.S.S. Anzio is the 15th of 19 Ticonderoga Class cruisers ordered by the Navy from the Ingalls Shipbuilding division of Litton in Pascagoula, Miss. Ingalls is also building DDG 51 Class Aegis guided missile destroyers, with 10 ships under contract, and LHD amphibious assault ships, with 4 ships in production.

For additional information regarding the facilities and services available at Ingalls Shipbuilding,

Circle 133 on Reader Service Card

U.S.S. ANZIO
Equipment List

Propulsion Gas Turbines	GE
Reduction gear	Westinghouse
Generators	Stewart & Stevenson
C.P. Propellers	Bird-Johnson
Ship Control System, Radio Equipment, Damage & Fuel Control Consoles	Litton
SPS 49 radar	Raytheon
400-hz/Degaussing power supply	MagneTek
Waste Heat Boiler	Combustion Engineering
Shaft Bearings	American Metal Bearing
Distilling Plants	Aqua-Chem
HVAC	York International
L.P. Air Compressors	Worthington Compressors
Fan Coil Assembly	Mario Coil
Steering Gears	Jered Brown Bros.
F.0. & L.0. Pumps	Warren Pumps
Ventilation, Turbine & Generator Cooling Fans	Joy Manufacturing
Duplex Strainers	Chas. M. Bailey
Control Valves	Cla Val
Gauges	Weksler Instruments
Electrical Symbol Items	Henschel
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Circle 208 on Reader Service Card

ie Shipbuilders of pain

The 232-foot by 45-foot M/V Star of Honolulu, recently delivered by the Whidbey Island yard of Nichols Brothers Boat Builders, will operate in Hawaiian dinner cruise service.

Nichols Brothers Delivers 1,600-Passenger Dinner Boat For Hawaiian Service

Largest Vessel Delivered To Date By Washington Yard

The 232-foot, 1,600-passenger M/V Star of Honolulu, the largest, heaviest vessel ever built by Nichols Brothers Boat Builders, was recently delivered by the firm's Whidbey Island, Wash., yard to operator, Paradise Cruise Ltd., of Honolulu, which is expected to homeport the vessel at Kewalo Basin, or Honolulu Harbor.

According to Capt. **Reg White,** director of operations for the Honolulu fleet, the Star of Honolulu will circumnavigate Oahu during daylight hours and offer sunset dinner cruises.

Equipped with a watts type stabilizer and a deep-vee hull for a smooth ride, the Nichols Brothers-designed dinner/excursion boat weighed about 950 tons at her launching. According to **Archie Nichols,** vice president of engineering for the boatbuilder, she is the heaviest load ever transported by Nichols Brothers' steel cradle and hydraulic track system.

Weighing 1,166 tons fully outfitted, the Star of Honolulu has a power plant consisting of two Caterpillar 399, 1,125-hp engines, driving Cat 7261, 3.18:1 reduction gears. Power is transferred to 48-inch by 60-inch Sound Propeller wheels via 5-inch Aquamet shafts. She will have a full load speed of 11 knots. Mathers supplied MMW electronic propulsion controls. Nichols engineered the steering system and alarm monitors. AnS-103LSchottel Werft steerable bow thruster not only aids in docking, but can also be used to bring the vessel home, if needed.

Auxiliary power for the vessel is supplied by two Cat 3406 165-kw diesel generators. The interiors of the vessel were designed by Interior Design International of Seattle. For dinner service, the vessel can accommodate 550 passengers on the main deck for a "Star Sunset Dinner Cruise." About the same number of passengers can be handled on the second deck, which is open for private charter.

The third deck is designated for the 350-passenger "Three-Star Sunset Dinner Cruise," while the enclosed top deck allows 80 passengers to be accommodated for "Five-Star Sunset Dinner Cruise."

For free literature detailing the boatbuilding and vessel repair services of Nichols Brothers Boat Builders,

Circle 19 on Reader Service Card

STAR OF HONOLULU
Equipment List

Main engines (2)	Caterpillar
Rudder stocks, shafts	Aquamet
Propellers	Sound Propeller
Propulsion controls	Mathers Controls
Bow thruster	Schottel Werft
Alarm monitor, steering system	Nichols Bros.
Manual steering	Wagner
Generators	Caterpillar
Paint	Hempel
Electrical wires, lights & breakers	Hardware Specialties
HVAC	Celsius Marine
Elevators	Associated Elevator
VHF radio/telephone, ham radio station	Kenwood Electronics
Radar, video depth sounder	Furuno
Autopilot	Robertson
Single sideband	SEA
Satnav	Magellan

Shell Imposes Insurance Requirements On Tanker Charter Contracts

Shell International Marine Ltd. recently announced that it will impose an insurance clause in its tanker charter contracts. The new clause requires owners to prove that their tankers are insured by a well-known insurance company rather than being self-insured.

This action is being taken as a precautionary measure and also to ensure Shell's policy of chartering only "quality" tonnage.

ABB Supplies Systems For New Icebreaker Being Built By Finnyards

The Finnish Board of Navigation (FBN) recently ordered a new multipurpose icebreaker from Finnyards, the shipbuilding company formed by Rauma Yards and Hollming. The vessel will be used for icebreaking in the winter and will be chartered to Ugland Offshore A/S of Norway during the summer for duties in the North Sea oil and gas fields. The vessel, valued at about $135 million, is scheduled to be delivered in March 1993.

Asea Brown Boveri Marine (ABB), Helinski, is providing the diesel-electric propulsion system for the icebreaker. ABB's cycloconverter system will be installed aboard the vessel to drive two Aquamaster-Rauma Z-drives (fixed-pitch propellers). Power for the entire plant will be provided by four Wartsila Vasa 32 diesel engines and ABB Marine alternators will supply AC power to the whole vessel.

The vessel was designed to accommodate the offshore operational needs of Ugland Offshore as well as icebreaking capabilities. It will have a speed of eight knots in 2.6-feet of Baltic ice and is designed to operate in Arctic ice up to 5.9 feet thick. This vessel will replace two of the oldest icebreakers operating in the Baltic, the Tarmo and Hanse. These two vessels are now almost 30 years old.

For more information about ABB Marine's propulsion systems,

Circle 4 on Reader Service Card

For more information about the services and facilities of Finnyards,

Circle 5 on Reader Service Card

Caterpillar-powered R/V Nathaniel B. Palmer, built by North American Shipbuilding, Larose, La., is reportedly the nation's first commercial icebreaking research ship.

First Commercial Icebreaking Research Ship Delivered By North American

The culmination of two years of construction, the R/V Nathaniel B. Palmer emerged from the Larose, La., shipyard of North American Shipbuilding as the nation's first commercial icebreaking research ship.

Able to break ice three feet thick at a speed of three knots, the pioneering 308-foot vessel is operated under the direction of Antarctic Support Associates (ASA), a joint venture of Holmes & Narver, Services, Inc., Orange, Calif., and EG&G, Inc., Wellesley, Mass., for the National Science Foundation (NSF) U.S. Antarctic Program. Developed for the express purpose of supporting research in Antarctica, the Palmer is owned by Edison Chouest Offshore, Galliano, La., the parent company of North American Shipbuilding.

The Port of South Louisiana activated Foreign Trade Zone #124-B, a subzone of the port's main zone, for North American Shipbuilding to help the shipyard meet the specifications of international shipbuilding contracts and still maintain competitive pricing.

Ice classed to new ABS rules, ABS A-2, the Palmer can navigate rough open seas, rolling less than 8 degrees in 16-foot waves and can accommodate 37 scientists and 26 crew.

The 6,500-long ton ship's maiden assignment involves the rotation of scientists from a mile long ice floe where the first Russian-American ice station was launched in mid-February in Antarctica's Weddell Sea. The Ice Cap '92 project is gathering data on global climate and ocean currents that are key to determining the effects of global warming. Included in the Palmer's sophisticated electronics suite is Robertson's Disc Navigation System, an Electronic Charts Display and Information System (ECDIS). It is a real-time geographic information system that combines both spatial and text data to continuously determine the vessel's position in relation to land, charted or observed objects, glaciers, or ice packs, and unseen hazards, providing the vessel with an extra margin of safety.

The Palmer's ECDIS will also output position data to the Robertson Dynamic Positioning System which will allow the Palmer to negotiate into and out of, or through areas that require special low-speed maneuvering. The Robertson RMP ROBPOS permits the operator joystick control of all engines, propellers, thrusters and rudder.

Robertson also supplied its MSS400 steering controls for operation of the vessel's two high-lift, independently controlled rudders.

Main propulsion for the Palmer is provided by four Caterpillar 3608 diesels, rated at 3.180 bhp each at 1,000 rpm, with two nozzled Ulstein stainless steel, controllable-pitch four-blade propellers.

Four Caterpillar/KATO 3512 gensets, rated at 1,070 kw each, supply ship service power.

Two Ulstein 1,500-hp direct drive diesel bow thrusters and one 800-hp tunnel stern thruster are installed for maneuverability.

For free literature detailing the ship construction services of North American Shipbuilding,

Circle 56 on Reader Service Card

NATHANIEL B. PALMER
Equipment List

Main engines (4)	Caterpillar
CP propellers	Ulstein
Generators	KAT0
Generator engines .	Caterpillar
Bow thrusters	Ulstein
Stern thruster	Ulstein
DP system	Robertson
ECDIS	Robertson
Research winches...	Markey Machinery
Steering controls ...	Robertson
Refrigerator doors	Cospolich

BUYERS DIRECTORY

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

ABRASIVES
Barton Mines Corp., 1658 Cole Blvd., Golden, CO 89401
Bourg Drydock, P.O.Box 1852, Houmo, LA 70361
Chesapeake Specially Products, 5055 Northpoint Blvd., Baltimore, MD 21219
Ervin Industries, Inc., 3893 Research Park Drive, P.O. Box Il 68, Ann Arbor, MI 48106-1668

AIR CONDITIONING AND REFRIGERATION—Repair & Installation
Bailey Group, 2323 Randolph Ave., Avenel, NJ 07001
Carrier Tronsicold, P.O. Box 4805, Syracuse, NY 132211
Maritime Services Corp., 3457 Guignard Drive, Hood River, OR 97031
Stal Refrigeration AB, Butangsgatan 16, S-601 87 Norrkoping, SWEDEN
York Int'l, P.O. Box 1592-083G, York, PA 17405

BALLAST
Chesapeake Specialty Products, 5055 Northpoint Blvd., Baltimore, MD 21219
Genstor Stone Products, Executive Ploza 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
Maxon, South Boundary Street, P.O. Box 69, Tell City, IN 47586

BARGE COVERS
Syntechnics Inc., FRP div. 700 Terrace Lane, Paducah, KY 42003

BARGE—Leasing
McDonough Marine Service, 2300 Surekote Road, New Orleans, LA 70117
Zidell Explorations, Inc., 3121 SW Moody Ave., Portland OR 97201

BASKET STRAINERS
Beoird 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
Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Orkot Engineering, 2535 Proirie Road-Unit D, Eugene, OR 97402
Thomson Gordon Ltd., 3225 Mainway, Burlington, Ont., CANADA L7M1A6
Waukesha Bearings, P. 0. Box 1616, Woukesho, WI 53187-1616

BOILER—Manufacturers
Aalborg Ciserv (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,
2900 Energy Centre, 1100 Poydros Street, New Orleans, LA 70163-2900
Diversified Marine Brokerage, 1201 Northern Blvd., Manhasset, NY 11030
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

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

CABLE ASSEMBLIES
Revere Aerospace, 845 N. Colony Rd. Wallingford, CT 06492

CARGO ACCESSORIES
Morgan Crane Company, Inc., 1300 Normandy Place, Santa Ana, CA 92705

CHAIN
Baldt, Inc., 6 M. Butler St., Chester, PA 19013
Crondall Dry Dock Engineers Inc./Morit Chain, 21 Pottery Lane, Dedham MA 02026
Milligan Marine Supply Inc., 5832 Harvey Wilson, Houston TX 77020
G.J. Wortelboer Jr. B.V., Postbus 5003, 3008 AA Rotterdam, NETHERLANDS

CLAMPING—Pipe, Tubes, Hose
ZSl, 32497 ScnoolcraH Road, Livonia, MI 48150

CLASSIFICATON SOCIETY
American Bureau of Shipping, 2 World Trade Senter, 106th Floor, 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, USA

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

COMPUTERIZED INFORMATION SYSTEMS
Coastdesign, Inc., Unit 201,12837 76tti Avenue, Surrey, BC CANADA V3W 2V3
Intergraph Corp., 2051 Mercator Dr., Reston, VA 22091-3413
Micronautics Inc. P.O. Box 1017, Rockport, ME 04856
TIMSC0, P. 0. Box 91360, Mobile AL 36691

CONDENSERS/SEPARATORS
Beaird 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
Autronica Marine A/S, Drammensveien 126, N-0277 Olso 2, NORWAY
Henschel, Inc., 9 Hoyt Drive, Newburyport MA 01950
IMO Industries, Gems Sensors Division, One Cowles Rd., Plainville CT 06062
Lyngso-Valmet Marine A/S, P.O. Box 130, N-3430 Spikkestod, NORWAY
MMC International, 60 Inip Dr, Inwood NY 11696
Marine Electric RPD, Inc., 50 Carol St., P.O. Box 1135, Clifton, NJ 07014-1135
Norcontrol A/S, P.O. Box 1024, N-3191 Horten, NORWAY
Robertson Marine Systems, 3000 Kingman St., Suite 207, Metairie, LA 70006
Row Technology, P.O. Box 265, Littlestown, PA17340
Teleflex Inc., 771 First Ave, King of Prussia, PA 19406

COUPLINGS
Lo-Rez Vibration Control Ltd., 156 West 8th Avenue, Voncouver, BC CANADA, V5Y 1N2

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. Headquarters, 50 Chestnut Ridge Rood, Montavale, NJ 07645
Liebherr-Werk Nenzing GES.mbh, P.O. Box 10, A-6710 Nenzing, AUSTRIA
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
Morgan Crane Company, Inc., 1300 Normandy Place, Santa Ana, CA 92705
J.O. Neuhaus Hebezeugue 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
Westmont Inds, 10805 Painter Ave, Santa Fe Springs, CA 90670
Zidell Explorations, Inc., 3121 SW Moody Ave, Portland OR 97201

DECK MACHINERY—Cargo Handling Equipment
Braden Carco Gearmatic, P.O. Box 547, Broken Arrow, OK 74013
New England Trawler Equipment Co, 291 Eastern Avenue, Chelsea, MA 02150
Markey Machinery Co, Inc, P.O. Box 24788, Seattle, WA 98124-0788
Morgan Crone Company, Inc, 1300 Normandy Place, Santa Ana, CA 92705
McElroy Machine & Mfg. Co, Inc, P.O. Box 4454, Biloxi MS 39535-4454
Skookum/Rope Master,P.O. Box 280,Hubbard, OR 97032
Willem Pot b.v, P. 0. 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
Nordic mochine Mfg, 4700 Balard Ave, NW, Seattle, WA 98107

DIESEL ACCESSORIES
Coltec Industries Fairbanks Morse Engine Div. 701 Lowton Ave, Beloit, WI 5351 1
Gearhardt's Inc, P.O. Box 10161, Jefferson, LA 70181
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, MA 02360
Giro-Engineering Ltd, 370 Brook Lane, Sarisbury Hampshire, ENGLAND S03 6ZA
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
Aolborg Ciserv (Miami) Inc, 1539 SW 21st Avenue, Ft. Lauderdale, FL 33312
Caltax Marine Diesel B.V, Frankijkweg 11, 4455 TR Nieuwdorp (Vlissingen Oost), THE NETHERLANDS
Caterpillar, Inc, Engine Div, P.O. Box 610, Mossville, IL 61552-0610
Coltec Industries, Parts & Service Div, 701 Lawton Ave, Beloit, WI 53511
Cummins Engine Company, Mail Code 60011, Box 3005, Columbus, IN 47202-3005
John Deere, John Deere Rood, Moline, IL 61265
Global Maritime Services, 247 SW 33 Court, Ft. . Lauderdale, FL 33315
Golten Marine Company Inc, 160 Van Brunt Street, Brooklyn, NY 11231
Hatch & Kirk, 5111 Leary Avenue NW, Seattle, WA 98107
Kim Hotstort Mfg Co, E 5724 Broadway Ave, P.O. Box 42, Spokane WA 99210
MAN B&W Diesel GmbH, Stadtbachstrasse 1, D 8900 Augsburg 1, GERMANY
MAN BSW Diesel, 17 Stote. Street, New York, NY 10004
MTU of North Americo, 10450 Corporate Drive, Houston, TX 77478
Markisches Werk GmbH, P.O. Box 1442,0-5884 Halver 1, GERMANY
National Maintenance X Repair, Foot of Hawthorne, Hartford, IL 62048
New Sulzer Bros, Inc, 200 Park Ave, New York, NY 10166
Pacific Rim Diesel, 3842 W. Marginal Way SW, Seattle, WA 98106
Paxman Diesels, P.O. Box 8, Paxman Works, Colchester, Essex, C01 2HW, ENGLAND;
Paxman Diesels USA, (A Div. of Ruston Gas Turbines, Inc.), 15950 Park Row, Houston, TX 77084

DIVING & SALVAGE
Bisso Marine Co. P.O. Box 4113, New Orleans, LA 70178
H.J. Merrihue, P.O. Box 23123, New Orleans LA 70183
Muldoon Marine Services, Inc, P.O. Box 3221, Terminal Island, CA 90731
Sea-Side Diving, 28612 Harper Ave, St. Clair Shores, MI 48081

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), P0 Box 3012, Curacao, Netherlands Antilles
Ferrostaal AG, D-4300 Essn, Hohenzollernstrasse 24,GERMANY
Marine Design Services, P.O. Box 928, Bonito CA 92002

ELECTRICAL EQUIPMENT
Bender Inc, 400 Gordon Or, Bldg 501, Exton, PA 19341
L F. Goubert 8 Co, Inc, P. 0. Box 50500, New Orleans U 70150
MMC International, 60 Inip Dr, Inwood NY 11696
Row Technology, P.O. Box 265, Littlestown, PA17340
SP0 Technologies, 13500 Roosevelt Blvd., Philadelphia PA 19116
Universal Marine Electric Co, Inc, P.O. Box 266-923, Houston, TX 77027-6923

ELECTRONIC DISPLAY
Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolboton, NORWAY

ELECTRONIC ENCLOSURES
A8J Manufacturing, 14131 Franklin Ave, Tustin CA 92680

ELECTRONIC INFORMATION SUPPORT
Inventory Locator Service, 3965 Mendenhall Rd. South, Suite 10, Memphis, TN 83115
Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolboton, NORWAY

ENGINE TEST EQUIPMENT
Amot Controls, PO Box 1312, Richmond, CA 94802
General Thermodynamics Corp, P.O. Box 1105,210 S. Meadow Rood, 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
Koden International, 77 Accord Park Drive, Norwell, MA 02061

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-Lavol Separation, Inc, 955 Meorns Rd, Warminster, PA 18974
Aqua-Chem, Water Technologies Div, P.O. Box 421, Milwaukee, WI 53201
Beoird Industries Inc, P.O. Box 31115, Shreveport, LA 71130

FANS-VENTILATORS-BLOWERS
Corling Turbine Blower Co, 10 Nebraska St, P.O. Box 88, Worcester, MA 01613
Jon M. Liss Associates, Inc., 411 Borel Ave, San Mateo, CA 94402

FASTENERS
Jamestown Distributors, 28 Narragansett Ave, P.O. Box 348, Jamestown, RI 02635

FENDERING SYSTEMS/BUOYS-Dock & Vessel
Kohlenberg Bros. Co, P.O. Box 358, Two Rivers, WI 54241
Milligan Marine Supply Inc, 5832 Harvey Wilson, Houston, TX 77020
Rowe Bumpers, Conveyors & Caster Corp, 3501 Detroit Ave, Cleveland, OH 44113
Seaward International, Inc, Cleorbrook Industrial Park, P.O. Box 98, Cleorbrook, VA 22624
Solidur Plastics Co, 200 Industrial Dr, Delmont, PA 15626
Standard Refrigeration Co, 2050 N. Ruby, Melrose Pork, IL 60160
Ultra Poly Inc, 2926 South Steele, Tocoma, WA 98409
Viking Fender Co, 50 Church Street, Seo Bright, NJ 07760

FIBERGLASS GRATING
International Grating, Inc, 7625 Parkhurst, Houston, TX 77028

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

FRICTION COMPONENTS/PARTS
Champion Friction Co. 845 McKinley St, Eugene, OR 97440

FUEL ADDITIVES, CONDITIONING
Hammonds Fuel Additives, PO Box 38114-407, Houston, TX 77238-8114

GALLEY EQUIPMENT
Cospolich Refrigerator Co, 949 Industry Rd, Kenner LA 70062
Forma Kool, 28245 Kehrig St, Mt Clemens, MI 48045
Gaylord Industries, 10900 S W Avery St, P.O. Box 1149, Tualatin, OR 9Z062

GANGWAYS, LADDERS
Coast Marine & Industrial Supply Inc, 398 Jefferson St, San Francisco, CA 94133
Wooster Products Inc, 1000 Spruce St, P.O. Box 896, Wooster, OH 44691

HEAT EXCHANGERS
Alfa-Lavol Separation Inc, 955 Meorns Rd, Warminster, PA 18974
Beaird Industries Inc, P.O. Box 31115, Shreveport LA 71130
Tranter Inc, Old Burk Road, Wichita Falls, TX 76307

HORNS/WHISTLES
Kohlenberg Bros Co, P.O. Box 358, Two Rivers, WI 54241

HYDRAULICS
Aeroquip Corporation, 3000 Stroyer, P.O. Box 631, Maumee, OH 43537-0631
Cunningham Marine Hydraulics Co, 201 Harrison St, Hoboken NJ 07030
Del Gavio Marine Hydraulics Inc, 619 Industrial Rd, Carlstadt, NJ 07072

INCINERATORS
A/S Vesta, 27 Skudehavnsvej, DK-2100 Copenhagen DENMARK. US Agent: American

INSULATION
Soundcoat Company, 1 Burt Drive, Deer Park, NY 11729

JET PROPULSION SYSTEMS
North American Marine Jet, P.O. Box 1232, Benton, AR 72015

JOINER—Watertight Door—Paneling—Ceiling System—Decking
GEC-Morconi Electronic Systems Corp, 550 S. Fulton Ave, Mt. Vernon, NJ 10550
IMAC AB, Berga Alle 1, S-252 55 Helsingborg, SWEDEN
U.S. Rep: Hopeman Brothers, Inc, P.O. Box 820, Waynesboro, VA 22980
Jamestown Metal Marine Sales, Inc, 4710 Northwest Second Avenue, Boca Raton, FL 33431
Marine Accommodations Inc, 8535-3 Baymeadows Rood, Suite 140, Jacksonville, FL 32256
Maritime Services Corp, 3457 Guignard Drive, Hood River, OR 97031

KEEL COOLERS
R.W. Fernstrum & Co, 1716 Eleventh Ave, Menominee, MI 49858
Kohlenberg Bros. Co, P.O. Box 358, Two Rivers, WI 54241
The Walter Machine Co, Inc, 84-98 Cambridge Avenue, Jersey City, NJ 07307

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

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
ACR Electronics, Inc, 5757 Ravenswood Rd, P.O. Box 5247, Ft. Lauderdale, FL 33310-5247
Archway Marine Lighting, 4501 Swan Ave, St. Louis, M0 63110
Carlisle & Finch, 4562 W. Mitchell Ave, Cincinnati OH 45232
The L.C. Doane Co, P.O. Box 975, Essex, CT 06426
Nautilus Equipment Ltd, P.O. Box 66, Station M, Halifax, Novo Scotia B3J 2L4, CANADA
Phoenix Products, 6161 N 64th St, Milwaukee WI 53218

LINE BLINDS
American Piping Products, Inc, 22 S. 9th St, New Hyde Park, NY 11040
Stacey/Fetterolf, P.O. Box 103, Skippock, PA 19474

LIQUID OVERFILL PROTECTION SYSTEMS
E.R.L. Marine Products, P.O.Box 1026, New Albany, IN 47151-1026

LOGISTICS
VL Logistics Consultants, Inc, 3420 Bienville Blvd., Ocean Springs MS 39564
QED, 4646 N. Witchduck Road, Virginia Beach, VA 23455

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
Del Gavio, 619 Industrial Rd, Carlstadt, NJ 07072
Global Maritime Services, 247 SW 33 Court, Ft. Lauderdale, FL 33315
Golten Marine Company Inc, 160 Von Brunt Street, Brooklyn, NY 11231
New England Trawler Equipment Co, 291 Eastern Avenue, Chelsea, MA 02150

MACHINING—On Site Repair
Global Maritime Services, 247 SW 33 Court, Ft. Lauderdale, FL 33315

MARINE ACCOMMODATIONS
Directions in Design Inc, 633 Emerson, Suite 100, St Louis, MO 63141
Hopemon Brothers, P.O. Box 820,435 Essex Ave, Waynesboro, VA 22980
Jamestown Metal Marine Sales, Inc, 4710 Northwest Second Avenue, Boca Raton, FL 33431
Marine Accommodations Inc., 8535-3 Baymeadows Road, Suite 140, Jacksonville, FL 32256

MARINE FURNITURE
Jomestown Metal Marine Sales, Inc, 4710 Northwest Second Avenue, Boca Raton, FL 33431
Marine Accommodations Inc, 8535-3 Baymeadows Road, Suite 140, Jacksonville, FL 32256
Wilson & Hayes, 1601 Eostlake Avenue, East, Seattle, WA 98102

MARINE SHIP MANAGEMENT
Arkhon Corp., 1810 Chapel Ave. West, Cherry Hill, NJ 08002
METAL PRODUCTS
Jamestown Metol Marine Sales, Inc., 4710 N.W. Second Ave., Boca Raton,FL 33431
Harrington Metal Fabrication, P.O. Box 410,6720 M 89, Fennville, MI 49408
NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Hwy., Arlington, VA 22202
Aero Nov Laboratories, Inc., 14-29112 St., College Point, NY 11356
Arctec Offshore Corp, 578 Enterprise St., Escondido, CA 92025
CDI Marine Co., 9487 Regency Square Blvd., Suite 500, Jacksonville, FL 32225
a Marine, 18 Church Street, Georgetown, 0 0829
Childs Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, MA 02026
Crane Consultants, 15301 First Ave S., Seattle WA 98148
C.R. Cushing, 18 Vesey St., New York, NY 10007
Arthur D. Darden, 3200 Ridgelake Dr., Suite 403, Metairie LA 70002
Design Associates Inc., 14360 Chel Menteur Highway, New Orleans, LA 70129
Designers & Planners, 2611 Jefferson-Davis Hwy, Ste. 3000, Arlington, VA 22202
Diversified Technologies, 812 live Oak Dr., Chesapeake VA 23320
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, IX 77706
GHM Inc. (Industrial Measurement Consultants), P.O. Box 1836, Newport News, VA 23601
Gibbs & Cox, Inc., 50 West 23rd Street, New York, NY 10010
The Glosten Associates Inc., 600 Mutual Life Bldg., 605 First Ave., Seattle, WA 98104
Morris Guralnick Associates, Inc., 130 Sutter Street, Suite 400, San Francisco, CA 94104
C. Raymond Hunt Associates, 69 Long Wharf, Boston MA 02110
Hydrocomp, Inc., 45 James Farm-Lee, P.O. Box 865, Durham, NH 03824
JJH Inc., No. 4 Executive Campus, Culbert Blvd. & Route 70, P.O. Box 5031, Cherry Hill, NJ 08034
R.D. Jacobs & Associates, 11405 Main St, Roscoe, IL 61073
James S. Krogen, 1515 NW 7th St, Suite 124, Miami FL 33125
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
John V. McCollum, Inc., 1199 Long Point Road, Mt. Pleasant, SC 29464
McElroy Machine & Mfg Co, Inc., P.O. Box 4454, Biloxi, MS 39535-4454
John J. McMullen Associates, Inc., 1 World Trade Center, Suite 3000, New York, NY 10048
MacPherson Maritime Services, 141 Jefferson Ave, Westfield NJ 07090
Fendall Marbury, P.O. Box 2321, Annapolis, MD 21401
Marine Design & Operations, Inc., 226 Chestnut St, Roselle Park, NJ 07204
Marine Management Systems Inc., 102 Hamilton Ave, Stamford CT 06902
Marine Power Associates, 1010 Turquois St, Ste 217, San Diego, CA 92109
Maritech, Seadiff, Boy Road, Newmarket, NH 03857
Maritime Design, Inc., 3020 Hartley Rd, Jacksonville, FL 32257
RJ. 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, Port Jefferson, NY 11777
Omega Marine Engineering Systems, Inc., 11757 Katy Freeway, Ste 1100, Houston TX 77079
QED Systems Inc., 4646 Witchduck Rd, Virginia Beach, VA 23455
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St, San Francisco, CA 94105
Sargent & Herkes, 225 Baronne St, Suite 1405, New Orleans LA 70112
Sea School, 10812 Gandy Boulevard, St. Petersburg, FL 33702
Seaworthy Systems Inc., P.O. Box 965, Essex, CT 06426; 17 Battery Pl, New York, NY 10004; P.O. Box 975, Barnegat Light, NJ 08006; 2 Skyline Pl, 5203 Leesburg Pike, Suite 700, Falls Church, VA 22041; 1305 Franklin St, Suite 210, Oakland, CA 94612.
George G. Sharp, Inc., 100 Church St, New York, NY 10007
R.A. Stearn, Inc., 253 N. 1st Ave, Sturgeon Bay, WI 54235
TIMSCO, P. 0. Box 91360, Mobile AL 36691
NAVIGATION & COMMUNICATIONS EQUIPMENT
Anschutz & Company, One Madison St, East Rutherford, NJ 07073
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, 0 06901-3004
Comsat Maritime Services, 950 L'Enlant Plaza SW, Washington DC 20024
EDO Corporation, 2645 S 300 West, Salt Lake City. UT 84115
Electronic Marine Systems, 800 Ferndale PL, Rahway, NJ 07065
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
Hose McConn, 9 Smith St, Englewood, NJ 07631
Henschel, Inc., 9 Hoyt Drive, Newburyport MA 01950
IDB Aero-Nautical Communications, 15245 Shady Grove Road, Rockville, MD 20850
Kenwood USA Corp, Marine Products Div, 2201 E. Dominquez St, Long Beach, CA 90810
Mockay 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
Mobile Telesystems, Inc., 300 Professional Drive, Gaithersburg, MD 20879
Naval Electronics, 5417 Jetview Circle, Tampa FL 33634
Norwegian Telecom, P.O. Box 6701, Oslo 1, NORWAY
Novatech, 820 Cormorant St, Victoria, BC V8W1R1, CANADA
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
Simrad, 19210 33rd Avenue West, Lynwood, 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
NOZZLES
Harrington Metal Fabrication, P. 0. Box 410, 6720 M 89, Fennville, MI 49408
P' **-Marine—Additives**
'-il Oil Corporation, 3225 Gallows Road, Fairfax, VA 22037-0001
X P.O. Box 2463, Houston, TX 77252
Mernational, 2000 Westchester Avenue, White Plains NY 10650
"ARATORS
ition, Inc., 955 Meorns Rd, Worminster, PA 18974-0556
''alia Separators), 100 Fairway Court, Northvale NJ 07647
'•<rth Broadway, St. Louis, M0 63147
»> Inwood NY 11696
<P -nley Industrial Ct, St Louis, MO 63144
Houghton, WI 53589
PAINT—COATING—CORROSION CONTROL
Amdeon Coating Removal, 12920 S.W. 99 N. Ave, Miami, FL 33176
Ameron, 201 N. Berry St, Brea, CA 92622
The Arnessen Corp, Corrosion Dynamics Division, 1100 Walmut Street, Rosell, NJ 07203
Enviro Coatings, Inc., 4560 Belt Line Rd, Suite 300, Dallas, TX 75244
Esgord, Inc., P.O. Drawer 2698, Lafayette, IA 70502
GlobalTedi, 9801 Westheimer St, Ste. 202, Houston, TX 77042
Jamestown Distributors, 28 Narragonsett Ave, P.O. Box 348, Jamestown, RI 02635
Hempel Coatings, Foot of Curie Avenue, Wellington, NJ 07057
Melvin Pierce Marine Coating, Inc., P.O. Box 93, Semmes, AL 36575
Microphor, Inc., Marine Division, 452 E. Hill Rd, P.O. Box 1460, Willits, CA 95490
Nalfleet Marine Chemicals, P.O. Box 11, Northwich, Cheshire, CW8 4DX, ENGLAND
Sigma Coatings, 8979 Market St, Houston, TX 77029,330 Rover Rood, Harvey, U 70059,1100 Adams St, Hoboken, NJ 07030
Unitor Ships Service, Unitor Marine Chemicals Division, 3 High St,
PIPE FITTINGS/CONNECTING SYSTEMS
Aeroquip Corporation, 3000 Strayer, P.O. Box 631, Moumee, OH 43537-0631
Deutsch Metal Components, 14800 S. Figueroa, Gordeno, CA 90248
Lokring, 396 Hatch Drive, Foster City, CA 94404
Stanley G. Flagg Co, 1020 W. High St, Stowe, PA 19464
Thaxton, Inc., 25 Leonburg Rd, Mars, PA 16406-8401
PORT SERVICES
Port of Portlond, 5555 N. Channel Ave, Portland, OR 97217
PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
Avondale Industries, Harvey Quick Repoir, P.O. Box 116, Harvey, LA 70058
American Air Filter, P.O. Box 35690, Louisville, KY 40432
ASEA Brown Boveri, 1460 Livingston Avenue, N. Brunswick, NJ 08902
ASEA Brown Boveri (Stromberg), P.O. Box 185, 00381 Helsinki, FINLAND
Argo International, 140 Franklin Street, New York, NY 10013
Aquomoster-Rauma Ltd, Box 220, SF-26101, Rauma, FINLAND
Bergen Diesel A/S, P.O. Box 924, N-5002, Bergen, NORWAY
Bird Johnson Company, 110 Norfolk St, Wolpole, MA 02081
CWF Hamilton & Co, Ltd, P.O. Box 709, Christchurch, NEW ZEALAND
Caterpillar, 100 NE Adams Street, Peoria, IL 61629-2320
Coltec Industries (Fairbanks Morse Engine Div.), 701 Lowton Avenue, Beloit, WI 53511
Cummins Engine Company, Moil Code 60011, Box 3005, Columbus, IN 47202-3005
Electro-Motive, div. General Motors, 9301 W 55th St, La Gronge, IL 60525
Fincantieri, Diesel Engines Divisio—GMT, Bagnoli della Rosandra 334, Trieste, ITALY
GE Naval & Drive Turbine Systems, 166 Boulder Dr., Fitchburg MA 01420
Kohlenberg Bros. Co, P.O. Box 358, Two Rivers, WI 54241
Krupp MaK, 7555 Danbro Crescent, Mississouga, Ontario, CANADA L5N 6P9
Mopeco Products Inc., P.O. Box 6, 725 Glen Cove Ave, Glen Head NY 11545
Marine Gears, Inc., P.O. Box 689, Greenville MS 38707
Marine Systems Inc., 2032 Atlantic Ave, Chesapeake VA 23324
Morkisches Werk, P.O. Box 1442, D-5884 Halver GERMANY
MAN B&W Diesel, 17 State St, New York, NY 10004
MAN B&W Diesel A/S, Ostervej 2, DK-4960 Holeby, DENMARK
MAN B&W Diesel A/S, Alpha Diesel, Niels Juels Vej 15. DK-9900 Frederikshavn DENMARK
MAN B&W Diesel GmbH, Stadtbachstrasse 1, 0-8900 Augsburg 1 GERMANY
MKW Power Systems, 301 S. Church St, Rocky Mount, NC 27801
New Sulzer Diesel, Ltd, CH 8401, Winterthur, SWITZERLAND
Nylands Marine Service A/S, P.O. Box 130, N-4818 Faervik, NORWAY
Omnithruster Inc., 9515 Sorensen Ave, P.O. Box 2144, Santa Fe Springs, CA 90670
Ovoko Steel Couplings AB Sweden, S-813 00 Hofors SWEDEN
Rollo SP Propellers SA, Via Silva 5, P.O. Box 251, 6828 Balerna SWITZERLAND
Rolla SP Propellers USA, 4030 Mustang Rood, Melbourne, FL 32934, USA
Karl Senner Inc., 25 W Third, Kenner LA 70062
Scholtel-Werft, D 5401 Spay, GERMANY
Stewart & Stevenson, 1400 Destrehon, P.O. Box 8, Harvey LA 70059-0008
Textron Lycoming, 550 Main St, Stratford, CT 06497
Thrustmaster of Texas, 12227-K FM 529, Houston, TX 77041
Ulstein International, A/S, N-6065 Ulsteinvik, NORWAY
J. M. Voith GmbH, Marine Division, Postfach 1940, D-7920, Heidenheim/Brenz, GERMANY U.S. Rep: Voith Schneider America Inc., 121 Susquehanna Ave, Great Neck, NY 11021
Oy Wartsila Ab, Vasa and Abo Divisions, P.O. Box 244, SF65100 Vasa, FINLAND
WesTech Gear Corp, 2600 E. Imperial Highway, Lynwood, CA 90262
Westinghouse Marine Div, 401E Hendy Ave, Sunnyvale, CA 94088
ZF ol North America, Marine Sales, 500 Barclay Blvd, Lincolnshire IL 60069
PROTECTIVE WRAPS
FANA (Film Applicators of North America), 1260 E Woodland Ave, Springfield PA 19064
PUMP—Repair—Drives
Be<kson Marine, 16S Holland Ave, Bridgeport, CT 06605
Coffin Turbo Pump, Inc., 326 S. Dean Street, Englewood, NJ 07631
Del Gavio, 619 Industrial Rd, Carldstodt, NJ 07072
Golten Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231
Jim's Pump Repair, 48-55 36th St, Long Island City NY 11101
Leistritz Corporation, 165 Chestnut Street, Allendale, NJ 97401
Vita Motivator, 99 W Hawthorne Ave, Suite 622, Volley Stream NY 11580
Wilden Pump & Engineering Co, 22069 Van Burren St, P.O. Box 845, Colton, CA 92324
REMOTE VALVE OPERATORS
Elliott Manufacturing, P. 0. Box 773, Binghamton, NY 13902
S. S. White Technologies, Inc., 151 Old New Brusnwick Road, Piscataway, NJ 08854
Teleflex, Inc., 771 First Ave, King of Prussia, PA 19406
ROPE—Manila—Nylon—Hawsers—Fibers
Allied Signal Inc., Fibers Division, 1411 Broadway, New York, NY 10018
American Manufacturing Co, 200 S. Pork Rood, P.O. Box 52125, Lafayette, LA 70505
Dupont, Montgomery 403, 1011 Centre Road, Wilmington, DE 19805
SANITATION DEVICE—Pollution Control
Jered Brown Brothers, 56 South Squirrel Rd, Auburn Hills, MI 48326
Byrne, Rice & Turner, Inc., 1172 Camp Street, New Orleans, LA 70130
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
Fast Systems, 3240 North Broadway, St. Louis, M0 63147
Microphor, Inc., 452 E. Hill Rd, P.O. Box 1460, Willits, CA 95490
Novatech, 820 Cormorant St, Victoria BC V8W IR1, CANADA
Red Fox Environmental Services, Inc., P.O. Box 53809, Lafayette, LA 70505-3809
Research Products/Blankenship (Incinolet), 2639 Andjon, Dallas, TX 75220
SCALE MODELS
Sturgeon Bay Model Shop, 187 N Ninth Ave, Sturgeon Bay WI 54235
SCUTTLES/MANHOLES
L.S. Baier & Assoc, 7527 NE 33rd Dr., Portland OR 97211
SHIPBUILDING EQUIPMENT
NEI Syncrolift, Inc., 8970 S W 87th Ct, Miami FL 33176
SHIPBUILDING—Repairs, Maintenance, Drydocking
Astilleros Espanoles SA, Padilla 17,28006 Madrid, SPAIN
Atlantic Marine, Inc,P.O. Box 3202, Mobile, AL 36652
Atlantic Marine, Inc., 8500 Heckscher Dr., Jacksonville, FL 32226
Avondale Industries Inc., P.O. Box 50280, New Orleans LA 70150
Bender Shipbuilding & Repair, P.O. Box 42, Mobile AL 36601
Bender Inc., 279 Great Valley Parkway, Malvern, PA 19355
BethShip, Sparrows Point Yard, Sparrows Point MD 21219
Bisso Marine Co, P.O.Box 4113, New Orleans, LA 70178
Bollinger Lockport & Larose, P.O. Box 250, Lockport, LA 70374-0250
Bourg Drydock, P.O.Box 1852, Houma, LA 70361
Chris-Marine AB, P.O. Box 9025, S-2000 39, Malmo, SWEDEN
Conrad Industries, 1501 Front Street, P.O. Box 790, Morgan City, LA 70381
Curacao Drydock Inc., P.O. Box 3012, Curacao, Netherlands Antilles
Eastern, 505 North Som Houston Pkwy. East, Ste. 150A, Houston, TX 77060
Fincantieri SpA Cantieri Navali Italiani, Via Cipro 11,16129 Genoa ITALY
Galveston Shipbuilding, 6800 Port Industrial Boulevard, P.O. Box 2660, Galveston, TX 77553
Gulf Croft, Inc., 3904 Highway 182, Patterson, IA 70392
Holler International, 7412 Lakeshore Drive, New Orleans, LA 70124
Hitachi Zosen, Hitachi Shipbuilding & Engineering Co, 1-1-1 Hitotsubashi, Chiyoda-ku Tokyo 100, JAPAN
Institute for International Research, 437 Modison Ave, N.Y, N.Y. 10022
Jacksonville, Shipyards, 750 E. Bay St, Jacksonville, FL 32202
Jeffboot, Inc., P.O. Box 610, Jeffersonville IN 47130
Kvaerner Fjellstrand, N-5632 Omostrand, NORWAY
Kvichak Marine, 615 N 34th St, Seattle, WA 98103
Lisnave, Apartodo 2138,1103 Lisbon, Codex PORTUGAL
MIL Davie, Inc., P.O. Box 130, Levis, Quebec, CANADA
Marco, Inc., 2300 W Commodore Way, Seattle, WA 98199
Munson Manufacturing, 150 Dayton, Edmonds WA 98020
Newport News Shipbuilding, 4101 Washington Ave, Newport News, VA 23607
New York Shipyard Corp, One Beard St, Brooklyn NY 11231
Nichols Brothers Boat Builders, 5400 South Cameron Road, Freeland, WA 98249
Norconsult Engineering Co, Inc., P.O. Box 529,5785 Plantation Rd, Theodore, AL36582
Protecno, Ltd, Rua Eugenio Castro, 13A-r/c, 2800 Almado, PORTUGAL, U.S. Rep: Walter Thorsen, Inc., 79 Oweno Rd, P.O. Box 755, Mahwah, NJ 07430-0755
Thomas Marine, 37 Bronslord Street, Potchogue, NY 11772
SeoArk, P.O. Box 210, Monticello AR 71655
SeaFab, P.O. Box 1651, 4111 Cedar St. Pascagoula, MS 39567
Service Marine Industries, P.O. Box 3606, Morgan City LA 70381
Skipperliner Shipyards, 621 Park Plaza Dr, Dept 21, LaCrosse WI 54601
Southwest Marine, Foot of Sampson St, San Diego, CA 92113-0308
Steiner Shipyard, Inc., P.O. Box 742, Bayou la Batre, AL 36509
Swath Ocean, 979 G Street, Chulo Vista, CA 92011
Textron Marine Systems, 6600 Plaza Drive, New Orleans, LA 70127-2584
Trinity Marine Group, Box 3029, Gulfport, MS 39505-3029
Viking Maritec, 300 Montour Place, Ste 211, Oakdale, PA 15071
Zidell Explorations, Inc., 3121 S.W. Moody Street, Portland, OR 97201
Zodioc of North America Inc., Thompson Creek Rd, P.O. Box 400, Stevensville, MD21666
SIMULATOR TRAINING
Houston Marine Training Services, 1600 20th Street, Kenner, LA 70062
Marine Safety International, Marine Air Terminal, LoGuardia Airport, NY 11371
SILENCERS
Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130
STABILIZERS
Naiad Stabilizers, Van Dusen & Meyer Inc., P.O. Box 558, Shelton, CT 06484
STAINLESS PLATE
Eastern Stainless Division, Cyclops Corporation, P.O. Box 1975, Baltimore MD 21203
STUFFING BOXES
Kohlenberg Bros. Co, P.O. Box 358, Two Rivers, WI 54241
SURVIVAL EQUIPMENT
Parkway/Imperial, 241 Raritan Street, South Amboy, NJ 08879
Schot Watercroft, P.O. Box 465, Ft of Industrial Rd, Farmingdole NY 07727
Stearns Monufacturing, P.O. Box 1498, St. Cloud MN 56302
Viking Life Saving Equipment, 1625 N Miami Ave, Miami FL 33136
TANK CLEANING EQUIPMENT
Polarmarine, Alvsborgsgaton 37, 72 Gothenburg, SWEDEN S-414
TANK LEVELING INDICATORS
ERL Marine Products div, PO Box 1026, New Albany, IN 47151-1026
Ian-Conrad Bergan, 3409 Gulf Breeze Parkway, Gull Breeze, FL 32561
IMO Industries, Gems Sensors Division, One Cowles Rd, Plainville CT 06062
Metritope, P0 Box 2366, Littleton, MA 01460-2366
Midland Mfg. Corp, PO Box 226, Skokie. IL 60076-0226
MMC International, 60 Inip Dr, Inwood NY 11696
Saab Marine Electronics AB, P.O. Box 13045, S 402 51 Goteborg SWEDEN
TOOLS
Ingersoll-Rand, Professional Tool Group, Allen & Martinsville Rd, Liberty 07938
Son Diego Marine Hardware, 1660 Logan Avenue, San Diego, CA 92113
TORSIONAL VIBRATION SPECIALISTS
T.W. Spaetgens, 156 W. 8th Ave, Vancouver, BC, CANADA, V5Y 1N2
Vibranalysis Engineering Corp, 9300 Gamebird, Houston, TX 77034
TOWING—Barges, Vessel Chartering, lighterage, Salvage, etc.
Balehi Marine Inc., P.O. Box 600, Lacombe, LA 70445
Jock Faulkner, 2419 Caddy Lane, Flossmoor IL 60422
TURBOCHARGERS
ASEA Brown Boveri, 1460 Livingston Ave, North Brunswick NJ 08902
VALVES AND FITTINGS
Aeroquip Corporation, 3000 Strayer, P.O. Box 631, Maumee OH 43537-0631
Circle Seal Controls, Brunswick Corporation, P.O. Box 3666, 1111 N. Brookhurst St, Anaheim, CA 92803
Cla-Val Co, P.O. Box 1325, Newport Beach, CA 92663
Cunico Corp, 214 N Hawaiian Ave, P.O. Box 306, Wilmington CA 90748
Derbyshire Machine & Tool, 5100 Belfield Ave, Philadelphia, PA 19144-1788
Dolsey Ltd, 863 West 44th Street, Norfolk, VA 23508
Elliot Manufacturing, P.O. Box 773, Binghamton, NY 13902
ERL Marine Products div, PO Box 1026, Nwe Albany, IN 47151-1026
Hall-Toledo, Inc., 525 West Sophia, Maumee, OH 43537
Hydra-Search Co Inc, 120 Admiral Cochrane Dr, Annapolis, MD 21401-7399
Leslie Controls, 1250 Telecom Dr, Tampa, FL 33637
Loeffler Machine, US#1 & Robbins Ave, Penndel PA 19047
MMC International, 60 Inip Dr, Inwood NY 11696
Stacey/Fetterolf, P.O. Box 103, Skippock, PA 19474
Stanley G. Flogg Co, 1020 West High St, Stowe, PA 19464
Zidell Explorations, Inc, 3121 SW Moody Ave, Portland OR 97201

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Row Technology, Inc., P.O. Box 265, Littlestown PA 17340
VIBRATION ANALYSIS
DLI Engineering Corp., 253 Winslow Woy West, Boinbridge Island, WA 98110
T. W. Spaetgens, 156 W 8th Ave., Vancouver BC CANADA V5Y1N2
Vibranalysis Engineering Corp, 9300 Gamebird, Houston, TS 77034
VIDEO—Training
Walport U.S.A. Inc. (WUSA) 840 Bond Street, Elizabeth NJ 07201
WASTE SERVICES
Browning-Ferris Industry, (Medical Waste Systems) 757 N. Eldridge, Houston, TX 77079
WASTEWATER TREATMENT
Eltech International Corp, 12850 Bournewood Dr, Sugarland TX 77478
Envirovac, 1260 Turret Drive, Rockford, IL 61111
WATER PURIFIERS
Alfa-Laval, Desalt A/S, Stamholmen 93, DK-2650 Hvidovre, Copenhagen,DENMARK
Alfa-Laval Separation Inc, 955 Mearns Rd, Warminster, PA 18974
Beaird Industries Inc, P.O. Box 31115, Shreveport LA 71130
Everpure, Inc, 660 N. Blackhawk Dr, Westmont, IL 60559
Exstar International, 6502 Windmill Way, Wilmington, NC 28405
Ufestream Water Purification Equipment, P. 0. Box 634, Long Beoch, CA 92648
Matrix Desalination, Inc, 3295 SW 11th Ave, Fort Lauderdale, FL 33315
Sea Recovery Corp, P.O. Box 2560, Gardena, CA 90247-0560
WEATHER CHART RECORDERS
Alden Electronics, 40 Washington St, Westborough, MA 01581
WELDING
Miller Electric Manufacturing, P. 0. Box 1079, Appleton, WI 54912
Welding Consultants USA, 10399 Paradise Blvd. #101, St. Petersburg, FL 33706
WINCHES AND FAIRLEADS
Broden Corco Geormotic, P.O. Box 547, Broken Arrow, OK 74013
Jeamar Winches Ltd, 53 Maple Ave, Richmond Hill, Ontario L4C 6P3, CANADA
MMC International, 60 Inip Dr, Inwood NY 11696
Markey Machinery Co, 79 South Horton St, Seattle, WA 98134
McElroy Machine S Mfg Co, Inc, P.O. Box 4454, Biloxi MS 39535-4454
New England Trawler Equipment Co, 291 Eastern Avenue, Chelsea, MA 02150
Nordic Machine Manufacturing, 4700 Ballard Ave, NW, Seattle, WA 98107
S-L-M Corporation, 1101 John Avenue, P.O. Box 39, Superieor, WI 54880-0039
Smith Berger Marine Inc, 516 S. Chicago St, Seattle, WA 98108
WINDOWS-Windshield Wipers
GEC-Marconi Electronic Systems Corp, 550 S. Fulton Ave, Mt. Vernon, NY 10550
Morketec, Inc, P.O. Box 999, Pisgah Forest NC 28768
WIRE AND CABLE
Seocoast Electric Company, Station Plaza, Rye NY 10580

Wink Joins Roland Marine As Sales/Service Manager

Roland Marine, Inc., New York, recently announced that **Charles H. Wink** has joined the company as sales & service manager.

Mr. **Wink,** who holds degrees in marine engineering, management and finance, comes to Roland Marine from General Dynamics-Electric Boat.

Roland Marine are the exclusive U.S. and Canada sales agents for Kobe Steel's kobelco sterntube seals; DMT Marinetechnik GMBH's ships automation, steering gears and other components; and Zoellner GMBH's dynamometers.

Mr. **Wink** directs three factory trained sterntube seal service technicians.

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Tidewater & Zapata Merge To Form World's Largest Offshore Fleet

Tidewater, Inc., Houston, has acquired Zapata Gulf Marine Corp. for $407 million. As a result of the merger, the Tidewater owned fleet of 580 vessels is now the world's largest to serve the international offshore energy industry.

As a result of the deal, Zapata Gulfs three owners received $315 million in Tidewater stock, and Tidewater will also be assuming $92 million in debt from Zapata.

Zapata Corp of Houston, the majority partner of Zapata Gulf Marine, is an oil producer started in the 1950s by President **George Bush,** who no longer holds any interest in the company.

Cast Launches Inland Waterway Service Along Rhine River

An inland waterway service along the Rhine River is being launched by Cast, the trans-Atlantic shipping line of Zeebrugge, Belgium.

Since it moved its European hub to Zeebrugge in January after 22 years at Antwerp, Cast's inland distribution operations are being overhauled, resulting in the new inland waterway service.

The service will be operated by two Russian-built barges which will carry containers to and from Rotterdam, Dormagen, Mainz, Mannheim and Karlsruhe for Cast's weekly trans-Atlantic service between Zeebrugge and Montreal, Canada. Each barge, on two-year charter, can carry 200 twenty-foot containers.

Cast also has a European inland transport fleet of 72 tractors and more than 120 trailers, handling a major part of its container traffic on roads between Zeebrugge and France, Germany and the Benelux countries.

Cast now runs its container services to the English port of Ipswich; Varberg, Sweden; Frericia, Denmark; and Kiel, Germany, from Zeebrugge.

Around 170,000 containers are expected to be handled by Cast through its Zeebrugge terminal this year, leaving some 330,000 containers of unused capacity. A Cast spokesman said the company is looking for another noncompeting carrier to take up some of the slack.

More Casinos Attracted As States Legalize Riverboat Gambling

Caesars World and Circus Circus Enterprise Inc. have already announced plans to build a $2 billion gambling and family entertainment complex in downtown Chicago, and with riverboat gambling now legal in a growing number of states, two more corporations—Harrah's Casino Hotels and Hilton Hotels Corp.—have decided to join the move.

A 2,000-passenger casino riverboat based in Joliet, 111., is planned by Harrah's, aimed at drawing passengers from nearby Chicago. The boat will be based on the Des Plaines River, and plans call for no minimum or maximum betting limits, as opposed to the low limits put on most riverboat gambling now.

A 3,000-passenger gaming boat to operate from New Orleans is being planned by Hilton Hotels Corp. A New Orleans company that already operates passenger paddle wheelers on the Mississippi will be its partner in the venture.

Chinese Buyers Purchase Third New VLCC

The Bermuda-based company, Golden Ocean, recently resold a 280,000-dwt tanker to Chinese buyers acting on behalf of the shipping group Sinochem. The buyer has been reported to be Ocean Tramping of Hong Kong, which is supposedly controlled by Sinochem.

The purchase price of the vessel was about $88 million. This is the third VLCC purchased by the Chinese in its effort to acquire new tonnage.

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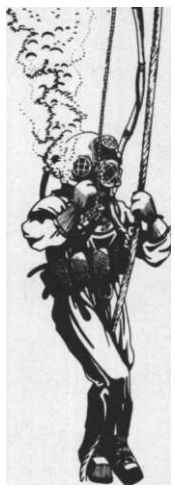

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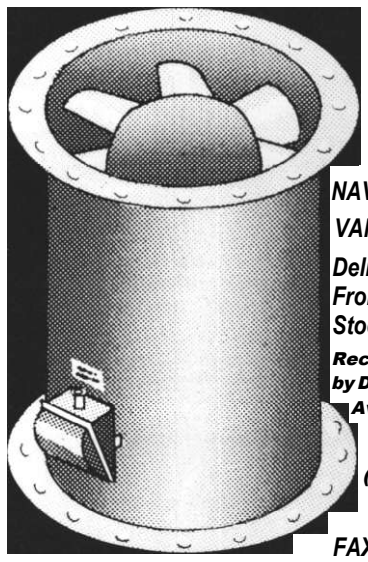

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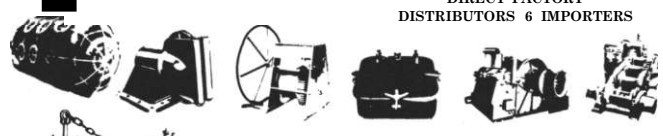

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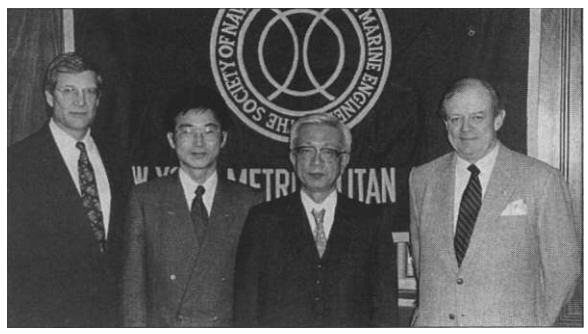

Participants at the recent SNAME N.Y. Metropolitan Section included (left to right): **Philip B. Kimball,** section vice chairman; **Yoshitoh Okumura** and **Nobuyuki Okui,** IHI authors; and **Wesley D. Wheeler,** section treasurer.

LNG Tankers Using IHI SPB Containment System Detailed At SNAME Seminar

A paper focusing on the "Introduction and Construction of LNG Carriers Using IHI SPB Containment System" was recently presented at a meeting of the New York Metropolitan Section of the Society of Naval Architects and Marine Engineers (SNAME).

Recently retired SNAME executive secretary **Robert Mende** was the guest of honor at the meeting.

The paper, presented at the Downtown Athletic Club in Manhattan by authors **Yoshitoh Okumura** and **Nobuyuki Okui,** both of Ishikawajima-Harima Industries (IHI), detailed the development of the SPB LNG carrier design using self-supporting prismatic type tanks made of aluminum alloy. IHI based its design on previous efforts of LPG and LEG tankers. This containment system complies with the Type B requirements of the IMO Gas Carrier Code, and in 1985 was given full approval by the major world classification societies and the U.S. Coast Guard.

As detailed in the presentation, several factors went into IHI's decision to opt for a self-supporting prismatic tank. Because its structure and geometry are traditional, conventional shipbuilding practices could be used. New larger computer systems are well able to accommodate the complex stress, fatigue and finite element analyses required for a Type B tank design. A ship containing these tanks could utilize a traditional strong hull system with a continuous deck. The tank system would have internal bulkheads to minimize sloshing, and longitudinal bulkheads to allow loading to different levels. Finally, the technology would not be limited by the size or application constraints. For example, it can be utilized in a wide range of LNG ship sizes or for floating LNG units such as FPSOs.

Errata

An AWO article in the March issue focusing on the legislative challenges which face the tug and barge industry contained several printer's errors which altered the author's original text. To clarify, the Coast Guard is required to develop a Regulatory Impact Analysis this year, which will assess the impact of vessel operators being unable to secure insurance coverage which meets the Coast Guard's proposed test of financial responsibility. The Coast Guard's proposed structural options for single hulls over 5,000 gross tons included double sides, double bottoms, and protectively located segregated ballast tanks, which AWO rejected on the basis of economic and technical unfeasibility. The AWO emphasizes the importance of viewing tankers and tank barges separately when examining the feasibility of regulations being developed by the Coast Guard as mandated by OPA 90. Additionally, Sockeye salmon have been designated as an endangered species.

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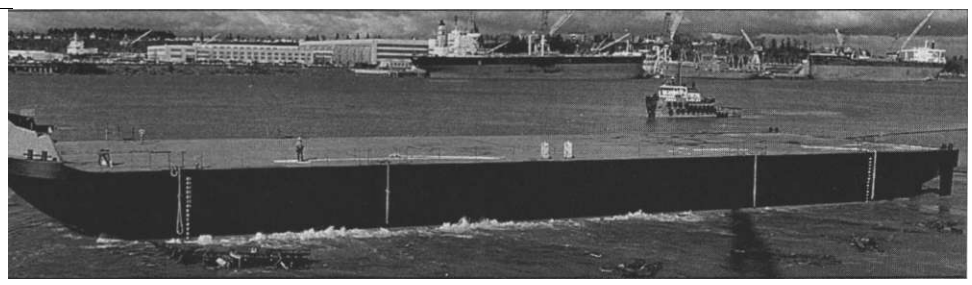
OCEAN DECK BARGES

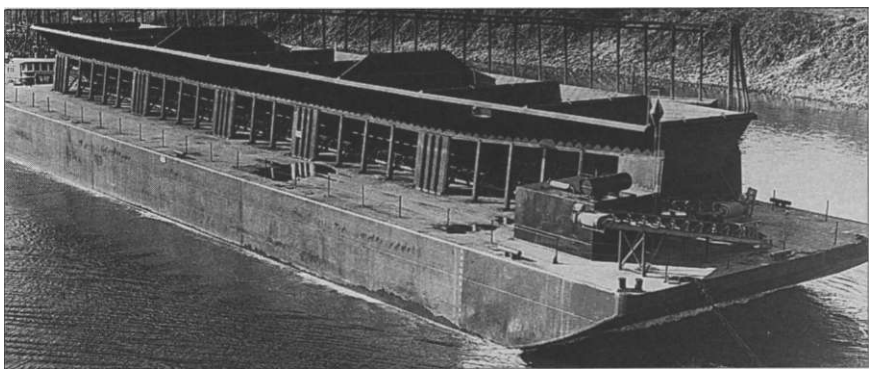
	299'0"	302'0"
	90'0"	***76V"***
Depth . .	20'0"	***20'0"***
Deadrise	-	***2'0"***
	27-1/2"	3'10"
	15'10"	16'
	7	8
	3	1
	32	18
Rolled Bilge		**24"**
	29'	**49'**
	30'	50' Long Curved Rake
Deck Open Deck Area	25,284 S.F.	19,950 S.F.
Cargo:	2,050 P.S.F.	2,500 P.S.F.
	9,604 LTSW	7,236 LTSW

Maltese Cross A-I Deck Barges

i



SELF-UNLOADING AGGREGATE BARGE

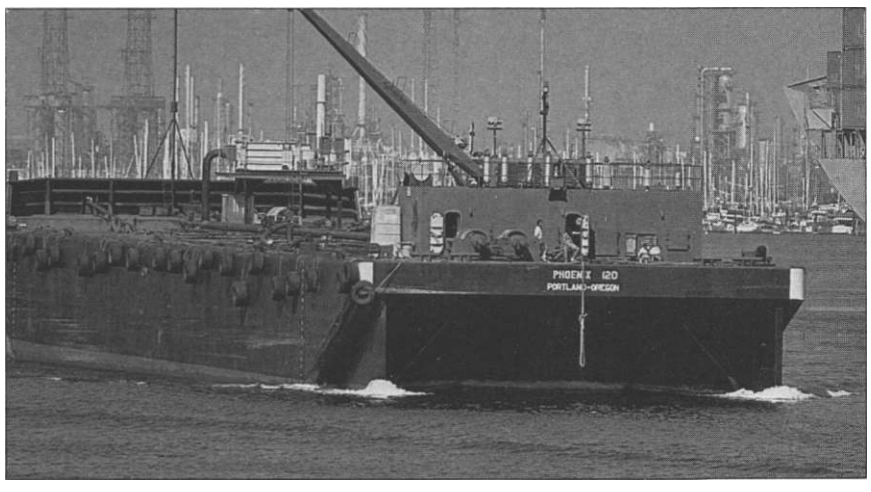


Billie-K Maltese Cross A-1 Ocean Aggregate Barge

Length	250'0"
Beam	***72'0"***
Depth	15'0"
Draft Light	2'5"
Draft Loaded	11'8-3/4"
DWT	4603 LTSW
Diesel Electric Set	Cat 3406 Turbo, 260 KW Generators, Sullair Model 351 Air Compressor
Hopper Capacity	3,000 Yds
Hopper Unloading Gates	24 Unloading Gates, Pneumatic Operating Rams
Main Unloading	Conveyer Starboard Side Aft
Transfer Conveyer	30" Belt Conveyers, 184' ea. P/S
Hull Plating	1/2" Side, Bottom, Deck

MALTESE CROSS A-1 OIL TANK BARGE

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



SPLIT TYPE SELF-DUMPING SCOWS

Length	180'0"
Beam	50'0"
Depth of Mid-Body	14'0"
Hopper Length	128'0"
Level Hopper Volume	1,421 cu. yd.
DWT @ d = 10.22 ft	1,615 L.T.
Rake Lengths F. & A.	26'0"
Twin Skegs	
Stern & Fwd. Rake Decks Stepped up 2'0"	
Engine GM 671	
Hydraulic Pumps 12 GPM & 75 GPM	
Time to Open (Fully Closed to Fully Open)	6 Min. 5 Sec.
Time to Close	4 Min. 34 Sec.
Hopper Angle Fully Open	53.78 degrees
Fuel Tank Capacity	445 Gal.
Hydraulic Cylinders (2 Fwd. & 2 Aft)	18" Diam. 120" Stroke
Plating	Side, 9/16", Bottom, 5/8" Hopper, 5/8"

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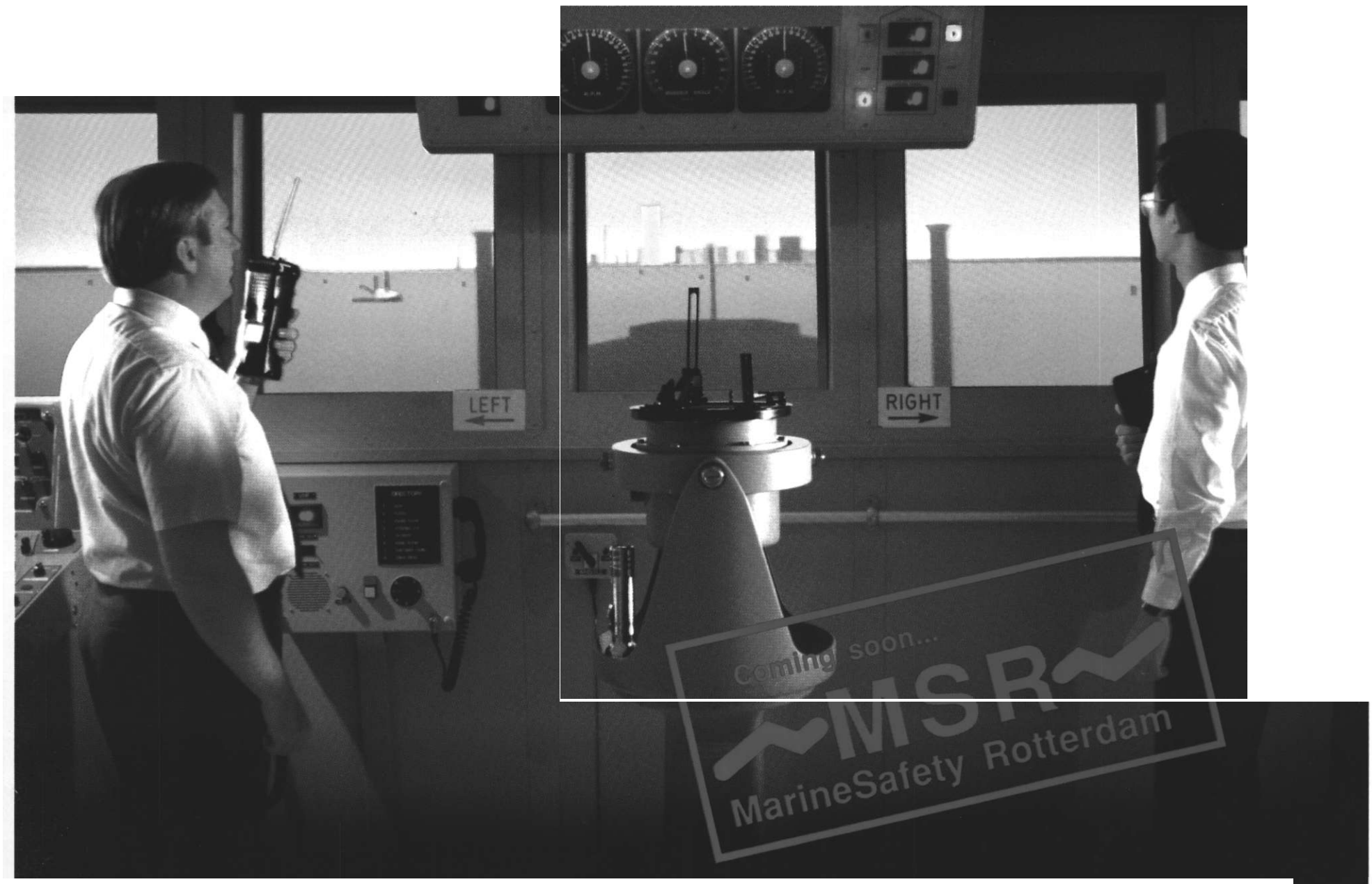

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