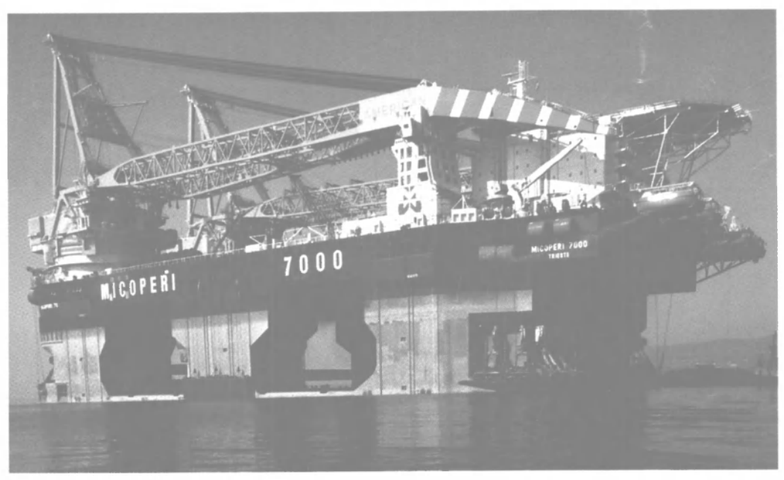
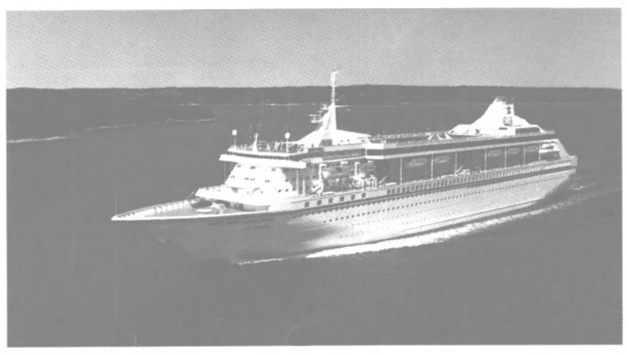
MARITIME REPORTER
AND
ENGINEERING NEWS

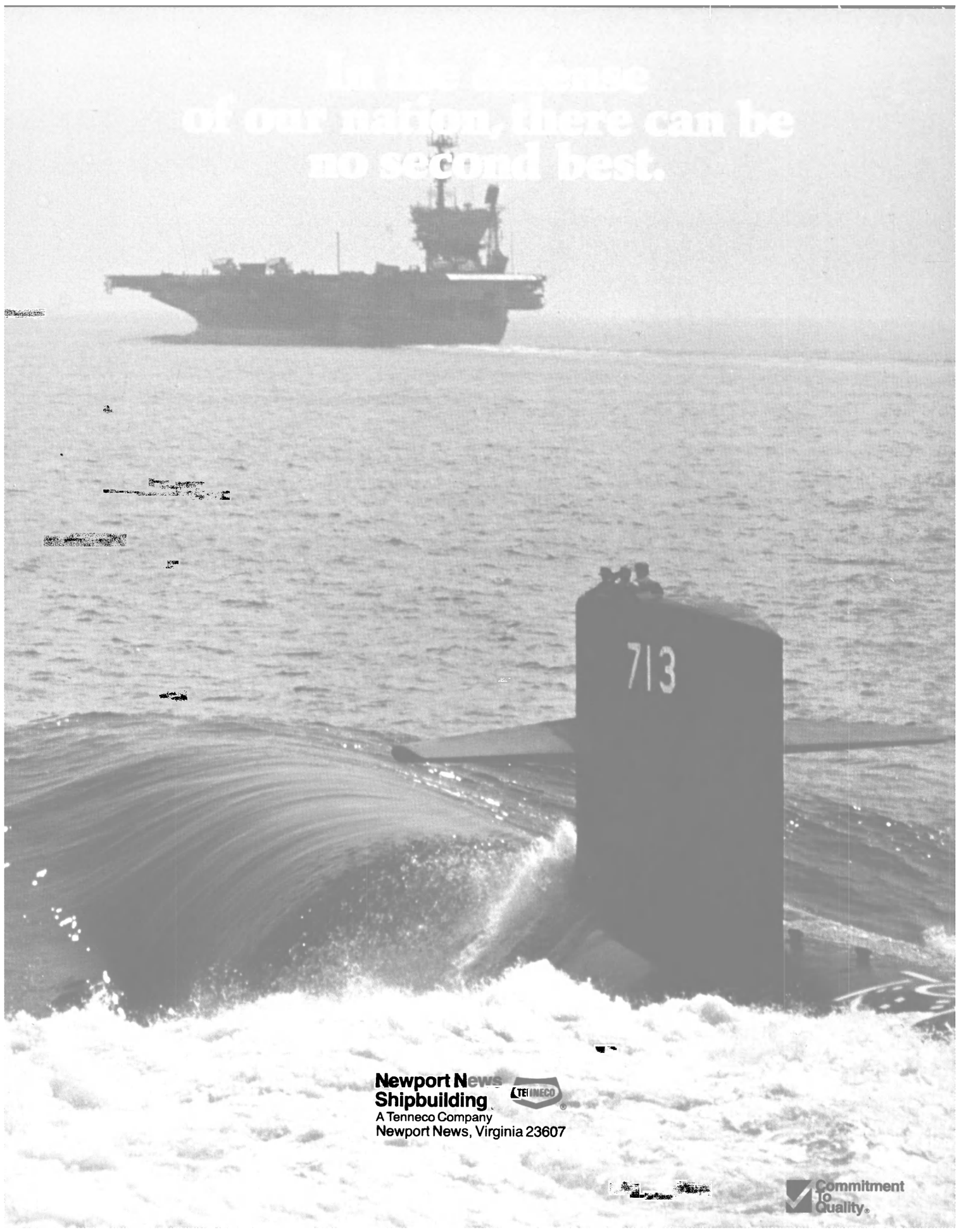




NAVAL TECHNOLOGY & SHIPBUILDING

OUTSTANDING OCEANGOING VESSELS

DECEMBER 1988 ISSUE


of our nation, there can be
no second best.
713
Newport News
Shipbuilding
A Tenneco Company
Newport News, Virginia 23607
TENNECO
Commitment
to
Quality.

Fjellstrand To Deliver West Germany's First High-Speed Catamaran

Fjellstrand a.s. of Omastrand, Norway, is scheduled to deliver a 127.3-foot advanced slender catamaran (ASC) to AG EMS Emden, West Germany, in the spring of 1989.

The new catamaran, ranked as the first delivery of this type to a German owner, will have capacity for 272 passengers. It will be the first high-speed catamaran to fly the German flag, be classified in accordance with Germanischer Lloyd's rules and be certified by the See-Berufsgenossenshaft. The vessel will be equipped with a propulsion system comprising MTU engines, ZF gears and KaMeWa water jet. It is expected to have a maximum speed of 38 knots.

Since the introduction of its successful 127.3-foot advanced slender catamaran in 1985, Fjellstrand a.s. has secured construction contracts for 25 vessels of this type, including 21 for export to 13 different nations.

For free literature giving complete details on the facilities and capabilities of Fjellstrand a.s.,

Circle 53 on Reader Service Card

Mapeco Named Marine Engineering Representative Of Southern Bolt

Mapeco Products, Inc., manufacturers of Pilgrim Nuts and Morgrip Bolts since 1967, has recently been named the marine engineering representative of the Southern Bolt And Fastener Corporation of Shreveport, La.

Southern Bolt, established in 1960, is a manufacturer of large-diameter specialized fasteners. Capabilities include hot-upset forging through 4-7/8-inch diameter, precision machining of all exotic alloys, in-house heat treatment and a complete metallurgical laboratory. Typical materials are high-strength low-alloy steel, heat- resistant alloys, all grades of stainless steels, nickel and super alloys.

Southern Bolt has supplied specialized fasteners for nuclear steam equipment, naval propulsion and critical piping systems with Subsafe/Level I approval. Their Quality System has been audited and certified to MIL-I-45208A and MCS6(a).

For more information and free literature,

Circle 51 on Reader Service Card

Diesel America Completes Diesel Pump Order— Literature Available

Douglas L. Oehrlein of Diesel America, Inc., New Orleans, La., recently announced the delivery of 25 lightweight diesel pumps to boat and barge operator Hollywood Marine, Houston, Texas.

Mr. **Oehrlein** recently recalled: "Hollywood was one of the first companies to try our new lightweight diesel pumps. Initially they began converting their existing pumps over with our diesel under our Repower Program. However, as their experience grew with our pumps, they finally elected to purchase all new pumps. The new line of lightweight diesel pumps weigh only about 80 to 85 pounds, and start easily with a recoil rope-type starter. The units are diecast aluminum pumps with cast iron volute and impellor. The housing is epoxy coated and the unit comes in a protective roll cage. The new pumps are powered by Yanmar L40 air-cooled diesels which operate at 3,600 rpm. The unique package brings Hollywood Marine the size, starting convenience, cost and weight of gasoline-powered pumps along with the fuel economy, safety, long life and reliability associated with diesel engines."

Diesel America produces a full line of lightweight diesel pumps including centrifugal, trash and diaphram. The company builds special-purpose fire pumps, diesel power compressors, pressure washers, generators, and other special-purpose diesel equipment.

For free literature fully detailing the products of Diesel

Circle 83 on Reader Service Card

AMP Offers Low-Cost Method Of Marine Cable Splicing—Literature Offered

The AMP Marine Cable Splicing Kit from AMP Products Corporation, Valley Forge, Pa., provides the marine industry with an advanced wiring method for modular shipbuilding, jumboizing and repairs. According to the manufacturer, the AMP splicing system is the first safe, waterproof, corrosion- and impact-resistant, abrasion-protected, industry-accepted, low-cost method of marine cable splicing.

The AMP Marine Cable Splicing Kits include pressure-type AMP Butt Connectors; AMP Thick Wall Heat Shrink Tubing with Sealant (MIL-I-23053/15) throughout for replacement cable jacket; and AMP TERMI-FOIL Grounding Harnesses for maintaining electrical continuity of armor.

Reviewed and accepted by both the U.S. Coast Guard and the American Bureau of Shipping, this marine splicing kit eliminates long cable pulls and allows for splicing of wiring cables at modular breaks. In addition, it splices low smoke Navy cable as well as commercial cable for both new construction and repair.

Additional benefits of the product include cost savings associated with the ability to salvage broken shipboard cables, as well as faster repair completion which allows for preplanning of electrical work in damaged vessels.

For additional information and free literature on the AMP Marine Cable Splicing Kit,

Circle 39 on Reader Service Card

McDermott Lays Keel For First Of Three Craft In $32.6-Million Contract

McDermott Shipyard officially marked the beginning of construction of torpedo test craft for the U.S. Navy with a keel-laying ceremony for the YTT 9, the first of three such craft being built by McDermott at their Morgan City, La., yard. The craft will be operated by the Naval Undersea Warfare Engineering Station (NUWES) in Keyport, Wash.

The Naval Sea Systems Command awarded McDemott a $21.7-million prime contract to design and construct the YTT 9 and YTT 10, and a $10.9-million contract for YTT 11. McDermott's YTT design, developed from a proven offshore supply ship hull configuration, is 187 feet in length, with a 40-foot beam and berthing capacity for 40 personnel.

The craft will be powered by a single-screw geared diesel and by two electric-driven Z-drives. The YTT Machinery Control System, which provides for unattended engine room operation, is a Bailey Controls "Network 90" microprocessor-based control system. Bailey is a McDermott Company based in Ohio.

The YTT 9 is scheduled for delivery to the Navy at the McDermott Shipyard in August 1989, YTT 10 in November 1989, and YTT 11 in January 1990.

McDermott Shipyard, a division of McDermott Marine Construction, builds and repairs special purpose Navy ships, ferries, large tugs, supply boats, barges, dredges, and a wide variety of oceangoing work vessels.

For more information and free literature giving complete details on the facilities and capabilities of McDermott Shipyard,

Circle 35 on Reader Service Card

Butterworth Adds Eighth U.S. Supply Center—Marine Hardware

Marine Hardware Company of San Pedro, Calif., serving the metropolitan areas of Los Angeles, San Diego Harbor, and Santa Barbara, recently became the eighth Butterworth Supply Center in the U.S.

The addition of Marine Hardware Company to the Butterworth chain of supply centers domestically and abroad keeps pace with the company's current plans for expanding the availability of Butterworth rental units to customers worldwide.

A major supplier of marine products, Marine Hardware Company maintains an inventory of 28,000

items in stock, including a complete rental inventory of Butterworth tank cleaning machines.

This newest U.S. supply center for Butterworth products also maintains a full range of Butterworth brand tank cleaning hose, marine equipment products, and accessories.

For further information and free literature,

Circle 30 on Reader Service Card

R.J. Bazzini Associates To Represent Goltens-USA —Literature Available

Robert J. Bazzini, P.E., of R.J. Bazzini Associates, a company that specializes in the application and sale of engineered equipment and systems, recently announced that his company has been named the representative of Goltens-USA, a worldwide organization with headquarters in Brooklyn, N.Y.

Goltens-USA is an authorized supplier and repair shop for most of the world's major diesel engine manufacturers. Some of their services are: main journal and crankpin reconditioning; centrifugal rebabbitting of bearings of all sizes; relocation of twisted crankshafts; general machining, either in-place or in their well-equipped facilities worldwide; development and implementation of preventive maintenance contracts for diesel cogeneration plants of all sizes.

For more information and free literature describing the services of both companies,

Circle 58 on Reader Service Card

Waterman Acquired By International Shipholding

Waterman Marine Corporation recently signed a definitive agreement with International Shipholding Corporation to sell its assets for about $34 million, according to **Niels W. Johnsen Sr.**, chairman of International Shipholding.

The sale of Waterman, which requires Maritime Administration approval, would mean the transfer of six U.S.-flag Waterman-operated ships to a new subsidiary of International Shipholding.

At present, International Shipholding's principal subsidiary is Central Gulf Lines, Inc., which operates eight U.S.-flag vessels.

Crane Valve Division Names Michael Sharp VP, Sales And Marketing

Crane Co. Valve Division recently announced the appointment of **Michael Sharp** as vice president of sales and marketing.

Previously vice president of sales and marketing with Lee Brass, Mr. **Sharp** brings 15 years of experience in the pipe, valve and fittings industry to his new position.

Kiene Offers Improved Diesel Compression Set —Literature Available

The C-400 diesel compression test set with a new protective rubber gauge collar for longer service life is now available from Kiene Diesel Accessories, Inc. of Addison, Ill.

The rugged, heavy-duty tool features a 0-1000 psi gauge with a vent valve that releases pressure so successive compression readings can be conveniently taken. Flexible steel braid, fabric covered connector hose attaches easily, regardless of injector opening location. Nozzle injector adapters for over 500 automotive-type diesels used in agriculture, transportation, construction and industrial applications are available, as well as an optional kit for leak down or cylinder air testing. The C-400 compression test set meets current military specifications and comes with a metal carrying case that holds as many as eight adapters.

Mechanics, maintenance engineers, shop foremen and fleet owners who want an easy, economical and reliable way to test diesel compression can send for a specification brochure. For a free copy,

Circle 32 on Reader Service Card

Trinity Industries Acquires Aluminum Boats, Inc.

Crown Point, La., Yard Will Join Marine Group

Trinity Industries, Inc., Dallas, Texas, has acquired the assets of Aluminum Boats, Inc., a Crown Point, La., shipyard specializing in the construction, conversion, and repair of commercial aluminum boats. The terms of the sale were not disclosed.

The announcement of the acquisition was made by **John Dane III**, president of the company's New Orleans-based Trinity Marine Group. Mr. **Dane** said that Aluminum Boats, Inc., will become part of the marine group.

The Trinity Marine Group includes Halter Marine Inc., shipyards in Moss Point, Miss., and Lockport, La., Moss Point Marine Inc., in Escatawpa, Miss., Equitable Shipyards, Inc., with shipyards in New Orleans and Madisonville, La., and Gretna Machine and Iron Works, Inc., in Harvey, La.

Aluminum Boats, Inc., was established in 1983, by **Salvador J. Guarino**, its president, on the site of the former Camcraft, Inc. Employing many of the former Camcraft shipbuilders, Aluminum Boats Inc., has delivered 35 new vessels, and converted or repaired 23 more since its founding.

The company occupies approximately 10 acres in its suburban New Orleans location and employs approximately 50 persons with an estimated annual payroll of $1 million.

Mr. **Dane** said the acquisition was a "natural," as Aluminum Boats Inc., had recently served as a subcontractor on several Trinity projects. He said other factors were the shipyard's high quality reputation, increasing demand for aluminum vessels, and the extensive business contacts of the shipyard's management on the East Coast and Middle East.

Mr. **Dane** said Mr. **Guarino** will remain as general manager of the shipyard. Mr. **Guarino** had served as chief purchasing agent of Halter Marine, Inc., from 1969 to 1978, and president of Marine Specialty and Mill Supply Co., a wholly owned subsidiary of Halter Marine Inc., from 1978 to 1980.

For free literature on the shipbuilding facilities and services of the Trinity Marine Group,

Circle 79 on Reader Service Card

Donald Peck Appointed Assistant Vice President, Moran Towing Of Florida

Donald Peck has been appointed by **Thomas E. Moran**, chairman and chief executive officer of Moran Towing Corporation, to the position of assistant vice president of Moran Towing of Florida, Inc.

Mr. **Peck** started his tow-boating career with Moran's Baltimore subsidiary in 1964 as a tug dispatcher. He was promoted to assistant operations manager in 1975 and operations manager in 1979.

Waugh To Supply TNF Joiner System For S.S. Azure Seas

The Waugh Co., Jacksonville, Fla., has obtained the contract to supply the Rockwool TNF Joiner System, consisting of floating floors, linings and partitions, continuous ceilings and doors, to be installed on board the Admiral Cruise Line's S.S. Azure Seas.

The coordination of the design and purchase of the Rockwool TNF System is being managed by the Professional Design Group, and is to be installed by KDR Building Specialties, Inc. of California.

The project involves complete renovation of the deluxe suites, which include queen-size beds, living room and large bathrooms with sunken jacuzzi-type bathtubs, a new theatre and meeting room with seating capacity for 60 people, and work on the promenade and boat deck casinos and stores. Great emphasis has been placed on the sound reduction characteristics of the Rockwool TNF Joiner System, which will provide the passengers with the equivalent comfort and quietness of a five-star hotel suite.

For more information and free literature from The Waugh Co.,

Circle 37 on Reader Service Card

Second 600-Berth Cruise Ship Ordered From MHI By Mitsui Osk Lines

Mitsubishi Heavy Industries (MHI) has received an order from Mitsui Osk Lines for a second 600-berth cruise ship. The vessel is scheduled to be delivered in the summer of 1990.

Intended for service on the Western cruise markets, the new vessel and her sister ship Fuji Maru (already launched), are being built with loans backed by the Japanese Government.

In addition to the two vessels mentioned above, Mitsubishi is also building a larger 960-passenger ship for Nippon Yusen Kaisha, Japan's largest owner, making a total of three Japanese cruise ship bookings by MHI.

Sims Pump Valve Offers Durable Composite Impellers And Parts For Marine Use

New Literature Offered

Precision composite parts manufactured by the Sims Pumps Valve Co., Hoboken, N.J., have been successfully employed on seagoing vessels for nearly 30 years.

In 1955, Sims Pump Valve introduced a casing ring made of a composite material called Simsite. The highly innovative use of this composite material met with great success. Six years later, the first Simsite impeller joined the already proven Simsite casing ring.

According to Sims, Simsite graphite impellers are hydraulically and mechanically superior to cast metal impellers. They are precision machined on both the outside and the inside of the impeller providing absolutely uniform vane characteristics and tolerances of .002 inches. Fluid flow is, therefore, unaffected by casting imperfections, balance problems or rough surfaces.

The light weight of these impellers substantially reduces static deflection and radial forces in a pump helping to provide much longer rotating element life expectancy.

Sims claims that Simsite will not corrode in salt or brackish water. Because of these inherent advantages, the balance, performance and efficiency of pumps with Simsite impellers remains constant. These impellers can be custom designed to solve such troublesome problems as recirculation cavitation or radial reaction.

Engineered composite pump components designed and manufactured by Sims since 1919, include wear rings, casing rings and bushings, all of which exhibit low wear, corrosion resistance and enhanced performance in shipboard applications.

Impellers and casing rings and parts are made of a composite material called Simsite, which offers durability, corrosion resistance, economy and diversified use.

Simsite parts are used extensively in ships operated by such leading operators as Carnival Cruise Lines, Sea Land and Chevron. Because of its unusual durability, Simsite is also being considered for use in decorative and structural elements.

Sims Pump Valve Co. was also recently involved in the installation of Simsite impellers at Florida's Miami Seaquarium. The Sims venture into handling large volumes of seawater on land occurred when it responded to an emergency call by the Seaquarium by replacing worn out metal pump impellers that serve the attraction's whale holding tank with Simsite impellers. Installed only one week after they were ordered by the Seaquarium, the Simsite impellers perform flawlessly in the 1,200-gpm pumps that move five million gallons of seawater daily.

For free literature detailing Sims Pump Valve products,

Circle 85 on Reader Service Card

The shortest distance between two points...

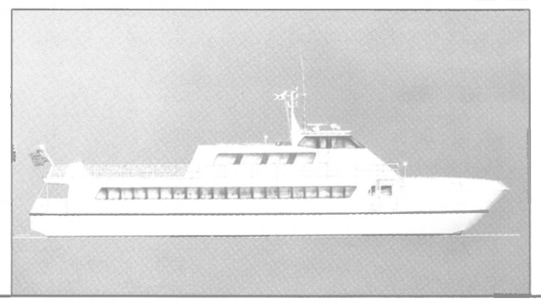
is coming off the ways at Avondale.

The internationally recognized expertise of Avondale Industries, Inc. in the fabrication of commercial and combatant ships is being applied today to smaller craft. The Avondale Boat Division, capitalizing on the company's superior engineering and assembly technology, is capturing contracts to build state-of-the-art boats for demanding customers. Such as the high-speed, surface effect passenger ferries ordered recently by Tri-State Marine Transport, Inc.

These remarkable boats will travel 50 knots-plus and get 400 busy executives from Kennedy to Wall Street or vice versa in minutes–most definitely the fastest route between these two points.

Avondale was chosen for this job because of our reputation for quality control, ability to meet tight deadlines and competitive pricing.

We can guarantee the shortest distance between design and delivery for you, too.



Avondale

For details, Contact:
Barry Heaps
Avondale Boat Division
Avondale Industries, Inc.
P.O. Box 50280
New Orleans, LA 70150-0280
Telephone: (504) 366-7298

An Employee Owned
And Operated Company

Air Ride 109 Passenger Ferry, designed by Air Craft, Inc.

Circle 271 on Reader Service Card

StartMaster Offers Free Literature On SM-250 Starters

The StartMaster Model SM-250 has a design that features a choice of built-in lubrication, relay valve and muffler. This reduces the hose and fittings required by nearly 50 percent, saving installation time and cost, and decreasing the potential for leaks in the air system. Complete application kits, including air tank, brackets, hose, fittings, and required accessories are available for truck and bus installations. The SM-250 is widely used on trucks, buses and other heavy vehicles and equipment.

The starter cranks diesel engines up to 1,800 cubic inches.

For further information and free literature on the Model SM-250 from StartMaster,

Circle 36 on Reader Service Card

PROPULSION UPDATE

Three Engines—One Design Concept: MAN B&W's State-Of-The-Art Propulsion Family For The 90s

In the near future, an optimally graded MAN B&W four-stroke engine program of state-of-the-art design will be available in the output range between 3,300 kw and 12,000 kw, equipped to meet the propulsion requirements of the 90s. The new family is comprised of three MAN B&W medium-speed engines, all modeled on the same design principles.

Beginning with the largest engine, the L58/64, MAN B&W has created an engine series for a class of top-rated engines designed with a view of achieving economy and reliability and equipped with every manner of future-orientated, technical and economical design characteristics.

With a piston diameter of 580 mm and a stroke of 640 mm, the L58/64 engine develops a cylinder output of 1,325 kw at a speed of 428 rpm, i.e., in the nine-cylinder version the engine is capable of an output of approximately 12,000 kw.

The "little brother," L40/54, which successfully completed its test bench trials at the end of 1987, with its cylinder output of 665 kw is modeled on the basic design concept of the L58/64 engine, an engine that has since proved itself in operation in numerous ships' propulsion plants. The first seven L40/54 engines will be supplied in early 1989.

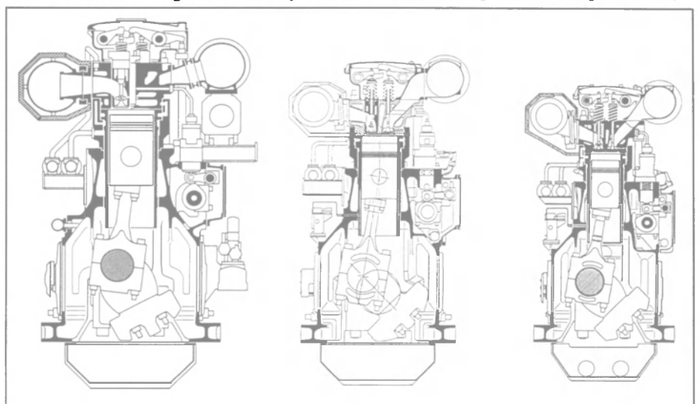
The L48/60 engine currently under development plugs the output gap between the 40/54 and the 58/64 with its 885-kw per cylinder at a speed of 450 rpm. This engine was also modeled on the same future-orientated design concept.

All three engines are supplied as in-line configuration engines with between six and nine cylinders.

The principle design features of the MAN B&W medium-speed engine generation include:

Very stiff, monoblock frame casing; underslung crankshaft; individual cylinder jackets, resulting in minimum deformation from gas and mass forces and thermal influences; connecting rod—optimized marine head design with parting line in the upper region of the rod shaft, i.e., extremely low overhauling height; exhaust valves arranged in cages resulting in simplified maintenance of components.

Also, propellers on the exhaust valve cones, resulting in rotation of the valve by the gas flow—valve seats remain free of deposits over many thousands of operating hours; fuel-optimized injection system with "economy plunger" and high-injection intensity; adjusting mechanism for optimizing the injection timing during engine operation; constant pressure turbocharging, i.e., higher turbocharger efficiency and low component temperatures;



L58/64 L48/60 L40/54

Profiles of the three medium-speed MAN B&W engines, all modeled on the same design principles.

TECHNICAL DATA

Engine type	40/54	48/60	58/64
Cylinder bore	400 mm	480 mm	580 mm
Piston stroke	540 mm	600 mm	640 mm
No. of cylinders	6,7,8,9	6,7,8,9	6,7,8,9
Cylinder output	665 kw	885 kw	1325 kw
Speed	514 1/min	450 1/min	428 1/min
Mean piston speed	9.25 m/s	9.0 m/s	9.1 m/s
Mean effective pressure	22.9 bar	21.7 bar	21.9 bar
Fuel consumption at 85% ECR	172 g/kWh	169 g/kWh	167 g/kWh

←Circle 279 on Reader Service Card

high compression ratio and correspondingly adjusted valve timing for problem-free and trouble-free HFO operation; consistently even exhaust gas temperature after turbine over a broad operating range ensures optimum utilization of waste heat.

MAN B&W's exhaust gas turbocharger with a very high level of aggregate efficiency over the entire load range permits a part of the exhaust gas flow to be branched off and utilized in a turbo-compound system, thus raising the aggregate efficiency of the propulsion plant; resilient mounting of the engines—the rigid design makes it possible to arrange the resilient bearing elements directly on the engine lands.

Low maintenance requirement thanks to an optimized maintenance concept: with only three different hydraulic tools, all the main screw connections can be slackened and re-tightened; rocker arm covers can be opened without great physical exertion and fix themselves in the open position; and the design and arrangement of the rocker arms makes for swift and simple removal of the exhaust valves.

According to MAN B&W, their new generation of medium-speed engines offer further reductions in fuel consumption rates (85% ECR): L40/54—172 b/kWh, L48/60—169 g/kWh, and L58/64—167 g/kWh; lube oil consumption rates of less than 1 g/kWh; significant reductions in pollutant emission levels; extensive utilization of various engine waste heats, resulting in a high aggregate efficiency of the propulsion system; long wear component lifetime and thus a low spare parts requirement; a simple maintenance concept tailored to the practice of day-to-day engine operation ensures short maintenance and turnaround times, which in turn means high engine availability and reduced manning levels.

For more information and free literature on MAN B&W engines,

Circle 16 on Reader Service Card

MAN B&W Holeby's CODAG GenSet Is Said To Save Up To 50 Percent In Electricity Production Costs

MAN B&W Holeby reports savings of 50 percent or more in shipboard electricity production costs are possible from the CODAG (combined diesel and gas) GenSet system developed by company. The concept represents one of the most significant advances ever made in improving the economy and operational flexibility of marine auxiliary power generation plants.

The system neatly blends a power turbine in a tandem arrangement with an auxiliary generating set driven by a heavy fuel-burning diesel engine from Holeby's market-leading type 23 and 28 design portfolios. The incorporation of the company's patented Integrated Charge Air System (ICS) allows the auxiliary diesel to operate continuously on heavy fuel at all loads from full power down to and including idling.

The power turbine is supplied with surplus exhaust gas bypassed from the main engine's turbocharger(s), and the ICS feeds charge air from the main engine to supplement the auxiliary engine turbocharger's effort.

It is the well-proven ICS which makes it possible for the "free of charge" energy of a turbocompound system to be exploited in a power turbine arranged to contribute the main drive for the CODAG GenSet. The associated auxiliary diesel engine will normally run near the idling condition, only injecting a minor driving force to the set sufficient to act as a speed governor controlling the frequency of the electrical grid.

For additional information and free literature on MAN B&W Holeby's CODAG GenSet,

Circle 14 on Reader Service Card

Contract With $4.6-Million Potential Awarded Bender For Dredge Overhaul

Bender Shipbuilding & Repair Co., Inc., Mobile, Ala., was recently awarded a contract for the regular overhaul, repair and alteration of the dredge Wheeler, a 408-foot seagoing hopper dredge with a complement of 64 and onboard crew of 32, operated by the New Orleans district of the U.S. Army Corps of Engineers.

Bender is expected to perform the work in 45 days, employing 150 workers. The base contract amount is approximately $2,500,000, with additional optional work totaling another $2,100,000.

Bender is a full-service shipyard in operation for 60 years. It builds, converts and repairs vessels for commercial and governmental owners and operators.

For free literature giving full details on the facilities and capabilities of Bender Shipbuilding,

Circle 41 on Reader Service Card

Seacoast Electric Offers Reprint Of Training Manual

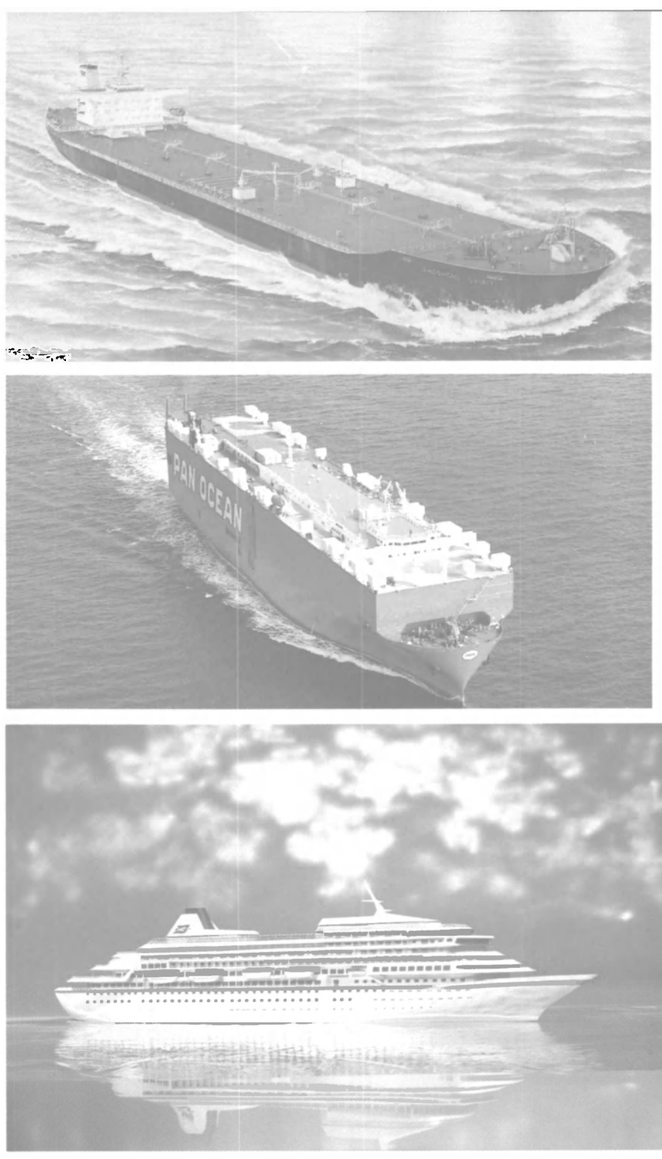
Due to favorable response, Seacoast Electric Supply Corporation of Passaic, N.J., has reprinted their Training Manual, which the company says is the only complete information and reference guide in the shipboard cable and marine electrical equipment industry.

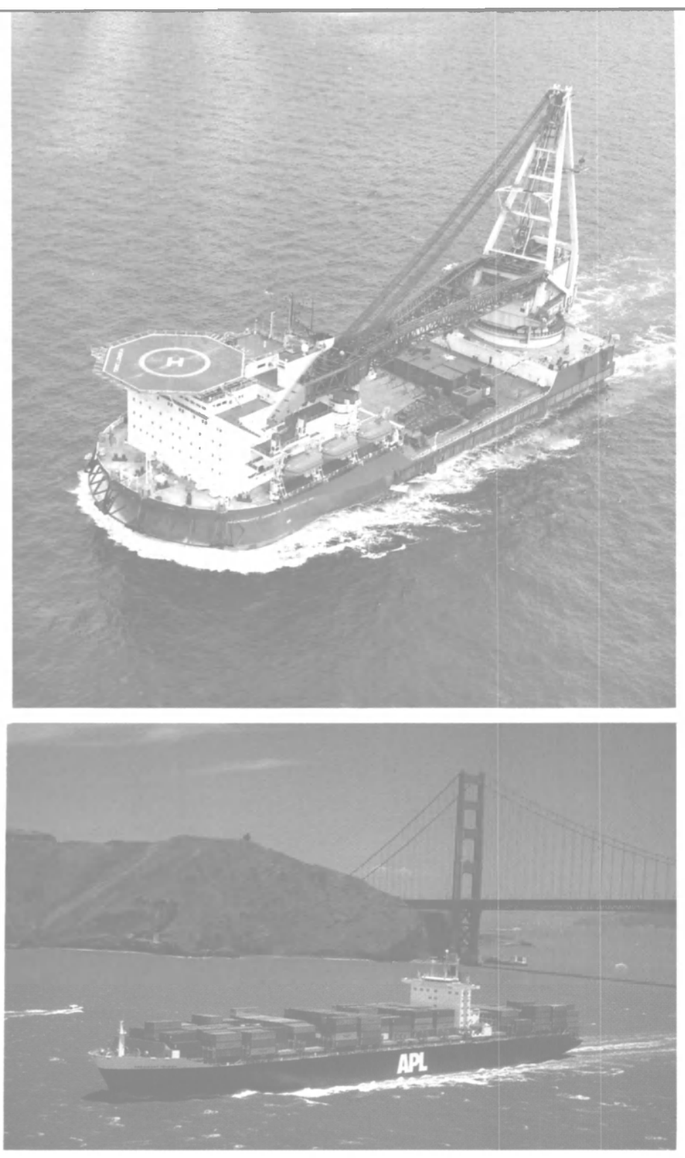
The Training Manual has been designed to further educate Seacoast's staff and customers, and to give all a better understanding and working knowledge of the products which are worked with each day. The Manual is particularly useful when used in conjunction with Seacoast's catalog.

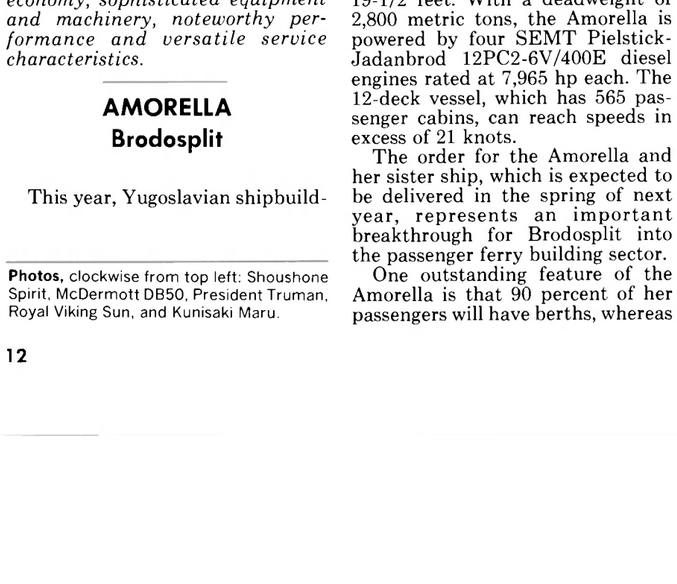
Seacoast also offers training seminars to customers, which can be held at Seacoast's locations or at customers' facilities. All the new shipboard cable specifications will be covered.

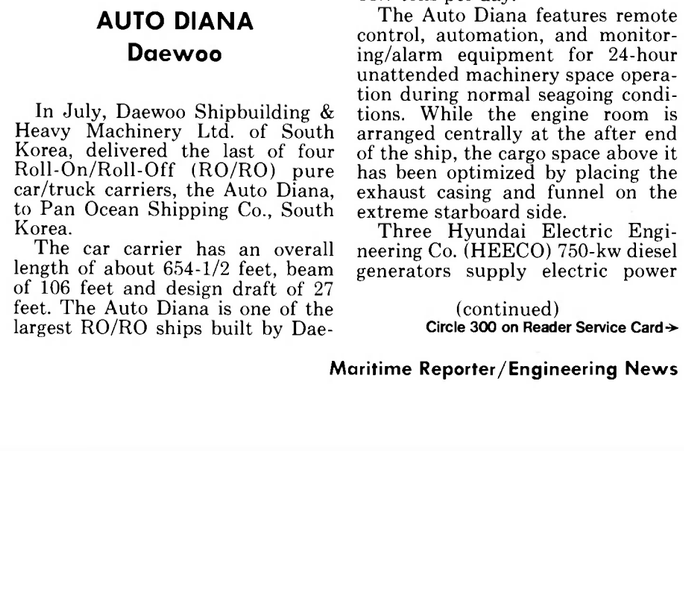
For further information and a free copy of the Training Manual from Seacoast Electric Supply,

Circle 60 on Reader Service Card









OUTSTANDING OCEANGOING SHIPS OF 1988

MARITIME REPORTER's annual feature "Outstanding Oceangoing Ships of 1988" is a review of some of the most notable oceangoing commercial vessels constructed during the year by some of the world's most technologically advanced shipyards. The newbuildings have been selected by the editorial staff of MR/EN on the basis of their outstanding designs, excellent fuel economy, sophisticated equipment and machinery, noteworthy performance and versatile service characteristics.

AMORELLA
Brodosplit

This year, Yugoslavian shipbuilder Brodosplit delivered the 37,500-gt Amorella, the first of two new generation Baltic cruise ferries, to owners SF Line for operation by Viking Line on the Turku-Mariehamn-Stockholm service route.

The 2,200-passenger-capacity ferry, which also can accommodate 620 cars/53 trucks, has an overall length of 555-1/2 feet, breadth of 90-1/2 feet, depth of 28 feet and draft of 19-1/2 feet. With a deadweight of 2,800 metric tons, the Amorella is powered by four SEMT Pielstick-Jadanbrod 12PC2-6V/400E diesel engines rated at 7,965 hp each. The 12-deck vessel, which has 565 passenger cabins, can reach speeds in excess of 21 knots.

The order for the Amorella and her sister ship, which is expected to be delivered in the spring of next year, represents an important breakthrough for Brodosplit into the passenger ferry building sector.

One outstanding feature of the Amorella is that 90 percent of her passengers will have berths, whereas current generation Baltic ferries on the route provide only about 60 percent of the passengers with berths.

The outfitting of the Amorella's public spaces was subcontracted to Danish company Aalborg Vaerft.

The Amorella is expected to replace the 1980-built Rosella.

AUTO DIANA
Daewoo

In July, Daewoo Shipbuilding & Heavy Machinery Ltd. of South Korea, delivered the last of four Roll-On/Roll-Off (RO/RO) pure car/truck carriers, the Auto Diana, to Pan Ocean Shipping Co., South Korea.

The car carrier has an overall length of about 654-1/2 feet, beam of 106 feet and design draft of 27 feet. The Auto Diana is one of the largest RO/RO ships built by Daewoo, with a capacity of about 5,800 standard car units.

Propulsion is provided by a single MAN B&W-KHIC 6S60MC diesel engine with a maximum output of 12,840 bhp at 102 rpm, driving a fixed pitch propeller manufactured by Hyundai Engine & Machinery Co. (HEMCO). Her service speed is 18 knots and fuel consumption is 33.7 tons per day.

The Auto Diana features remote control, automation, and monitoring/alarm equipment for 24-hour unattended machinery space operation during normal seagoing conditions. While the engine room is arranged centrally at the after end of the ship, the cargo space above it has been optimized by placing the exhaust casing and funnel on the extreme starboard side.

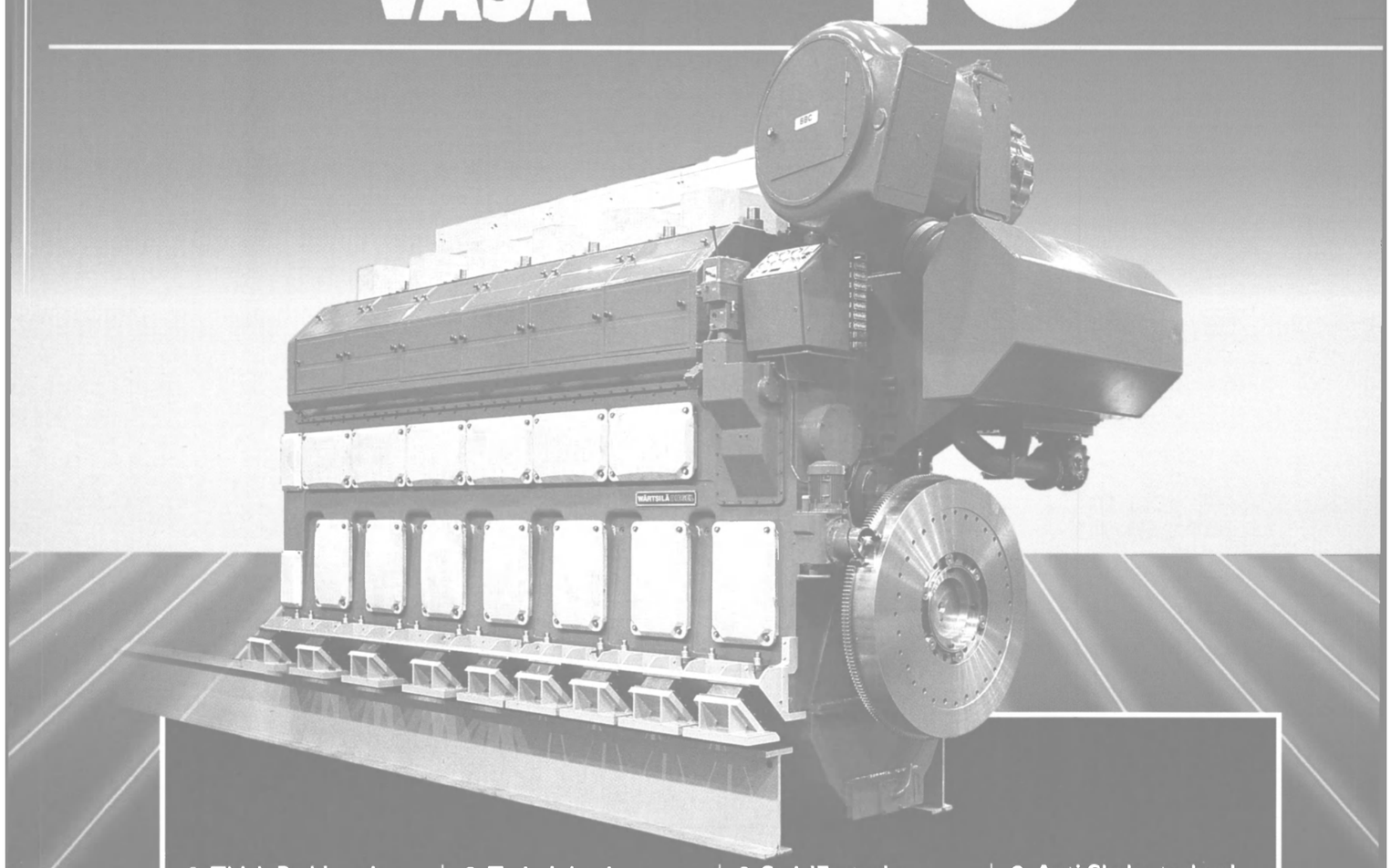
Three Hyundai Electric Engineering Co. (HEECO) 750-kw diesel generators supply electric power

(continued)

Photos, clockwise from top left: Shoushone Spirit, McDermott DB50, President Truman, Royal Viking Sun, and Kunisaki Maru.

THE REALLY RELIABLE ENGINE

WÄRTSILÄ VASA 46



- Thick-Pad bearing technology is the revolutionary concept for bearing reliability.
- Twin injection ensures the lowest fuel consumption and reliable combustion on really heavy fuels.
- SwirlEx turbocharging provides for reliable low-load performance and low fuel consumption.
- Anti-Shake technology incorporates rigid engine structure, full balancing and an option for resilient mounting. All make for onboard comfort.

WÄRTSILÄ DIESEL

Production plants in Finland, Sweden, Norway, France, Spain and Singapore

Wartsila Diesel, Inc.
81 Holly Hill Lane – 2nd Floor
Greenwich, Connecticut 06830
Tel. (203) 661-4132
Tlx. 147074 wdi ct
Telecopier (203) 661-4174

Wartsila Diesel, Inc.
5132 Taravella Road,
Marrero (New Orleans), LA 70072
Tel. (504) 341-7201
Tlx. 810-951-6386 wartsila marr
Telecopier (504) 341-0426

and 100-kw generator is additionally installed for emergency. For better harbor maneuverability, a Lips bowthruster driven by a 950-kw electric motor has been installed. The wheelhouse is arranged forward to improve visibility.

Steam is produced by an Osaka oil-fired boiler. With the main engine running at normal load while at sea, steam is generated by an Osaka exhaust gas boiler.

Extensive model tests and studies led to the improved and innovative design of the 13-car deck carrier. The Auto Diana's design includes two liftable decks, car deck space divided into five compartments by transverse bulkheads and gas-tight decks.

One quarter stern ramp and side ramps located at amidships are designed and arranged to offer operational flexibility for vehicle carrying service. More specifically, the stern ramp and No. 7 deck are both strengthened for bulldozer transportation. For easier car loading, one center line pilla system is installed, as well as a double spiral internal ramp way system.

The fundamental design concept for the Auto Diana class ships is to obtain high cargo capacity, easy operation, good flexibility and high reliability.

AUTO DIANA
Equipment List

Main engine	MAN B&W-KHIC
Propeller	HEMCO
Bowthruster	Lips
Steering gear	Dong Myeong
Engine control console	Korea-Taiyo
Generator engine	MAN B&W-Ssangyong
Generator	HEECO
Emergency generator	Ssangyong
Auxiliary boiler	Osaka
Main switchboard	Korea-Taiyo
Incinerator	Dae Jin
Freshwater generator	Sasakura
Anchor	Kiyomoto
Lifeboats	Hyundai
Deck machinery	Fukushima
Radar	Krupp Atlas Elektronik
Navigator	Racal Decca
Gyrocompass/autopilot	TKC
Loading computer	MECA
Echo sounder/speed log	Furuno
RO/RO equipment	MacGregor FE
Movable deck lifter	Susan HI
Car lashing fitting	DHMC
Cargo hold vent fan/motor	O-Yang
CO_2 fire system	John-Kerr

CGM LA PEROUSE
Samsung

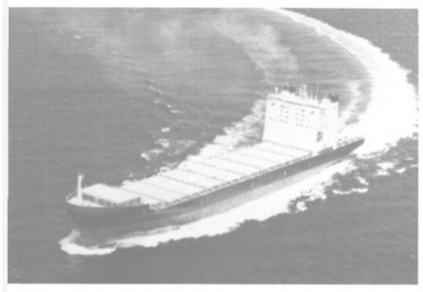
In September, Samsung Shipbuilding & Heavy Industries Co., Ltd., of South Korea, delivered the 2,525-TEU advanced containership CGM La Perouse for use in the Europe/Australasia trade.

With an overall length of 750.3 feet, molded breadth of 105.6 feet, molded depth of 61.6 feet and design draft of 34.4 feet, the CGM La Perouse is the mainstay of Compagnie Generale Maritime's participation in the Anzecs consortium. She was ordered from Samsung Heavy Industries about two years ago at a price of around $38 million. The 41,900-dwt cellular vessel sailed from the Koje Island yard crewed by a 17-man complement of French nationals. The crew will be reduced to 15 once all on board have become familiar with the complex control and monitoring systems.

Minimum crewing considerations and a drive for efficiency gains in every sector are reflected in the sophistication of the shipboard operating systems—and notably the extent which automation has been applied. The adoption of an optimized hull form, with an asymmetric afterbody and highly skewed propeller, helps towards the economy of the design. According to tests, her

CGM LA PEROUSE
Equipment List

Main engine	Sulzer
Generator engines	Wartsila
Alternators	HEECO
Main switchboard	HEECO
Navigation system	JRC
Doppler log	JRC
Engine telegraph	NABCO
Mode controls	Damatic
ARPA	Raytheon
Echo sounder	JRC
Radio telephone	Skanti
Handset	Sailor
Satnav	JRC
Navigator	Racal Decca
Heat exchangers	Alfa Laval
Freshwater generator	Alfa Laval
Preheaters	Sunrod
Compressors	Tanabe Pneumatic
Refrigeration	York
Ballast control system	Valmet



CGM La Perouse

asymmetric body shape may yield an energy savings of as much as 7 percent. The CGM La Perouse is reportedly the largest vessel ever built to have an asymmetric body design.

Efforts to apply restricted manning scales have been considerably helped by the dual certification system—in existence for some years in France—whereby watchkeeping officers are qualified in both deck and engineering disciplines.

The CGM La Perouse is powered by a seven-cylinder, two-stroke Sulzer 7RTA84 diesel engine built by Hyundai Engineering & Machinery Co. (HEMCO). The engine, which has the largest bore design of Sulzer's RTA family, has a rating of 28,500 bhp at 90 rpm. Daily fuel consumption is estimated to be 70.7 tons when the engine is operating at 24,650 bhp at 85.7 rpm. She is fitted with a highly skewed, fixed-pitch Stone Manganese propeller.

Electrical power is provided by two Wartsila-Ssangyong 4R32D diesel engines each driving a 1,350-kw HEECO alternator and two other six-cylinder engines driving two 2,000-kw HEECO alternators.

The CGM La Perouse is fitted with a Tokyo Keiki PR7000-type autopilot and two JRC M34 Series ARPAs. Navigation equipment also includes the JRC SNA-91 Total Navigation System.

CASTILLO DE BUTRON
Astilleros Espanoles

The Puerto Real yard of Spanish state-owned Astilleros Espanoles S.A. (AESA) delivered the outstanding bulk carrier Castron de Butron to her owners Empresa Nacional Elcano during 1988.

Classed by Lloyd's Register of Shipping, the 787-foot Castillo de Butron has a beam of 118 feet (which means she cannot navigate through the Panama Canal), maximum draft of 45 feet, trial speed of 14 knots, and estimated gross tonnage of 45,100 gt. She is powered by a new generation, long-stroke Sulzer-AESA 6RTA62 diesel engine rated at 14,940 hp at 102 rpm, which burns catalytic fuel oil. Electricity is supplied by two 725-kw generators driven by a 1,050-hp diesel engine at 720 rpm, one 725-kw generator driven by the main engine, and one 300-kw emergency generator driven by a 450-hp diesel engine at 1,000 rpm. Her auxiliary engines are designed to burn high viscosity fuel oil with the use of an oil-mixing system and sophisticated combustion system. She is fitted with raiseable and moveable "piggy-back" hatchway covers.

To conserve energy, the Castron de Butron's air conditioning system uses heat recovered from the main engine air coolers as a heat source.

Other state-of-the-art equipment and systems that have been incorporated into the Castron de Butron's design include: fixed cleaning systems for the holds; bilge draining systems with large alternating pumps; totally automatic design (Lloyd's Register of Shipping and Bureau Veritas rules); a self-polishing paint system on the hull and dry and floodable holds painted with epoxy pitch; an impressed cathodic protection system; and the latest navigation and communication systems.

CHARLES B. RENFREW
Mitsubishi

In August, Mitsubishi Heavy Industries, Ltd. (MHI) completed and delivered the Charles B. Renfrew, the second of a series of two 78,000-dwt lightering tankers for the Chev-

(continued)

ron Transport Corporation at its Nagasaki Shipyard.

The Charles B. Renfrew along with her sister ship, the R. Hal Dean, are used as lightering tankers for VLCCs and engaged in shuttle service between Pascagoula, Miss., and about 50 sea miles offshore in the Gulf of Mexico.

The Charles B. Renfrew has an overall length of 784-1/2 feet, molded breadth of 122 feet, molded depth of 58.3 feet and design draft of 36 feet. The 44,840-gross-ton vessel is powered by two MAN B&W-Mitsubishi 6L 52/55B diesel engines, with a maximum continuous rating of 6,700 hp at 450 rpm each.

Because she is fitted with a KaMeWa-Mitsubishi controllable pitch propeller, the operation of the Charles B. Renfrew is simple. The CP propeller makes it unnecessary to operate the main engines in the reverse mode and also allows the engines to be operated with a constant revolution.

Both the R.Hal Dean and Charles B. Renfrew feature energy and manpower saving equipment. For example, in order to improve efficiency and reliability of the lightering service, a lightering hose crane and fender davits have been installed. To improve operation in narrow seaways, both lightering tankers are equipped with bowthrusters and Schilling rudders. Another feature is a Mitsubishi Automated Cargo Control and Monitoring System, which cuts time during the vessel's frequent loading/unloading operations during shuttle service.

Amorella on sea trials.

For the monitoring of the main engine system, the vessel is provided with a monitoring system with a microcomputer which meets the ABS requirement for "unattended machinery space." An automatic operation control and monitoring system has also been used for the boiler and inert gas system and functions in connection with the automated cargo control and monitoring system.

As for navigation equipment, the vessel is equipped with a Decca Navigator which contains functions of the Loran-C, Omega and satellite navigation. Other equipment includes an automatic chart plotter connected to the Decca Navigator, a Navtex receiver, ARPA, doppler speedlog and docking sonar.

CROWN ODYSSEY
Meyer Werft

The luxurious 40,000-grt cruise

CROWN ODYSSEY
Equipment List

Main engines	Krupp MaK
Auxiliary engines	Krupp MaK
CP propeller	KaMeWa
Gears	Renk
Stabilizer	Ross
Stern tube bush and compact sealing	Ross
A.C. asynchronous motor	AEG
Radar	Krupp Atlas Elektronik
Radio equipment, hand radios, & facsimile receiver	Hagenuk
Automation system	Valmet Automation
Engine room console, switch gear & emergency lighting	Janssen
Monitoring & engine room control video systems	Siemens AG
Radio & TV system	Diskowski
A/C and ventilation systems	Rudolph Otto Meyer
Cooling plant	Brown Boveri-York
Loudspeaker, PA system, lighting & theater translating systems	Funa Nachrichtentecnik
Lamps, ceilings, panels & light fixtures	Dampa
Sewage treatment	Hamworthy
Couplings	Vulkan
Separators	Alfa Laval
Fresh water generator, potable water station, evaporating plants & heat exchanger	Serck
Bilge and ballast pump	Iron
Firefighting system	Preussaug
Fire alarm system	EB Nachrichtentechnik
Gas cylinder central station	Unitor
Welding rectifier	Unitor
Davits	Schat-Davit
Lifeboats	Fassmer
Pallet elevator	Macor Marine
Doors	Saajos
Hydraulically operated watertight door system	Schoenrock Hydraulik
Sound/heat insulation & flooring	Kaefer Isoliertecnik
Elevators & dumbwaiter	Otis
Electric anchoring & mooring equipment	Rauma Repola
Galleys, pantries & counters	Navalmar

ship Crown Odyssey was delivered by the Papenburg, West Germany, shipyard of Meyer Werft to Royal Cruise Line of Piraeus, Greece.

The 616-foot cruise ship has a molded breadth of 92-1/2 feet and draft on summer freeboard of 22.7 feet. She has 12 decks, and is able to carry 1,221 passengers in 526 cabins. The Crown Odyssey also has 199 crew cabins and a complement of 443.

The Crown Odyssey is powered by an innovative "father and son" four-engine plant consisting of two Krupp MaK 8M601 "father" engines with an output of 10,880 hp at 400 rpm each and two Krupp MaK 6M35 "son" engines, each developing 3,604 hp at 720 rpm. The plant produces a total of about 29,000 hp and a service speed of about 22 knots. The engine output is being transmitted via double reduction Renk gears with integrated lamella couplings to a KaMeWa controllable pitch propeller system. The main and auxiliary engines are designed to operate on heavy fuel oil IFO 600.

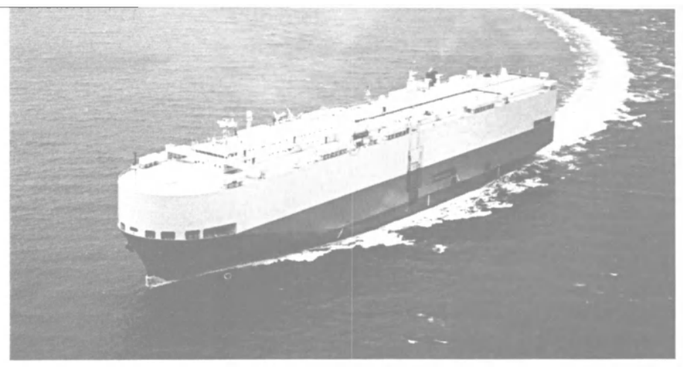
Electrical power is provided by four Krupp MaK diesel generating sets with a total generator capacity of 12,500 kva as well as one emergency generator with a capacity of 760 kva.

Two semi-spade rudders directly fitted behind the controllable pitch propeller and two bowthrusters ensure good maneuverability of the Crown Odyssey. Additionally, she is fitted with Ross Industrie stabilizers which reduce her roll motion by 90 percent at a speed of 17.5 knots.

On board the Crown Odyssey there are a total of 11 public rooms including the "Seven Continents Restaurant" on deck 6 which seats 640 persons. The other public spaces are situated on the Odyssey, Lido and Horizon decks (7th, 8th and 11th decks). The Monte Carlo Court, which is located on the Odyssey Deck, includes a casino, bar and several boutiques. Forward of this area there is the Odyssey Show Lounge with submergible stage and seating accommodation for 500 per-

(continued)

Photos—top Eternal Ace, bottom Kunisaki Maru



sons. Aft of the Court there is the Yacht Club, which has a 280-person capacity with an illuminated dance floor and an ample buffet.

The Crown Odyssey has a swimming pool on her 1st deck, as well as a fitness center, two saunas, two massage rooms, ample sun deck space and a beauty palour. She also has two whirlpools located on the Penthouse Deck (10th deck).

ETERNAL ACE
Mitsui Engineering

In April, the 5,563-vehicle capacity car carrier Eternal Ace was delivered by the Tamano Works of Mitsui Engineering & Shipbuilding Co., Ltd., to her Panamanian owners Perennial Motors Transport Inc.

The Eternal Ace has an overall length of 654.4 feet, breadth of 106 feet, molded depth of 110 feet and draft of 32 feet. The 55,380-gross-ton vessel is powered by a single MAN B&W-Mitsui 7S60MC diesel engine rated at 15,900 hp at 95 rpm. She has a maximum speed of over 21 knots.

To increase her vehicle-carrying capacity, the space between the Eternal Ace's deck above the mooring deck in the bow section and the No. 1 car deck has been enclosed. Additionally, two of her 14 stowage decks are movable to accommodate larger vehicles.

For more efficient mooring operation, the Eternal Ace is equipped with a bowthruster.

Classed by Nippon Kaiji Kyokai, the car carrier, which has a complement of 32, has a collision-prevention system as well as standard nautical equipment to insure safe navigation. She also is equipped with a satellite communication system for worldwide communication.

KUNISAKI MARU
Hitachi Zosen

In March, Hitachi Zosen's Ariake Works delivered the large ore carrier Kunisaki Maru to her owners Friend Shipping.

The 227,960-dwt ore carrier has an overall length of 1,033 feet, breadth of 170-1/2 feet, depth of 77 feet, and full load draft of 59 feet. The 110,039-gross ton Kunisaki Maru is powered by a single MAN B&W-Hitachi Zosen 8S70MC diesel engine that has an maximum continuous output of 23,000 hp at 88 rpm. The engine is designed to permit the use of low-grade fuel oil up to 6,000 sec Redwood. She has a speed of about 16 knots.

Besides her energy-efficient main engine, the Kunisaki Maru incorporates a number of fuel-saving features including: a Hitachi-Zosen-developed HZ nozzle for improved propulsion efficiency; a Hitachi Zosen-developed echo turbo-generator plant, ETC-2 system; and self-cleaning antifouling paint used to reduce drag and maintenance.

Classed by the Japanese classification society NK, the Kunisaki Maru's cargo-handling and mooring equipment as well as automated engine room facilities are engineered to save manpower and energy. She is crewed by a complement of 26.

MCDERMOTT DERRICK BARGE 50 NESL

MCDERMOTT DB 50
Equipment List

Alternator engines (5)	Allen
Alternators (5)	Brush Electrical
Dynamic positioning system	GEC
CP thrusters	Stone Vickers
Gyrocompass	Sperry
Dual axis doppler log	Sperry
Radar equipment	Kelvin Hughes
Motion suppression & crane comprensation system	BPP Ocean Technology
Echo sounders	Simrad
Radio equipment	STC International
Magnetic compass	B. Cooke
Whistles	Chadburn Engineering
Navigation systems	Racal Decca
Revolving crane	Clyde Iron
Anchors	Delta Flipper
Anchor winches & capstans	ASEA-Hagglunds
Air compressors	Compair Reavell
Engine room pumps	Hamworthy
Oil purifiers	Westfalia Separators
Incinerator	Hamworthy Engineering
Sewage treatment	Hamworthy Engineering
O/W separator	Hamworthy Engineering
Vacuum sewage system	IFO Sanitar RRC
Reverse osmosis plants	Caird & Rayner
Fire pumps & monitors	Weir Pumps
A/C & ventilation	Flakt
Anchor wires & mooring ropes	British Ropes
Halon systems	Walter Kidde
Fire detection & sprinkler systems	Hartnell Alarm
Mooring winches	Hagglunds
Lifeboats	Watercraft

The world's largest monohull crane vessel, McDermott Marine Construction's new McDermott Derrick Barge 50, has entered service in the Gulf of Mexico after undergoing final outfitting at McDermott Shipyard in New Orleans, La. The crane ship was built by British Shipbuilders subsidiary North East Shipbuilders Ltd. (NESL) at the firm's North Sands, Sunderland, yard.

A self-propelled dynamically positioned monohull vessel, DB 50 is designed for worldwide operation in a variety of marine construction roles. She is 495 feet long and 151 feet wide with a depth from keel to main deck of 41 feet.

The ship's main revolving crane is a Clyde Model 80-262-49-33. Its components include a fully active computerized motion suppression and heel compensation system. The crane has a 344.5-foot boom with the main block at 262.5 feet. It is mounted on an 80-foot diameter tub at the centerline aft of the vessel. At full revolving, it has a rated capacity of 3,527 short tons at 82 feet. Her slewing capacity over the stern is 4,189 short tons at a 100-foot radius. The Clyde crane has a fixed rating over the stern of 4,400 short tons at 121-foot radius.

Five 2,700-kw, 6,600-V, three-phase, 60-cycle Brush Electrical Machines alternators powered by five Allen Model S37 nine-cylinder heavy-fuel diesel engines provide ample power for the vessel's propulsion, dynamic positioning and crane. Each of the four main vertical-drive Brush Electrical propulsion motors drives a Stone Vickers azimuth thruster with an MCR of 2,400 kw at 880 rpm. Dynamic positioning is controlled by a GEC Uni-Control Duplex DP System rated for all modes of construction work, including DP diving operations. A GEC Tams 80 mooring system mon-

itors position and anchor lines and has computer-assisted thruster control. She can reach speeds of 11 knots.

The firefighting capacity of the DB 50 consists of four fire monitors located on the main crane mast. Each monitor is capable of sending a 7,900 gpm stream of seawater to a point 500 feet away to a maximum height of 230 feet. The ability to provide such a great volume of water, coupled with the mobility supplied by the dynamic positioning system, allows the DB 50 to furnish excellent firefighting capability to the Gulf of Mexico.

For pile driving, the vessel is outfitted with a Johnston 2,000-hp diesel-fired boiler capable of producing 69,000-pounds of steam an hour at 250 psi. The boiler capacity is sufficient to operate the largest pile driving hammers in use, including the Vulcan 6300.

Living quarters on DB 50 are equipped to accommodate 237 people. All quarters are centrally heated and air conditioned. Lounges, cinema, game rooms and gymnasium are provided for off-duty personnel. One dining room, one cafeteria-style galley and complete laundry and hospital facilities are provided. Ample offices and a conference room are allocated for customers.

She has a deck area of 30,000 square feet and a cargo capacity of 20,000 tons.

McDermott is leasing the ship from Lombard Initial Leasing Ltd., which purchased the vessel from British Shipbuilders.

MICOPERI 7000
Fincantieri-CNI

Fincantieri Cantieri Navali Italiani SpA's Montefalcone shipyard in Trieste, Italy, achieved an important milestone when it delivered reportedly the world's largest semi-submersible crane vessel, the Micoperi 7000, to her owners Micoperi SpA of Milan.

The Micoperi 7000 has two hulls, each with a length of 541 feet and a beam of 108 feet, supporting a 574 by 285-foot platform. From her line of construction, she has a freshwater docking draft of 32 feet, a transit draft of 34.4 feet, an operational light load draft of 65.6 feet, and an operational maximum heavy load draft of 94.1 feet.

MICOPERI 7000
Equipment List

Main engines (10)	GMT
Alternators	Ansaldo
Azimuth thrusters	Schottel/Lips
Revolving cranes	American Hoist
Winches	Pusnes
Electric system, automation, dynamic positioning	Ansaldo
Steel cables	Scanrope
Anchors & chains	Cadenas y Forjados
Purifiers	Alfa Laval
Volumetric fuel meter	ITT
Butterfly valves	Vanessa
A/C	Aerimpianti
Remote level gages & remote valve controls	Navalimpianti
Diving system	Dras
Pumps	Termomeccanica Italiani
Ventilation	Limoli

The self-propelled barge's propulsion and electrical needs are supplied by a total of 10 medium-speed Grandi Motori Trieste (GMT) diesel engines—eight 12-cylinder GMT A420 engines and two six-cylinder GMT A420 units. The eight 12-cylinder engines each drive an Ansaldo 60Hz, 10kv alternator rated at 5,600 kw for use at sea. For port use, two 2,800 kw alternators are driven by the two GMT six-cylinder diesels. All engines produce a total output of 55.62 MW or 75,570 bhp. The Micoperi 7000 is also equipped with an emergency 1,100-kw generator driven by a GMT eight-cylinder BL230 engine rated at 1,300 kw (1,766 bhp).

She features two bow-mounted 7,000-lifting-capacity America Hoist swivel cranes built under license by Officine Mecchaniche Reggiane of Italy.

Dynamic positioning and maneuvering is provided eight azimuth thrusters with fixed blades and propeller nozzle and two transverse tunnel thrusters with fixed blades placed in the forward area. Propulsion is ensured by the use of four non-retractable fixed-blade azimuthal propellers arranged astern.

The Micoperi 7000 can accommodate a crew of 800 in five suites with dayrooms, 35 single berth, 335 double berth and 30 triple berth cabins. She has two dining rooms, a swim-

(continued)

ming pool, theater, lounges, library and gym.

The Micoperi 7000 can be used in a variety of operations including the moving and installation of offshore oil drilling platforms. The crane barge is equipped with a sophisticated computer-controlled Kongsberg Albatross dynamic positioning systems and an automatic ballast system.

NILS DACKE
Schichau Seebeckwerft

Schichau Seebeckwerft AG of Bremerhaven, West Germany, delivered the world's largest railway/freight ferry, the 581-foot Nils Dacke, to Rederi AB Swedcarrier, the pool-partner of Hamburg-based TT-Line.

The Nils Dacke, with a molded breadth of 84-1/2 feet, draft of about 20 feet, tonnage of about 24,000 and deadweight of 7,800 tons, is powered by two main propulsion plants consisting of four MAN B&W main engines. Each main propulsion plant consists of a MAN B&W 6L40/45 diesel, with an output of 3,170 kw at 524 rpm, and a MAN B&W 8L40/45 diesel engine, with an output of 4,230 kw at 524 rpm. The total power for the two main propulsion plants (all four engines) is 14,800 kw. For maneuverability, the vessel is equipped with Lips variable pitch propellers and Frydenbo rudder plants. She has a service speed of about 18 knots.

The all-around combicarrier entered service on the TT-Line route between Travemunde and Trelleborg, Sweden. Her three decks are interconnected by internal ramps, and she load and discharge via a stern ramp.

The lower deck, or combi deck, is equipped with 910 meters of rail length distributed on six tracks, allowing for the transportation of 36 long-type railway wagons or 75 rail wagons of average size.

On the two upper decks, there is space for about 100 trucks/trailers. When not in use for rail cargo, the lower deck can accommodate an additional 60 trucks/trailers.

Furthermore, the Nils Dacke will have accommodations for 300 passengers in 122 cabins, a restaurant, lounge/bar, cinema and conference rooms. The crew complement will be about 40.

NORTH KING
J.J. Sietas

This year, the West German shipbuilder J.J. Sietas delivered the 3,056-dwt RO/RO vessel North King to Antares Shipping of London.

The 1,905-gross-ton ship has an overall length of 275-1/2 feet, breadth of 52-1/2 feet, summer draft of 17-1/2 feet and container capacity of 219 TEUs. Her bulk cargo capacity is 3,920 m^3 and bale cargo capacity is 3,770 m^3. Her propulsion power is provided by a Wartsila Vasa 6R32D diesel engine with an mcr of 1,676 hp at 750 rpm. The main engine is fitted with a BBC VTR304 exhaust gas turbocharger. Other propulsion equipment includes a Renk Tacke reduction gear and a Lips four-bladed controllable-pitch propeller.

Electrical power is supplied by a shaft generator rated at 360 kw. Additional power is supplied by three generators driven by Caterpillar 34508 DITA diesel engines.

For maneuverability, the North King is fitted with a Sietas flap Schilling rudder, as well as a Jastram bowthruster. The Jastram thruster is rated at 300 kw.

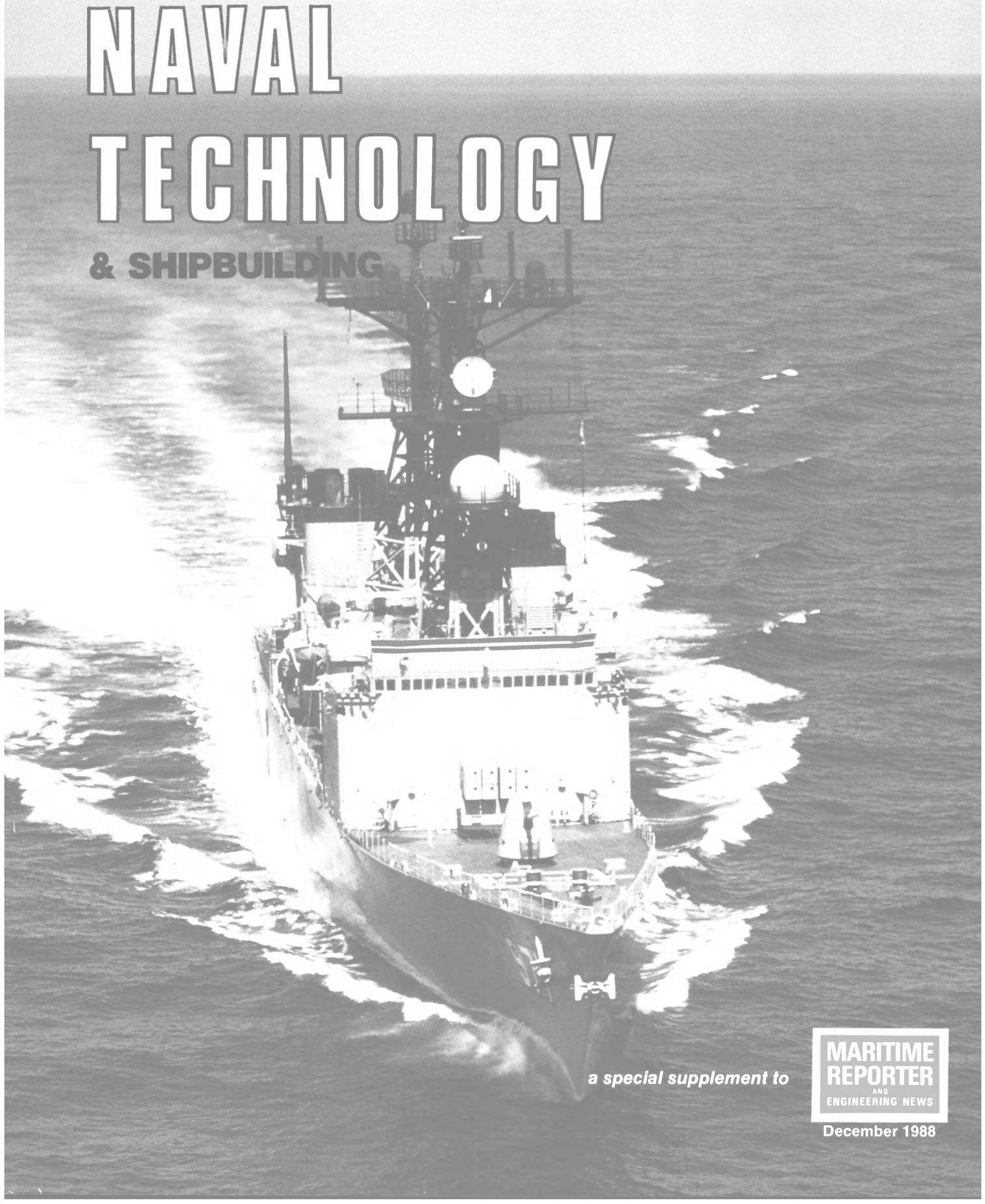
Four watertight tranverse bulk-

(continued on page 41)

NORTH KING
Equipment List

Main engine	Wartsila Vasa
Generator engines	Caterpillar
Emergency generator	KHD/Hansa
Propeller	Lips
Bowthruster	Jastram
Engine monitoring	Noris
Turbochrager	BBC
Radar	Sperry
Communications	Sailor
Deck cranes	NMF
Lifer rafts	RFD
Incinerator	Sunflame
Evaporator	Serck
Purifiers	Westfalia
Deck machinery	Steen
A/C	Flakt

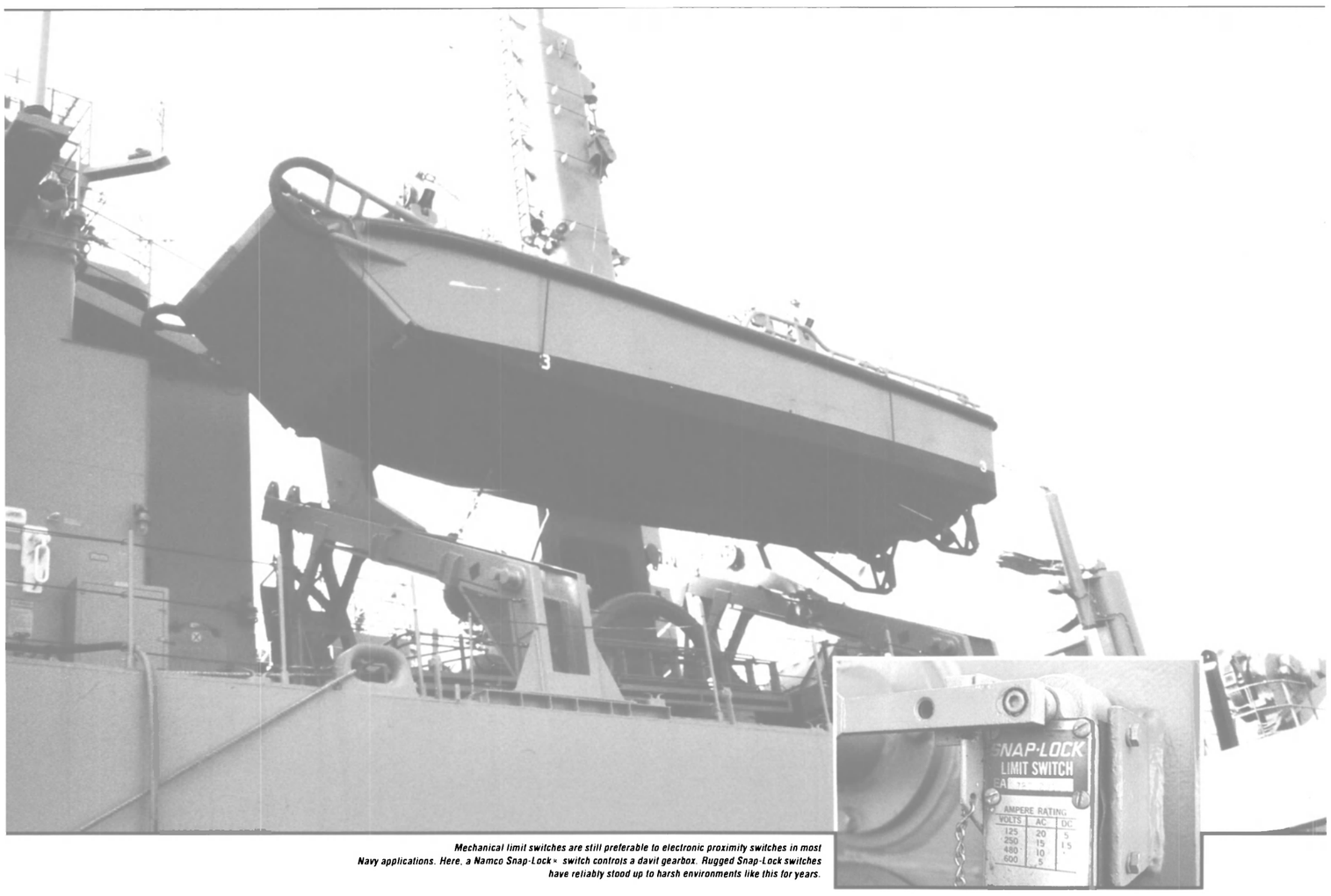
NAVAL TECHNOLOGY & SHIPBUILDING



a special supplement to

MARITIME REPORTER AND ENGINEERING NEWS

December 1988



Mechanical limit switches are still preferable to electronic proximity switches in most Navy applications. Here, a Namco Snap-Lock® switch controls a davit gearbox. Rugged Snap-Lock switches have reliably stood up to harsh environments like this for years.

"Are Limit Switches Too 'Old Fashioned' For Today's Navy?"

Not By a Long Shot.

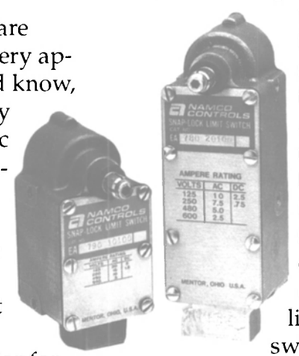
Here's Why...

Electronic sensors are great...but not for every application. We should know, since we make nearly all kinds of electronic and electro-mechanical switches, including proximity, photoelectric, fiber optic and laser sensors.

We also make limit switches, which, in our mind, are superior for Navy and marine tasks.

Why Limit Switches?

Most importantly, our limit switches are proven rugged and reliable. Right now, we've got thousands on the seas. All are made by Namco, the only supplier of nuclear qualified limit switches to the U.S. nuclear industry and Navy.



Additionally, our switches meet MIL-C-2212...just try to find a proximity switch that can.

Finally, our limit switches are "seaman-friendly." By that we mean repairable at sea, if necessary. Unfortunately, electronic switches cannot be fixed...just discarded.

All in all, knowing what mechanical and electronic switches can and can't do, we recommend mechanical limit switches for most Navy and marine uses. Call us, we'll be happy to show you more!

NAMCO

Mechanical Switches Are Best For Navy Use

- Meet MIL-C-2212
- Wide temperature operating range: -40°C to 150°C
- Nuclear qualified, including radiation
- High shock and vibration resistant
- Non-corroding and rust-resistant materials throughout
- Most performance for least dollars
- Carry high voltage and current
- Self-cleaning sliding contact or butt contact versions
- Submersible and watertight
- No special protection needed for RFI/EMI environments
- Multiple contacts, so that one switch can operate more than one system

Call or write for our Navy/Marine Switch Selector catalog.

NAMCO

Namco Controls, *An Acme-Cleveland Company, 7567 Tyler Blvd., Mentor, OH 44060, In Ohio (216) 946-9900, Telex: 24-1566*

Circle 30 on Reader Service Card

$29.4-BILLION FY89 NAVY BUDGET APPROVED FOR SHIPS AND EQUIPMENT

STATUS REPORT ON U.S. NAVY PROGRAMS FOR SHIP PROCUREMENT AND MAINTENANCE

By James R. McCaul, President
International Maritime Associates, Inc.

Construction and maintenance of the U.S. Navy ships continues to be the dominant source of business for shipyards in the United States. It is also a major source of business for marine equipment and electronics systems manufacturers. This article provides an update on the status of the U.S. Navy programs.

FY 1989 Budget

Congress appropriated $282 billion for defense spending in FY 1989. This figure is an increase of $3 billion over FY 1988 and $1 billion less than the President's request last February. Separate legislation was passed to authorize military programs. This is the first time in several years that the defense budget has been approved prior to beginning the new fiscal year.

The Navy represents 33 percent of the total defense budget for FY 1989. This compares with 36 percent in FY 1988—when full funding for two carriers was provided.

Photo: City of Portland, Maine, fireboat provides a water salute as the U.S. Navy guided missile frigate USS Samuel B. Roberts (FFG-58) is towed toward a berth at Bath Iron Works Overhaul & Repair Yard. The ship, damaged when it struck a mine in the Persian Gulf earlier this year, is expected to be tied up for 12 to 14 months. BIW photo by Deb Huston.

Ship and Equipment Procurement Budget Totals $29.4 Billion

The FY 1989 budget provides funding for four submarines, five Aegis destroyers, one amphibious assault ship, two minehunters, 12 support ships and 15 air cushion landing craft. Funding totaling $9.1 billion is provided for these acquisitions. Major beneficiaries of this spending will be Newport News (submarines), GD-Electric Boat (submarines), Litton-Ingalls and Bath Iron Works (Aegis destroyers),

Exhibit 2—Quantities of Major Shipboard Weapons Requested and Approved for FY 1989

	FY 1989 Program as Proposed in		Final Results	
	Jan. 1987	Feb. 1988	Authorized Sept. 1988	Approp. Sept. 1988
	number of units			
Missiles				
Trident II	66	66	66	66
Tomahawk	510	510	475	510
Standard	1635	1635	1310	1310
RAM	260	260	260	260
Harpoon	138	138	138	138
Torpodoes				
MK 48 ADCAP	350	261	261	320
MK 50 ALWT	224	140	140	140

Exhibit 1—Number of Ships Planned, Requested and Approved for FY 1989

	FY 1989 Program as Proposed in					Final Results	
	Feb. 1984	Feb. 1985	Feb. 1986	Jan. 1987	Feb. 1988	Authorized Sept. 1988	Approp. Sept. 1988
	number of units						
Submarines							
Trident	1	1	1	1	1	1	1
SSN 688	4	2	3	2	2	2	2
SSN 21	1	1	1	1	1	1	1
Surface Combatants							
CG 47	2	2	2	2	0[a]	0[a]	0[a]
DDG 51	5	5	3	3	3	3	5[b]
Amphibious Ships							
LHD 1	1	1	1	1	1	1	1
LSD 49	2	2	1	0	0	0	0
LPD (modernize)	3	3	1	0	0	0	0
LCAC	12	12	9	9	9	9	15
Mine Warfare							
MCM	0	0	0	0	0	0	0
MSH	4	4	4	0	0	0	0
MHC	0	0	0	2	2	2	2
Support Ships							
AR	1	0	0	0	0	0	0
AE	1	1	0	0	0	0	0
AOE	1	1	1	1	1	1	1
TAO	2	2	2	2	2	2	4
AO (convert)	2	2	1	2	2	2	2
TAGOS	0	0	2	3	3	3	3
AGOR	0	0	0	1	1	0	0
TACS (convert)	0	0	2	2	0	0	0

Notes: (a) two CG 47's planned for FY 1989 were shifted to and funded in FY 1988
(b) two additional DDG 51's are to be funded from prior year SCN savings

Exhibit 3—Top 100 Navy Contractors—FY 1988
($ in millions)

Rank	Company	Amount	Rank	Company	Amount
1	Newport News	$4,475.9	51	Southwest Marine	$73.2
2	General Dynamics/McDonnell Douglas	4,379.0	52	B.F. Goodrich	69.2
3	McDonnell Douglas	3,240.7	53	GTE	68.6
4	General Electric	2,957.4	54	Northrop	67.4
5	General Dynamics	2,809.8	55	Martin Marietta	66.3
6	Grumman	2,071.2	56	Scheduled Airlines Traffic Offices	66.2
7	Litton	1,812.2	57	Harris	65.7
8	Lockheed	1,811.4	58	Sperry	59.1
9	Raytheon	1,651.4	59	Vessel Charters	59.0
10	Hughes	1,117.1	60	Textron	58.8
11	Westinghouse	1,062.9	61	Ford	58.3
12	IBM	894.7	62	Taywood/Berg/Riedel	53.2
13	United Technologies	857.0	63	Simplex	51.4
14	RCA	755.5	64	AAI	51.2
15	Texas Instruments	680.2	65	Altantic Research	50.2
16	Boeing	637.9	66	Continental Maritime	46.2
17	Bell	634.1	67	Caddell	45.2
18	Johns Hopkins	394.5	68	Cassna	44.7
19	Rockwell	362.2	69	Northwest Marine	44.4
20	Avondale	339.9	70	Clearwater Construction	44.3
21	Unisys	294.9	71	Norden	43.5
22	Bath	277.1	72	Booz. Allen	43.3
23	Morton Thiokol	264.4	73	Automar I	43.2
24	Rolls-Royce	216.2	74	E-Systems	40.4
25	Singer	199.7	75	Kaman	39.4
26	AT&T	199.4	76	Charleston Naval Shipyard	39.2
27	Honeywell	195.2	77	Texaco	36.3
28	Tracor	175.1	78	OMI	36.2
29	ITT	154.7	79	Red River Shipping	35.4
30	General Motors	145.3	80	Centex Construction	34.9
31	FMC	142.9	81	Israel Aircraft	34.7
32	Vitro	138.4	82	TRW	33.9
33	Allied Signal	135.3	83	American Automar	33.2
34	Consolidated Elect. Countermeasures	114.0	84	CACI	32.2
35	Charles Stark Draper	111.0	85	DynCorp	31.5
36	EG&G	109.5	86	Halter	31.0
37	Sanders	95.2	87	Robert E. Derecktor	31.0
38	Magnavox	90.4	88	Pennsylvania State Univ.	30.8
39	Naval Aviation Depot	90.0	89	Maersk	29.1
40	Eaton	88.8	90	General Construction	28.7
41	Teledyne	87.1	91	MagneTek	28.6
42	Sparton	86.9	92	EDO	28.6
43	Loral	82.5	93	Hazeltine	28.5
44	Interstate Electronics	80.6	94	Actus	28.2
45	Central Gulf	80.2	95	Electronic Data	27.3
46	National Projects	79.6	96	Science Applications	27.2
47	Gould	78.9	97	Leon D. Dematteis	27.0
48	Hercules	77.4	98	College of Lake County	26.9
49	Williams International	76.3	99	Marquardt	26.9
50	Motorola	73.6	100	Vanguard Technologies	26.8

Source: IMA

U.S. NAVY

(continued)

Avondale (support ships and air cushion craft), Textron Marine (air cushion craft) and McDermott (minehunters).

More than $6.1 billion has been appropriated for procurement of weapon systems. This provides funding for 66 Trident II missiles, 510 Tomahawk missiles, 320 MK48 ADCAP torpedoes and 140 MK50 advanced lightweight torpedoes. Major beneficiaries of this funding are Lockheed (Trident II missile), General Dynamics and McDonnell Douglas (Tomahawk missile), Hughes and Westinghouse (MK48 ADCAP torpedo).

APPROVED FY89 NAVY BUDGET
($ in billions)

Program	$
Ships	$9.1 billion
Ship support & other support equip.	4.8
R & D	9.4
Weapons	6.1
Total	$29.4 billion

A total of $4.8 billion has been approved for procurement of ship support and other support equipment. Much of this equipment is earmarked for the fleet modernization program. A major beneficiary is General Electric (sonar upgrades).

Citing slippage in ship overhaul schedules, Congress cut $200 million from the budget request for equipment and systems earmarked for fleet modernization. Because of maintenance slippage attributable to shortage of O&M funds, equipment has been arriving at a faster rate than the pace of installation. Parts inventory has grown as a result. This cut is intended to bring inventory down to a more reasonable level.

The research and development budget is set at $9.4 billion. Among the major programs are the new submarine combat system, various antisubmarine warfare systems and the new SeaLance missile.

Quanities for ships and major weapon systems funded in FY 1989 are shown in Exhibits 1. and 2.

Ship Maintenance And Repair

Congress added $240 million to the Navy's budget request for ship modernization and maintenance. These additional funds are to be used for installing the VLS system in two Spruance destroyers and performing New Threat Upgrade overhauls on surface combatants during this year.

An additional $97 million was added to the budget to repair the frigate Samuel Roberts. This work is to be performed by Bath Iron Works.

FY 1988 Contracting Results

IMA maintains a database of contract awards by the Navy and other DoD agencies. It contains all contracts exceeding $3 million issued by any contracting office in the

Navy since 1984. Exhibit 3 is developed from this database—and shows the top 100 contractors to the Navy during the preceding fiscal year.

Major winners were Newport News (two aircraft carriers, submarines), General Dynamics (submarines, ATA aircraft, missiles), McDonnell Douglas (F-18 and ATA aircraft, missiles), General Electric (electronics, nuclear plants), Grumman (F-14, A-6 and E-2C aircraft), Litton (Aegis and LHD ships, electronics), Lockheed (Trident II missiles), Raytheon (electronics, missiles) and Hughes (torpedoes, missiles).

Long Term Outlook

The Navy views a shipbuilding program of about $11 billion per year as necessary to maintain the current force structure. This figure would support a building rate of 18 to 20 ships per year.

Fleet growth resulting from the recent build-up will generate on increasing flow of ship and ship systems maintenance and repair. Spending for this activity—including purchase of equipment and its installation—is projected to be an additional $10 billion annually.

Weapons procurement by the Navy will likely continue at a $6 billion to $6-1/2 billion level over the foreseeable future. Research and development will probably remain around $9 billion to $9-1/2 billion annually.

MAJOR NAVY CONTRACTS

The following special section highlights the latest U.S. Navy contract awards for shipbuilding, ship repair and maintenance, shipboard communications, weapons, etc. The section covers contracts awarded between July 13 and September 30, 1988. For contracts prior to these dates, refer to the Naval Technology & Shipbuilding Supplement in the September issue of MR/EN.

July 13

Ingalls Shipbuilding Incorporated, Pascagoula, Miss., was awarded a **$28,364,184** cost-plus-fixed-fee contract for lead yard services for CG-47 class cruisers. The work is expected to be completed June 30, 1989. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-2111).

July 15

Southwest Marine Incorporated, San Pedro Division, Terminal Island, Calif., was awarded a **$8,092,380** firm-fixed-price contract for regular overhaul for USS Knox (FF-1052). The work is expected to be completed in February 1989. The Supervisor of Shipbuilding, Conversion and Repair, Long Beach, Calif., is the contracting activity (N00024-85-H-8222).

Gould Incorporated/Granite State Joint Venture, Glen Burnie, Md., was awarded a **$11,118,327** firm-fixed-price contract for materials for the deployable array handling system. Work is being performed in Manchester, N.H. (31 percent), and Glen Burnie, Md. (69 percent), and is expected to be completed in June 1992. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-6124).

July 18

B.F Goodrich Company, Jacksonville, Fla., was awarded a **$55,646,502** firm-fixed-price contract for materials for Sonar Dome Rubber Window (SDRW) production. The work is expected to be completed March 31, 1988. The Naval Sea Systems

(continued)

U.S. NAVY

CURRENT NAVY & COAST GUARD VESSELS UNDER CONTRACT AT U.S. YARDS

(As of October 1988)

SHIPYARD Navy Designation	NAME	APPROX. CONTRACT $	EST. DELIVERY
Alabama Maritime Corporation			
YON (3) & YOS (2)	unnamed	6,955,046	4/90
Avondale Shipyards			
T-AO-187 Class (3)	unnamed	292,600,000	—
T-AO-194	John Ericsson	97,500,000	2/90
T-AO-196	Kanawha	95,025,000	11/90
T-AO-195	Leroy Grumman	101,000,000	5/89
T-AO-197	Pecos	100,633,789	3/90
T-AO-198	unnamed	109,600,000	9/91[8]
LSD-44	Gunston Hall	166,000,000	8/88
LSD-45	Comstock	153,400,000	2/89
LSD-46	Tortuga	153,400,000	4/89
LSD-47	Rushmore	150,000,000	11/89
LSD-48	Ashland	150,000,000	5/90
LSD-49	unnamed	157,400,000	11/93
Avondale—Gulfport Marine Division			
LCAC (7)	unnamed	115,586,281	—
LCAC	—	31,759,154[6]	90
Bath Iron Works			
CG-58	Philippine Sea	252,800,000	1/89
CG-60	Normandy	191,800,000	9/89
CG-61	Monterrey	191,800,000	12/89
CG-63	Cowpens	193,300,000	4/90
CG-64	Gettysburg	193,300,000	11/90
CG-67	Shiloh	236,041,276	4/92
CG-70	unnamed	226,123,977	6/93
DDG-51	Arleigh Burke	321,000,000	7/90
DDG-53	John Paul Jones	189,900,000	7/92
DDG-51 Class	—	22,600,000[1]	5/92
DDG-51 Class	—	23,100,000[1]	5/89
Bethlehem-Sparrows Point			
T-AGS-40	Tanner	66,000,000	2/89
Bollinger Shipyard			
WPB (16)	unnamed	99,306,516	2/90
General Dynamics-Electric Boat			
SSN-752	Pasadena	280,100,000	10/88
SSN-754	Topeka	324,500,000	2/89
SSN-755	Miami	324,500,000	6/89
SSN-757	Alexandria	283,000,000	10/89
SSN-760	Annapolis	258,166,750	2/90
SSN-761	Springfield	258,166,750	6/90
SSN-762	Columbus	258,166,750	10/90
SSN-763	Santa Fe	258,166,750	2/91
SSN-770	unnamed	347,400,000	4/93
SSBN-738-740	—	42,000,000	12/93[3]
SSN-21 Class	—	28,900,000[3]	—
SSBN-734	Tennessee	523,700,000	12/88
SSBN-735	Pennsylvania	531,600,000	8/89
SSBN-736	West Virginia	500,870,000	4/90
SSBN-737	Kentucky	616,400,000	12/90
SSBN-738	Maryland	674,100,000	12/91
SSBN-739	Nebraska	615,000,000	12/92
SSBN-740	unnamed	644,000,000	7/94
SSBN-734 Class	—	48,400,000[3]	12/88
SSBN-741 Class	unnamed	617,400,000	10/94
Halter Marine			
T-AGOS-14	Worthy	14,250,000	12/88
T-AGOS-15	Titan	13,844,067	3/89
T-AGOS-16	Capable	14,031,914	7/89
T-AGOS-17	Intrepid	14,031,914	11/89
T-AGOS-18	Relentless	14,031,914	3/90
T-AGOR-23	unnamed	20,900,000	12/89
Ingalls Shipbuilding			
CG-59	Princeton	325,500,000	10/88
CG-62	Chancellorsville	238,600,000	6/89
CG-65	Chosin	242,600,000	11/90
CG-66	Hue City	193,980,662	10/91
CG-68	Anzio	163,980,664	4/92
CG-69, 71, 72 & 73	unnamed	769,142,667	1/94
CG-47 Class	—	215,982,000[6]	1/94
CG-47 Class	—	44,128,775[5]	—
CG-47 Class	—	3,608,809[6]	10/89
CG-47 Class	—	28,364,184[1]	6/89
DDG-52	John Barry	162,149,000	9/91
LHD-1	Wasp	1,365,700,000	3/89
LHD-2	Essex	402,494,000	4/92
LHD-3	Kearsage	378,685,000[4]	1/93
LHD-4	unnamed	341,400,000	4/94
DD-963 & DDG-993 Class	—	14,100,000[1]	3/93
Intermarine USA			
MHC-51	Osprey	20,926,936	4/91
Lockheed-Savannah			
LCUs (Army-12)	unnamed	—	7/88-11/89
Marinette Marine			
MCM-4	Champion	42,000,000	12/88
MCM-7	Patriot	51,848,816	10/89
McDermott Inc.			
SWATH T-AGOS-19	Victorious	25,424,347	2/90
SWATH T-AGOS (3)	unnamed	61,700,000	10/91
YTT 9 & 10	unnamed	21,700,000	10-11/89
YTT 11	unnamed	10,913,817	5/90
NASSCO			
AOE-6	Supply	290,097,944	4/91
Newport News Shipbuilding			
CVN-72	Abraham Lincoln	1,550,000,000	12/89
CVN-73	George Washington	1,550,000,000	12/91
CVN-74	John C. Stennis	3,700,000,000	96
CVN-75	unnamed		98
SSN-688 Class	—	22,000,000[1]	10/88
SSN-753	Albany	319,000,000	7/89
SSN-756	Scranton	259,833,000	9/89
SSN-758	Asheville	259,833,333	1/90
SSN-759	Jefferson City	259,833,333	6/90
SSN-760	unnamed	55,000,000[6]	—
SSN-764	unnamed	257,118,500	2/91
SSN-765	unnamed	257,118,500	5/91
SSN-766	unnamed	257,118,500	8/91
SSN-767	unnamed	257,118,500	11/91
SSN-688 Class (2)	unnamed	612,000,000	—
SSN-21 Class	Sea Wolf	325,000,000[7]	2/94
SSN-21 Class	—	28,900,003[3]	—
Pennsylvania Shipbuilding			
T-AO-191	Benjamin Isherwood	111,000,000	10/88
T-AO-192	Henry Eckford	111,000,000	5/89
Peterson Builders			
MCM-5	Guardian	57,900,000	6/89
MCM-6	Devastator	48,287,461	8/89
MCM-8	Scout	48,287,461	6/90
Robert E. Derecktor Shipyard			
WMEC-912	Legare	30,160,000	5/89
WMEC-913	Mohawk	30,160,000	5/89
TB (Army-2)	unnamed	16,500,000	89
Tacoma Boatbuilding			
T-AGOS-11	Audacious	9,295,000	6/89
T-AGOS-12	Bold	9,295,000	10/89
Textron Marine			
LCAC-13-24 (12)	unnamed	187,000,000	89/-6/91
Todd Pacific-San Pedro			
FFG-61	Ingraham	96,100,000	11/88

Footnotes: 1. Lead yard services contract; 2. Engineering and technical services contract. 3. Design contract; 4. Contains $26 million for advanced procurement of material for LHD-4; 5. Yard planning services; 6. Long lead procurement; 7. Detail design contract; 8. Contains options for one T-AO in FYs 89, 90 & 91.

KEY TO NAVY DESIGNATIONS

AOE	Fast Combat Support Ship	LCU	Landing Craft, Utility	SSN	Submarine, Nuclear	WPB	Patrol Boat†
CG	Guided Missile Cruiser	LHD	Amphibious Transport Dock	T-AGOS	Ocean Surveillance Ship*	YON	Fuel Oil Barge
CVN	Aircraft Carrier, Nuclear	LSD	Dock Landing Ship	T-AGS	Surveying Ship*	YOS	Oil Storage Barge
DDG	Guided Missile Destroyer	MCM	Mine Countermeasures Ship	T-AO	Oiler*	YTT	Torpedo Test Craft
FFG	Guided Missile Frigate	MHC	Mine Hunter, Coastal	TB	Tugboat		
LCAC	Landing Craft, Air Cushion	SSBN	Ballistic Missile Sub, Nuclear	WMEC	Medium Endurance Cutter†		

*Assigned to Military Sealift Command
†Coast Guard

Major Navy Contracts

(continued)

Command, Washington, D.C., is the contracting activity (N00024-88-C-6019).

July 19

Raytheon Company, Equipment Division, Wayland, Mass., was awarded a **$5,916,540** cost-plus-fixed-fee contract for Tartar design agent engineering support for the MK-74 Missile Fire Control System (MFCS). The work is expected to be completed December 31, 1989. This contract combines purchases for the U.S. Navy (42.5 percent) and the governments of Japan (8.7 percent), Italy (33.4 percent), Australia (8.5 percent), and Taiwan (6.9 percent) under the Foreign Miltary Sales program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-5654).

July 22

Newport News Shipbuilding and Drydock Company, Newport News, Va., was awarded an **$18,011,186** firm-fixed-price contract for construction of three dry deck shelters. The work is expected to be completed in July 1991. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-5216).

July 25

Raytheon Company, Submarine Signal Division, Portsmouth, R.I., was awarded a **$12,281,069** modification to a previously awarded firm-fixed-price contract for spares for the AN/BSY-1(V) program. The work is expected to be completed in February 1991. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-86-C-6140).

July 26

Bath Iron Works, Bath, Maine, was awarded a **$3,998,653** modification to a previously awarded cost-plus-fixed-fee contract for the reconstruction of USS Samuel B. Roberts (FFG-58). The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-8520).

July 28

AT&T Technologies Incorporated, Greensboro, N.C. was awarded a **$17,551,509** firm-fixed-price contract for oceanographic equipment. Work will be performed in Greensboro, N.C. (93 percent), and Whippany, N.J. (7 percent), and is expected to be completed December 31, 1990. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-88-C-0136).

Robert E. Derecktor of R.I. Incorporated, Middleton, R.I., was awarded a **$14,460,174** modification to a previously awarded firm-fixed-price contract for two large tug boats for the U.S. Army. The work is expected to be completed in April 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-2136).

July 29

Alabama Maritime Corporation, Mobile, Ala., was awarded a **$6,955,046** firm-fixed-price contract for three fuel oil barges (YON) and two oil storage barges (YOS). The work is expected to be completed in April 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-2112).

EDO Incorporated, Government Systems Division, College Point, N.Y., was awarded a **$8,695,020** modification to a previously awarded firm-fixed-price contract for six AN/SQR-18A (V) 1 and 2 passive sensor systems for FF-1052 class ships. The work is expected to be completed in July 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-6154).

General Dynamics, Pomona Division, Pomona, Calif., was awarded a **$6,310,490** firm-fixed-price contract for delivery of various quantities of 15 repair parts in support of the Phalanx Close-in Weapon System. The work is expected to be completed in May 1991. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-88-C-2730).

Rockwell International, Autonetics Marine Systems Division, Anaheim, Calif., was issued a **$4,256,430** firm-fixed-price order to furnish 53 NSN 7H 1287-LL-HGO-0335 display assemblies in support of the AN/BSY-1 sonar system for shipboard use. The work is expected to be completed in May 1990. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-85-G-0370).

August 3

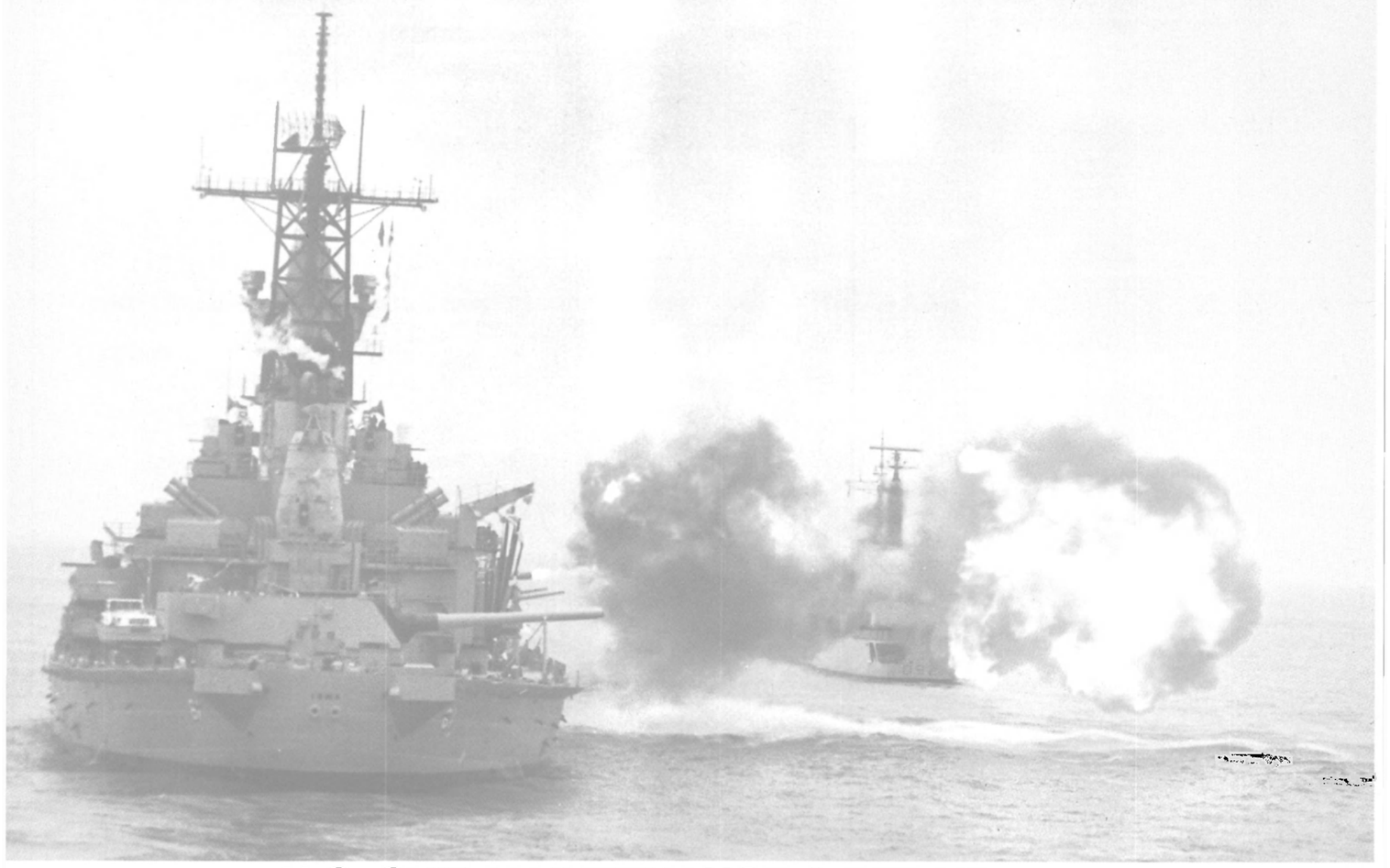
Rockwell International, Autonetics Marine Systems Division, Anaheim, Calif., was awarded a **$9,443,514** letter contract for seven Fast Time Analyzer Systems (FTAS) for aircraft carriers plus associated spares, data and training. The FTAS analyzes acoustic data from tapes collected from ASW aircraft. The work is expected to be completed January 30, 1992. The Space and Naval Warfare Systems Command, Washington, D.C., is the contracting activity (N00039-88-C-0172).

August 4

Honeywell Incorporated, Underseas Systems Division, Hopkins, Minn., was awarded a **$17,688,624** modification to a previously awarded firm-fixed-price contract for material and services for MK 46 torpedoes. The work is expected to be completed in August 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-6052).

Continental Maritime of San Francisco, San Francisco, Calif., was awarded a

(continued on page 34)



U.S. SHIP MAINTENANCE & REPAIR— A $50 BILLION TO $60 BILLION 10-YEAR MARKET

10-YEAR FORECAST OF BUSINESS OPPORTUNITIES IN U.S. NAVY SHIP MAINTENANCE AND REPAIR

By James R. McCaul, President
International Maritime Associates, Inc.

International Maritime Associates, Inc., (IMA), Washington, D.C., has just published a 280-page report which forecasts business opportunities in Navy ship maintenance from 1989 through 1998. It addresses the combatant fleet, Military Sealift Command (MSC) ships, Ready Reserve Force (RRF) ships and Navy service craft. The report also contains a database of contract awards for ship maintenance over the past four years.

It is the most comprehensive business analysis yet made of Navy ship maintenance and repair. The report will be a valuable long range planning tool for any firm involved in the marine and naval business sectors.

Photo: Baltic Sea - A stern view of the battleship Iowa (BB-61) conducting a gunnery demonstration.

Long Term Business Outlook

IMA's report separates future business opportunities into work (1) open to coastwide competition, (2) limited to homeport area shipyards, and (3) reserved for commercial nuclear-qualified or naval shipyards. The report forecasts job starts and expenditures in each of these categories over the next 10 years—the 10-year market could total between $50 billion and $60 billion. East/Gulf Coast yards could be awarded about 55 percent of this total—$27.5 billion to $33 billion, while West Coast yards could receive about 45 percent—$22.5 billion to $27.5 billion.

Coastwide overhauls—IMA projects approximately 200 overhauls will be open to competition by commercial shipyards over the next 10 years. About 55 percent will be on the East/Gulf Coasts, 45 percent on the Pacific Coast.

Captive area work—The report forecasts more than 1,700 short-term starts (less than six months duration) will be contracted to ship-repair firms over the next 10 years. This work will be reserved for firms in the homeport areas. About 55 percent of the captive work will be on the East/Gulf Coasts, 45 percent on the West Coast. Norfolk, Va., San Diego, Calif., Charleston, S.C., Mayport, Fla., and Long Beach, Calif., will account for 1,200 of the 1,700 short-term availabilities.

Reserved work—About 600 job starts are projected to be earmarked for the eight naval shipyards, three Navy-owned overseas ship-repair facilities, or the nuclear qualified submarine yards (Newport News and GD-Electric Boat).

Impact Of Technology Change

New naval ships are designed for extended intervals between overhauls. Emphasis is being placed on short, frequently scheduled periods during which repairs and maintenance are performed. This has major impact on the geographical distribution of work—as short term availabilities are generally reserved for ship-repair firms in the ship's homeport area.

Gas turbine propulsion will continue to replace steam turbine propulsion in surface ships. Over the next 10 years, 55 gas turbine-powered ships will enter service, while 58 steam-powered Navy ships are retired. Gas turbines require different maintenance than steam-powered plants. One result will be less work available to contractors who repair boilers and perform other work related to steam plants.

These are just a few of the technology changes impacting future ship maintenance which are described in IMA's report.

Exhibit 1—Five-Year History Of Ship Maintenance Awards By Ship Type
FY 1984-1988

	Ship	Type Work	Start Date	Completion	Contractor
AD 15	Prairie	DSRA	09/14/87	02/19/88	Southwest Mar. LA
AD 18	Sierra	DSRA	02/03/86	05/02/86	Metro Machine
AD 18	Sierra	DSRA	01/05/85	02/28/85	Metal Trades
AD 37	Samuel Gompers	DSRA	07/08/85	10/02/85	Todd SF
AD 38	Puget Sound	ROH	09/28/87	06/07/88	Norshipco
AD 38	Puget Sound	DSRA	03/27/86	06/12/86	Metro Machine
AD 41	Yellowstone	DSRA	01/07/85	03/19/85	Norshipco
AD 42	Acadia	DSRA	09/30/85	01/17/86	Southwest Mar. SD
AD 43	Cape Cod	DSRA	01/26/87	04/24/87	Campbell
AD 44	Shenandoah	DSRA	10/17/86	02/04/87	Bethlehem-SP
AE 21	Suribachi	SRA	01/28/87	04/28/87	G. Marine Diesel
AE 21	Suribachi	ROH	02/07/85	12/13/85	Coastal DD
AE 22	Mauna Kea	DSRA	09/29/86	02/07/87	CMI SF
AE 23	Nitro	PMA	01/14/86	05/01/86	Coastal DD
AE 23	Nitro	DSRA	09/15/87	03/04/88	G. Marine Diesel
AE 24	Pyro	DPMA	07/06/87	09/29/87	CMI SF
AE 24	Pyro	DPMA	03/03/86	07/01/86	Triple A
AE 25	Haleakala	ROH	06/28/84	04/30/85	Service Eng.
AE 27	Butte	PMF	04/18/88	09/09/88	G. Marine Diesel
AE 27	Butte	ROH	08/15/85	05/15/86	Alabama DD
AE 28	Santa Barbara	SRA	06/10/85	05/15/86	Braswell
AE 28	Santa Barbara	SRA	05/04/87	08/31/87	Metal Trades
AE 29	Mount Hood	PMA	02/10/88	05/11/88	Service Eng.
AE 29	Mount Hood	ROH	07/22/85	04/24/86	Todd SF
AE 32	Flint	DPMA	06/22/87	10/10/87	Service Eng.
AE 33	Shasta	PMA	03/24/86	06/20/86	Service Eng.
AE 33	Shasta	ROH	09/07/83	07/09/84	Triple A South
AE 33	Shasta	DPMA	06/06/88	10/03/88	Service Eng.
AE 34	Mount Baker	SRA	07/30/86	10/30/86	Metal Trades
AE 35	Kiska	PMA	08/19/85	11/15/85	Service Eng.
AE 35	Kiska	DPMA	10/12/87	02/08/88	Service Eng.
AFDM 7	Sustain	ROH	06/01/83	01/15/84	Norshipco
AFDM 10	Resolute	ROH	02/02/88	07/29/88	Norshipco
AFS 1	Mars	PMA	08/20/84	11/17/84	Todd SF
AFS 1	Mars	PMA	03/24/86	06/23/86	Todd SF
AFS 1	Mars	DPMF	01/19/88	05/17/88	CMI SF
AFS 2	Sylvania	PMA	08/15/84	11/16/84	Jonathan Corp.
AFS 2	Sylvania	PMA	05/05/87	08/05/87	Jonathan Corp.

Source: IMA, **U.S. Navy Ship Maintenance, Repair and Modernization,** October 1988.

Market Share Assessment

The report contains an extensive database of Navy and MSC ship maintenance over the past four years. Data are organized by company and by ship class. The user can quickly profile firms performing Navy ship maintenance and repair. Exhibit 1 is an excerpt from one of the tables showing ship maintenance awards organized by ship type.

A separate section provides tabulation of contract actions for ship and marine equipment maintenance and repair for each year from FY 1984 through FY 1988. The data show contract actions exceeding $25,000—including initial contracts and subsequent contract modifications. It provides a base of information for competitive analysis.

U.S. Navy Ship Maintenance, Repair and Modernization: A Ten Year Forecast of New Business and Appraisal of Market Share, published October 1988, is available for $550. To order, contact: International Maritime Associates, Inc., 835 New Hampshire Avenue, NW, Washington, D.C. 20037; telex: 64325 IMA; telefax: (202) 333-8504.

Bath Launches Aegis Cruiser Monterey

Bath Iron Works, Bath, Maine, recently launched the U.S. Navy Aegis guided missile cruiser USS Monterey (CG-61) at ceremonies at the shipyard.

She is the fourth Aegis cruiser launched by the Maine yard, which presently has seven of the vessels under contract. The ship is 567 feet in length, with a beam 55 feet. She is powered by four GE LM2500 gas turbines. The Monterey is scheduled to be commissioned in early 1990.

How does GE pack all the power of a heavyweight gear into a lightweight gear for the U.S. Navy?

"We surface harden it in America's only fully-automated nitride facility."

Paul Briere
Nitride Facility Operator
Lynn, Massachusetts

America's fighting ships. Space and weight are precious aboard them. The less that's devoted to propulsion systems—and the huge low speed gears that drive them—the more there is for weapons systems. GE understands this. That's why hardened and ground gears that drive Arleigh Burke destroyers pack as much power, and endure as much stress, as conventional units twice their size and weight. Reducing gear size and weight by 50% requires a special surface hardening process.

The One And Only

"There's only one fully automated gas nitride facility in the free world," Paul explains. "And it's here in Lynn. GE invested a million dollars to get it. Since it went into operation last April, we have already nitride-hardened a number of 'bull' gears for destroyers and submarines. It's amazing how huge the tank is... it will hold the largest Navy gear with room to spare."

Saves Time, Cost

"We used to send our bull gears out for surface-hardening," Paul continues. "But that took over eight weeks. In-plant nitriding takes a little over two weeks, gives us better control throughout the entire process and saves thousands of dollars in shipping costs. And our nitride facility is only the beginning. We're installing a state-of-the-art carburizing facility. When it goes on-line, we'll be able to batch run pinions and gears for the same propulsion system simultaneously, which will save the Navy even more time and money."

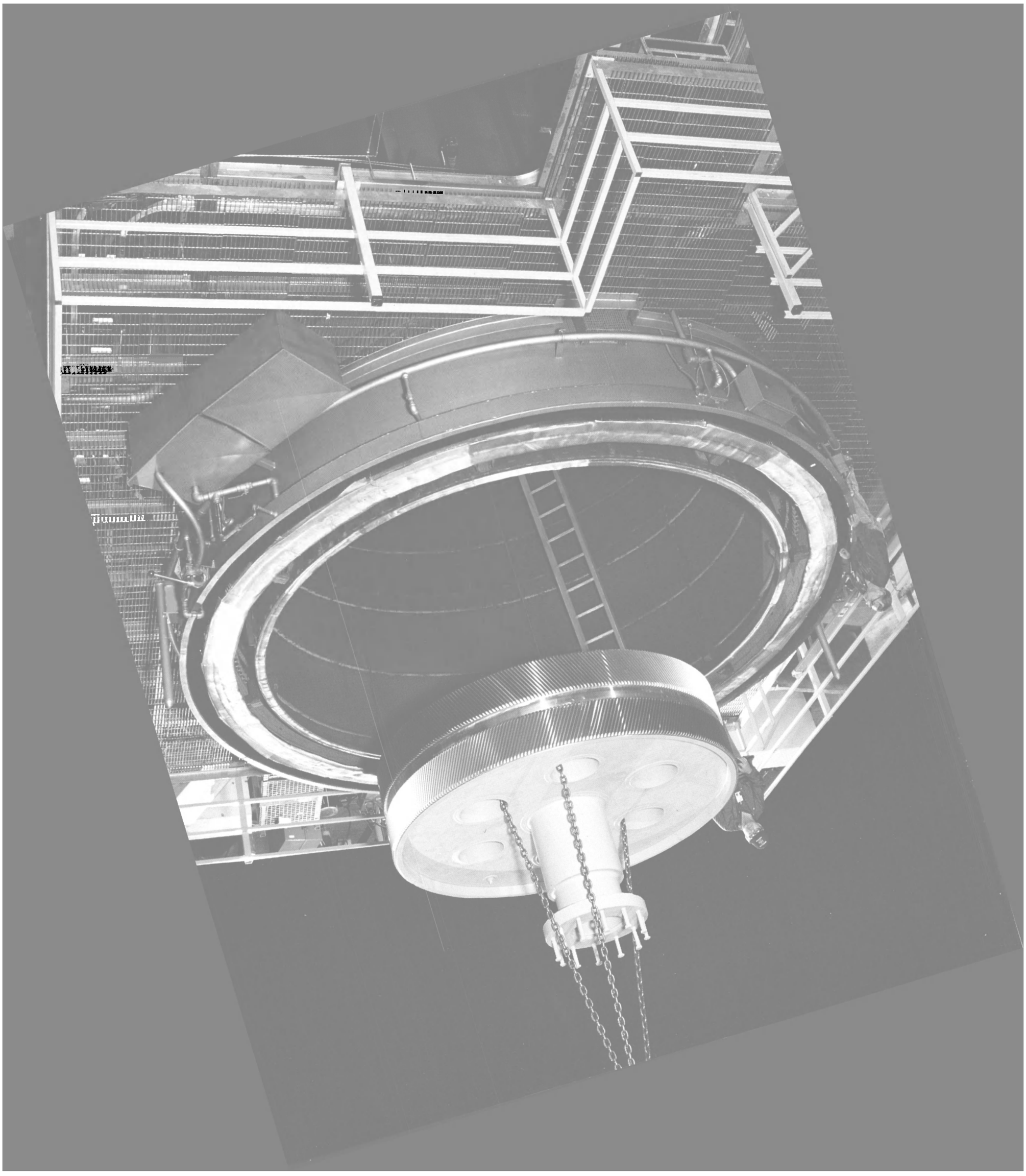
A Proud Tradition

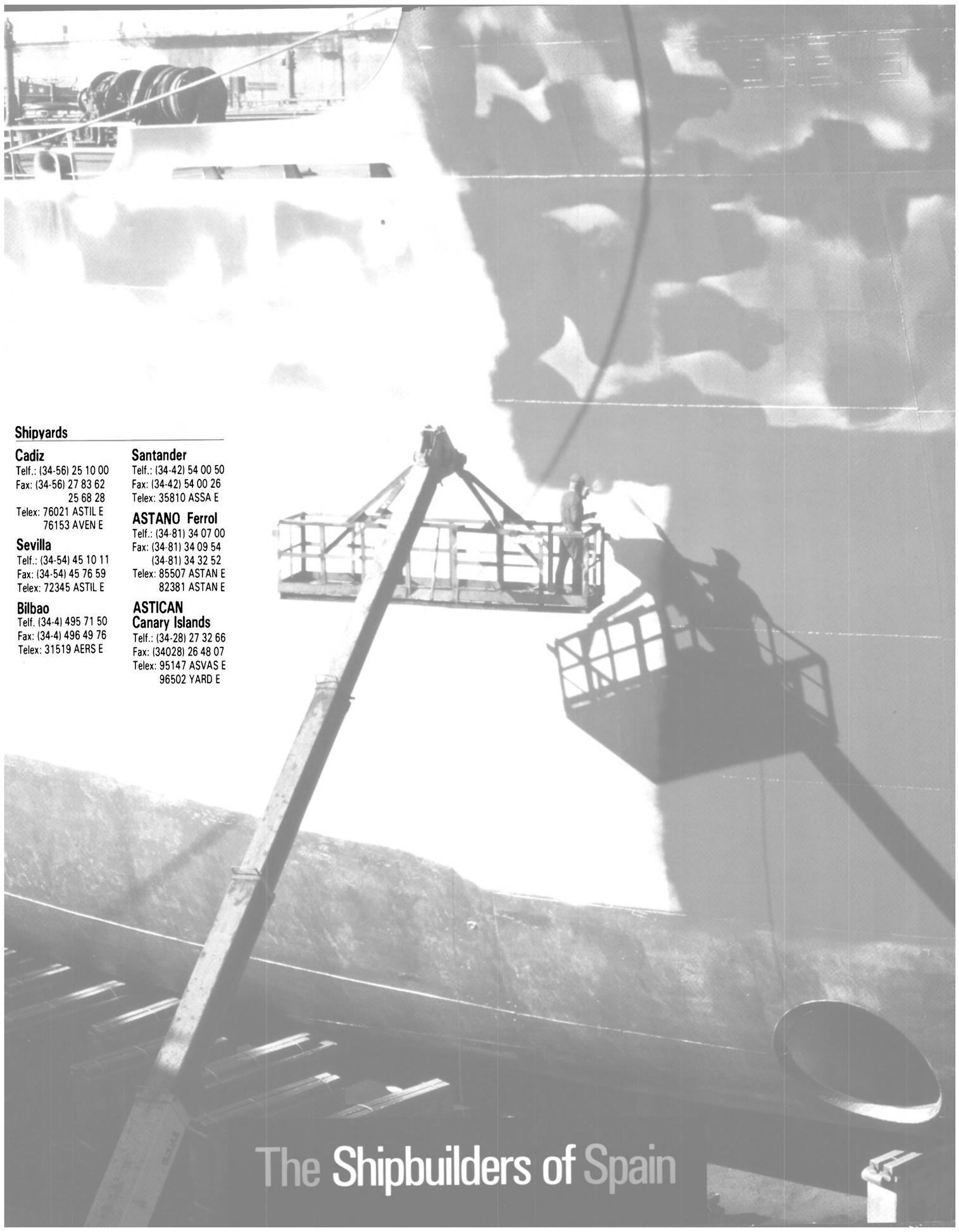
For 75 years, GE has served the Navy with unmatched engineering and manufacturing expertise, advanced technology and proven performance. This Proud Tradition of leadership continues today. Our new nitride facility is just one example of how GE has invested more than 25 million dollars to be sure Navy gearing for the 90's will be designed, manufactured and tested by the most advanced equipment in the world. With these facilities, committed GE people like Paul can carry-on the Company's commitment to be the principal supplier of Navy propulsion and ships service generator systems.

GE People:
Qualified, Committed, Proud

GE Naval & Drive Turbine Systems

Circle 35 on Reader Service Card





Shipyards

Cadiz
Telf.: (34-56) 25 10 00
Fax: (34-56) 27 83 62
25 68 28
Telex: 76021 ASTIL E
76153 AVEN E

Sevilla
Telf.: (34-54) 45 10 11
Fax: (34-54) 45 76 59
Telex: 72345 ASTIL E

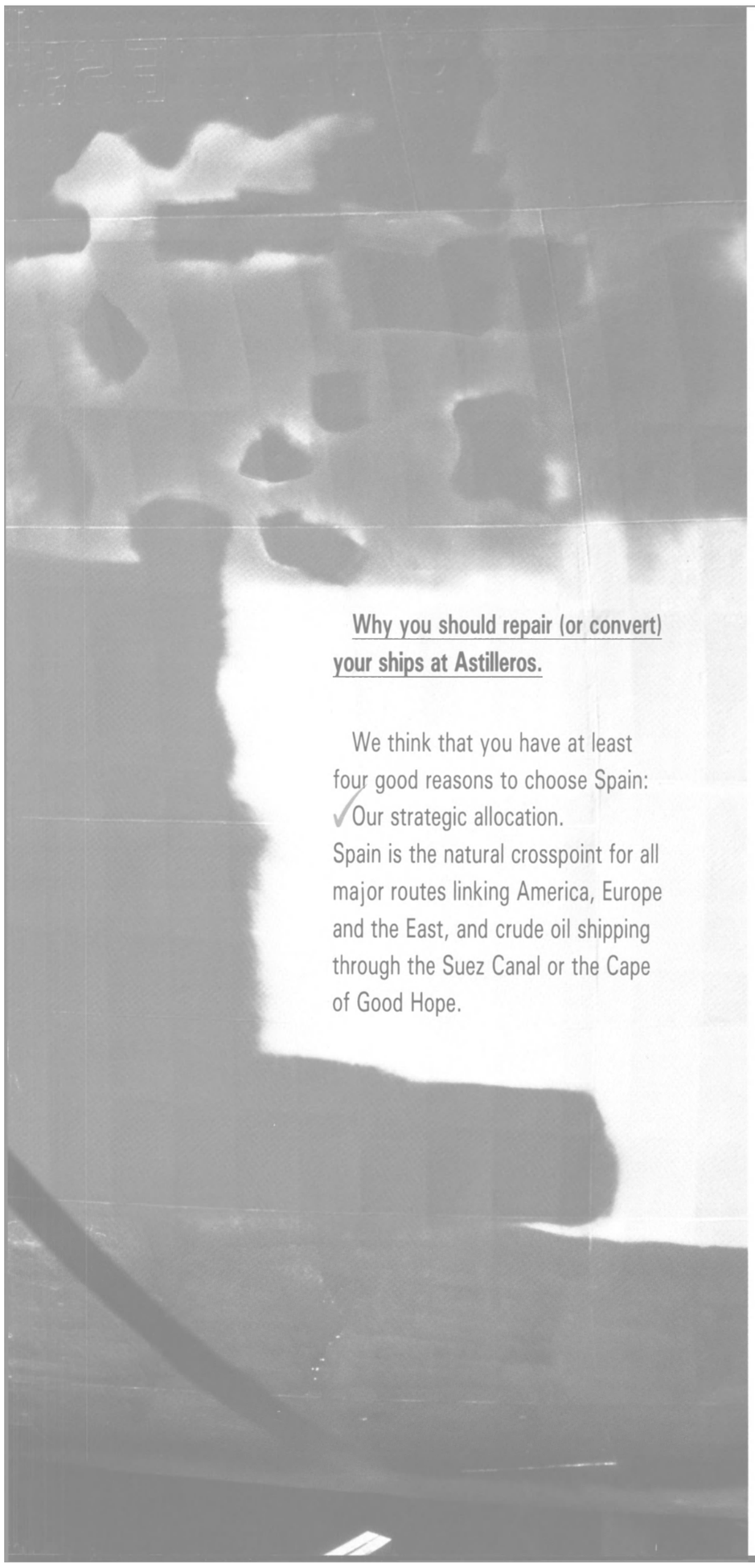
Bilbao
Telf. (34-4) 495 71 50
Fax: (34-4) 496 49 76
Telex: 31519 AERS E

Santander
Telf.: (34-42) 54 00 50
Fax: (34-42) 54 00 26
Telex: 35810 ASSA E

ASTANO Ferrol
Telf.: (34-81) 34 07 00
Fax: (34-81) 34 09 54
(34-81) 34 32 52
Telex: 85507 ASTAN E
82381 ASTAN E

ASTICAN
Canary Islands
Telf.: (34-28) 27 32 66
Fax: (34028) 26 48 07
Telex: 95147 ASVAS E
96502 YARD E

The Shipbuilders of Spain



Why you should repair (or convert) your ships at Astilleros.

We think that you have at least four good reasons to choose Spain:

✓Our strategic allocation.
Spain is the natural crosspoint for all major routes linking America, Europe and the East, and crude oil shipping through the Suez Canal or the Cape of Good Hope.

✓Our technical skills and facilities.
12 dry docks, 2 floating docks and one syncrolift, with capacities up to 400.000 d.w.t.

✓Our conversion experience
Ask for the facts. Astilleros has successfully converted all kinds of vessels (we have just delivered 3 chemical tankers for Gotaas Larsen, and our recent contracts include the conversion of a 21.000 dwt Bulkcarrier into a molten Sulphur carrier for Navimin). And Astilleros is a well known leader in FPSO and FSU and in Internal Blasting and Coating.

✓A spread of specialized yards.
Along the long coastline of Spain, and covering all tonnages.

✓And the Spanish weather...
Last but not least: an excellent climate means that work is rarely heald up by adverse weather.

As Astilleros offers, also, the best price and surprising financial packages, don't you think it's high time to check on us?

ASTILLEROS ESPAÑOLES ✓

For further information:
Astilleros Españoles, S.A.
Padilla, 17
28006 Madrid
Tel. (341) 435 78 40
Telex. 27648 ASTIL-E
Fax. (341) 276 29 56

Circle 184 on Reader Service Card

U.S. NAVY

CURRENT NAVY, COAST GUARD & MARAD OVERHAUL, REPAIR & CONVERSION CONTRACTS AT U.S. SHIPYARDS

(AS OF OCTOBER 1988)

SHIPYARD	SHIP	WORK	$VALUE	COMP.
Alabama Dry Dock	USS Lexington (AVT-16)	PM	10,131,466	8/90
Avondale Shipyards	USS Radford (DD-968)	ROH	20,700,000	5/89
	USS Merrimack (AO-179) & USS Willamette (AO-180)	CONV	52,100,000	5/93
	USNS Monongahela (AO-177) & USNS Cimarron (AO-178)	CONV	45,100,000	—-
Bath Iron Works	4 USCG cutters	ROH	117,452,000	89
	USS Samuel B. Roberts (FFG-58)	REP	27,300,000	11/89
			3,998,653	
Bay Shipbuilding	Mormactide (MarAd)	CONV	19,847,786	10/89
Bender Shipbuilding	Cape Farewell & Cape Flattery (MarAd)	REP	600,000	—-
	HLT-1	ROH & DD	400,000	—-
	SS Gulf Merchant, SS Gulf Banker, SS Gulf Trader & SS Gulf Shipper (MarAd)	REP & DD	—-	—-
Bethlehem Steel—Sparrows Point	USS Barney (DDG-6)	DSRA	3,305,013	1/89
Charleston Naval Yard	USS Andrew Jackson (SSBN-619)	OH	112,058,684	3/90
	USS Woodrow Wilson (SSBN-624)	OH	120,928,007	3/89
	USS Henry L. Stimson (SSBN-655) & USS Mariano J. Vallejo (SSBN-658)	REF	19,673,812	8/89
	USS Von Steuben (SSBN-632)	ERP	9,370,334	3/90
Continental Maritime	USS Lang (FF-1060)	PMA	3,200,000	10/88
	USS Rentz (FFG-46)	DSRA	4,400,000	12/88
	USS Enterprise (CVN-65)	SRA	6,855,930	3/89
	USS Ranger (CV-61)	REP	4,006,893	10/88
Jacksonville Shipyards	USNS Marshfield (T-AK-282) (MSC)	UPG	7,028,147	12/89
Jonathan Shipyard	USS Saginaw (LST-1188)	PM	9,900,000	6/90
Long Beach Naval Yard	LPH Class Ships	PM	8,096,132	10/90
Metro Machine	Atlantic Fleet LPDs	PM	5,334,400	8/91
	USS Bowen (FF-1079)	OH	6,900,000	—-
	USS Claude V. Ricketts (DDG-5)	DSRA	4,100,000	10/88
NASSCO	4 LSTs	PM	3,500,000	90
	3 LSTs	MAINT	5,858,543	—-
Newport News Shipbuilding	USS Newport News (SSN-750)	PSA	3,400,000	1/89
	Support Barge	REP	48,095,123	7/89
	USS Key West (SSN-722)	PSA	38,000,000	12/88
	USS George C. Marshall (SSBN-654)	REF	11,172,200	10/88
	USS Abraham Lincoln (CVN-72)	PSA	3,000,000	4/90
	USS Enterprise (CVN-65)	OH	9,800,000	9/91
Norfolk Naval Yard	USS Baton Rouge (SSN-689)	SRA	5,462,494	10/88
	USS Memphis (SSN-691)	SRA	8,486,562	10/88
	USS Hyman G. Rickover (SSN-709)	SRA	9,055,518	3/90
Norfolk Shipbuilding	AO-178, 179 & 186	PM	38,900,000	—-
	USS Lawrence (DDG-4)	REP	4,966,666	—-
	Mormacsea & Mormacsaga (RRF)	UPG	7,973,482	—-
North Florida Shipyards	USS Paul (FF-1080)	REP	3,632,240	12/88
Northwest Marine Iron Works	USS Anchorage (LSD-36)	ROH	15,300,000	11/88
	USNS Kawashiwi (T-AO-146)	DD & OH	4,775,510	—-
	USS Okinawa (LPH-3)	ROH	14,091,106	1/89
Pennsylvania Shipbuilding	USS Patterson (FF-1061)	PM	5-10mil/yr	91
	USS Butte (AE-27), USS Nitro (AE-23) & USS Suribachi (AE-21)	PMA	69,000,000	93
Philadelphia Navy Yard	USS Independence (CV-62)	SLEP	240,000,000	—-
	USS Kidd (DDG-993)	OH	35,000,000	9/89
Portsmouth Naval Yard	USS Kamehameha (SSBN-642)	ROH	112,100,000	11/88
	USS Albuquerque (SSN-706) & USS Philadelphia (SSN-690)	SRA	11,416,336	11/88
Puget Sound Naval Yard	USS Nimitz (CVN-68)	REP & OH	—-	89
	USS Alexander Hamilton (SSBN-617)	ROH	110,713,798	11/89
Robert E. Derecktor Service Engineering	USS Connole (FF-1056)	ROH	2,500,000	—-
	USNS Spica (T-AFS-9)	OH	10,700,000	—-
	AE-29, 32-34	PM	4,154,000	89
	USS Mauna Kea (AE-22)	PMA	4,000,000	1/89
	USS Enterprise (CVN-65)	SRA	4,858,686	3/89
Southwest Marine	USS Dubuque (LPD-8)	OH	10,000,000	—-
	USS O'Brien (DD-975)	REP & UPG	2,300,000	11/89
	USS Jarrett (FFG-33)	EDSRA	12,900,000	10/89
	USS George Philip (FFG-12)	EDSRA	10,758,483	4/89
	USS Wichita (AOR-1) & USS Kansas (AOR-3)	REP	41,600,000	—-
	LST-1185, -1186 & -1191	OH	35,000,000	87-89
	USS Anchorage (LSD-36)	ROH	15,048,870	11/88
	USS Stein (FF-1065)	ROH	9,148,194	10/88
	USS Knox (FF-1052)	ROH	8,092,380	2/89
	USS Thach (FFG-43) USS McClusky (FFG-41)	DSRA	9,920,280	3/89
Stevens Technical Services	Patriot State (MarAd)	REP	689,000	10/88
Tacoma Boatbuilding	USNS Hayes (T-AG-195)	CONV	33,878,232	3/90
Tampa Shipyards	T-ACS-7 & 8	CONV	43,158,333	10/88
Todd-Seattle	8 WHECs	OH	234,903,000	2/91
Triple A Machine Shop	SS Petersburg (MarAd)	REP	346,769	12/88
	Golden State (MarAd)	REP	409,249	11/88
USCG-Curtis Bay	14 buoy tenders	SLEP	8,500,000	—-
	16 WMECs	MAINT	—-	—-

Legend: CONV-Conversion; DEACT-Deactivation; DSRA-Docking Selected Restricted Availability; EDSTRA-Extended Docking Selected Restricted Availability; MAINT-Maintenance; MODIF-Moficiation; MMA-Major Maintenance Availability; OH-Overhaul; PM-Phased Maintenance; PMA-Phased Maintenance Availability; PSA-post-Shakedown Availability; REF-refit; REP-Repair; ROH-Reglar Overhaul; SER-Service; SLEP-Service Life Extension Program; SRA-Selected Restricted Availability; UPG-Upgrade.

Major Navy Contracts

(continued)

$7,960,831 firm-fixed-price contract for the Selected Restricted Availability of USS Enterprise (CVN-65). The work is expected to be completed in March 1989. The Supervisor of Shipbuilding, Conversion and Repair, San Francisco, Calif., is the contracting activity (N00024-85-H-8218).

Raytheon Service Company, Virginia Beach, Va., was awarded a **$4,000,000** time and delivery order under a basic ordering agreement for repair of critically required components of NATO Seasparrow and Tartar systems. The work will be completed in June 1989. The Navy Ships Parts Control Center, Mechanicsburg, Pa., is the contracting activity (N00104-87-G-A026).

August 5

Service Engineering Company, San Francisco, Calif., was awarded a **$6,855,930** firm-fixed-price contract for the Selected Restricted Availability of USS Enterprise (CVN-65). The work is expected to be completed March 31, 1989. The Supervisor of Shipbuilding, Conversion and Repair, San Francisco, Calif., is the contracting activity (N00024-85-H-8217).

August 8

Westmont Industries, Santa Fe Springs, Calif., was awarded a **$24,090,000** firm-fixed-price contract for the construction of five 100-ton floating cranes. The Naval Facilities Engineering Command, Northern Division, Philadelphia, Pa., is the contracting activity (N62472-87-C-1455).

August 11

Continental Maritime, San Diego, Calif., was awarded a **$4,006,893** firm-fixed-price contract for tank repairs and preservation, and piping system, air conditioning plant and machinery repair services for USS Ranger (CV-61). The Supervisor of Shipbuilding, Conversion and Repair, USN, San Diego, Calif., was the contracting activity (N00024-85-H-8212.)

August 15

Service Engineering Company, San Francisco, Calif., was awarded a **$4,858,686** firm-fixed-price contract for the Selected Restricted Availability of USS Enterprise (CVN 65). The work is expected to be completed in March 1989. The Supervisor of Shipbuilding, Conversion and Repair, USN, San Francisco, Calif., is the contracting activity (N00024-85-H-8217).

August 17

Charleston Naval Shipyard, Charleston, S.C., was awarded a **$9,370,334** firm-fixed-price assignment for the Extended Refit Period (ERP) for USS Von Steuben (SSBN 632). The work is expected to be completed in March 1990. The Naval Sea Systems Command, is the requesting activity.

August 18

Bethlehem Steel Corporation, Sparrows Point, Md., was awarded a **$3,305,013** firm-fixed-price contract for Drydock Selected Restricted Availability for USS Barney (DDG-6). The work is expected to be completed on January 13, 1989. Naval Sea Systems Command is the contracting activity (N00024-85-8129).

August 23

AT&T Technologies Incorporated, Greensboro, N.C., was awarded a **$3,813,530** modification to a previously awarded cost-plus-fixed-fee contract for oceanographic services. The Space and Naval Warfare Systems Command, Washington, D.C., was the contracting activity (N00039-88-C-0069).

August 29

Clyde G. Steagall, DBA Mid Valley Electric, Rio Linda, Calif., was awarded a **$4,173,950** firm-fixed-price contract for the upgrade of an electrical distribution system at the Naval Shipyard, Mare Island, Calif. Work is expected to be completed in February 1990. The Naval Facilities Engineering Command, Western Division, San Bruno, Calif., is the contracting activity (N62474-

(continued)

88-C-4251).

Raytheon Company, Submarine Signal Division, Portsmouth, R.I., was awarded a **$48,492,649** firm-fixed-price contract for AN/BSY-1(V) transmit group systems for SSN-768, SSN-769 and SSN-770. The work is expected to be completed in December 1990. Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-6294).

August 30

North Florida Shipyards Incorporated, Jacksonville, Fla., was awarded a **$3,632,240** firm-fixed-price contract for repairs and alterations to USS Paul (FF-1080). The work is expected to be completed December 31, 1988. The Supervisor of Shipbuilding, Conversion and Repair, Jacksonville, Fla., is the contracting activity (N00024-85-H-8196).

September 1

Jacksonville Shipyards Incorporated, Jacksonville, Fla., was awarded a **$7,028,147** firm-fixed-price contract for the material and readiness upgrade of USNS Marshfield (T-AK-282), a Military Sealift Command dry cargo ship used for submarine resupply. The Military Sealift Command, Washington, D.C., is the contracting activity (N00033-88-C-3034).

September 2

Norfolk Naval Shipyard, Portsmouth, Va., was the successful offeror in a competitive program between public and private sector shipyards for the Selected Restricted Availability (SRA II) of USS Hyman G. Rickover (SSN-709). The shipyard is being assigned the SRA on a firm-fixed-price basis. The price of this effort is **$9,055,518.** The work is expected to be completed March 8, 1990. The Naval Sea Systems Command, Washington, D.C., is the requiring activity.

Newport News Shipbuilding and Dry Dock Company, Newport News, Va., was awarded a **$3,000,000** cost-plus-fixed-fee contract for planning and material support for post shakedown availability for Abraham Lincoln (CVN-72). Work is expected to be completed in April 1990. The Supervisor of Shipbuilding, Conversion and Repair, Newport News, Va., is the contracting activity (N00024-86-H-8002).

September 8

IBM Corporation, Manassas, Va., was awarded a **$4,190,308** firm-fixed-price contract for high volume modules for AN/UYS-1 advanced signal processors. The work is expected to be completed in March 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-88-C-5217).

Williams International Corporation, Walled Lake, Mich., was awarded a **$9,540,000** firm-fixed-price contract for design agent support for 450 F107-WR-400 Tomahawk sea-launched cruise missiles. The work is expected to be completed in September 1989. The Cruise Missiles Project Office, Naval Air Systems Command, Washington, D.C., is the contracting activity (N00019-87-C-3104).

Foss Maritime Company, Seattle, Wash., was awarded a **$6,283,131** firm-fixed-price plus reimbursables contract to provide tug services for the U.S. Navy in the vicinity of Kings Bay, Ga. The contract performance period is 18 months, with the government's option to cancel after one year. Service began at a mutually agreeable date in November 1988. The Military Sealift Command, Washington, D.C., is the contracting activity (N00033-88-C-1209).

Honeywell Incorporated, Hopkins, Minn., was awarded a **$9,100,000** modification to a previously awarded firm-fixed-price contract for materials and services for the MK 46 torpedo. The work is expected to be completed in May 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-87-C-6052).

Southwest Marine Incorporated, San Diego, Calif., was awarded a **$9,920,280** firm-fixed-price contract for Drydocking Selected Restricted Availability for USS Thach (FFG-43) and USS McClusky (FFG-41). The work is expected to be completed March 3, 1989. The Supervisor of Shipbuilding, Conversion and Repair, San Diego, Calif., is the contracting activity (N00024-85-H-8221).

Raytheon Comany, Wayland, Mass., was awarded a **$7,816,862** modification to a previously awarded cost-plus-fixed-fee contract for technical design and engineering support services for the MK 99 fire control system and the SPY 1-D transmitter. The work is expected to be completed on September 30, 1990. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-5131).

September 26

Unisys Corp., Great Neck, N.Y., was awarded a **$16 million** contract for combat system services for Spanish Navy frigates. The work is to be completed by February 1992. Awarding the contract was the Naval Sea Systems Command (N00024-88-C-5245).

September 27

General Dynamics, Pomona, Calif., was awarded a **$12 million** contract for 86 line items of spare parts for Phalanx Close-In Weapon Systems. The work is to be completed September 1991. Awarding the contract was the Navy Ships Parts Control Center, Mechanicsburg, Pa. (N00104-88-C-2838).

Raytheon Co., Marlborough, Mass., was awarded a **$4 million** contract for 23 line items of electronic spares in support of AN/WSC-6 shipboard radios. The work is to be completed January 1990. Awarding the

(continued)

NASSCO Wins $15.2-Million Pact For Navy Repair Work

National Steel & Shipbuilding Company (NASSCO), San Diego, Calif., was recently awarded ship-repair contracts worth $15.2 million.

In January, NASSCO will begin the overhaul of the USS Reasoner (FF-1063) under an $8.7-million contract. The work should be completed in August 1989.

Under a second, two-ship contract valued at $6.5 million, NASSCO will conduct post-shakedown availability work on the USS Champlain (CG-57) and the USS Princeton (CG-59). The work on the USS Champlain will commence in February and run to the end of April, while the work on the USS Princeton will run from August to November 1989.

MMA Meeting Studies Changes In Navy Acquisition

The Marine Machinery Association recently held its fall Government/Industry forum in Crystal City with strong participation from industry as well as from the Navy's engineering and purchasing communities.

MMA's president, **Jim Fromfield** of Leslie Controls, reported on the expansion and improvement in the lines of communication between the Navy and its machinery and equipment manufacturers, and he described some of the positive changes that are even now taking place. Mr. **Fromfield** told of recent meetings between MMA and senior officials of the Navy where new joint efforts were planned. Some of the subjects that are part of the ongoing discussions, he said, included research and development projects for hull, mechanical, and electrical manufacturers, and proprietary data rights issues facing the Navy as well as the industry.

MMA's past president, **Jack Janetatos** of Baker & McKenzie, observed that a new set of interim data rights regulations were expected to be released shortly, making some changes which recognize the rights of manufacturers as viewed by Congress. He said that at the recent meetings with Navy officials initiated by Mr. **Fromfield,** he noted an increasing awareness of the data rights problems faced by the industry. He went on to discuss the new law requiring increased quality standards for spare parts that Congress had just passed with strong MMA support. The new requirement, which was part of the 1989 Defense Authorization Act, requires the Defense Department, when buying spare parts critical to the operation of a ship or aircraft, to specify, wherever possible, the same quality standards on spare parts as were called out on the originals. Passing this law shows that Congress is truly committed to quality for our ships. He noted in closing that while the political support of the shipbuilders is concentrated in the coastal states, the machinery and equipment suppliers, MMA's members, exert political strength throughout the country.

Adm. **Roger B. Horne,** USN, Deputy Commander for Ship Design and Engineering, Naval Sea Systems Command, addressing the Marine Machinery Association.

Charles Thomas, Director of Quality Assurance at Ward Machinery Company, discussed the emphasis being placed on Statistical Process Control (SPC) which is increasingly required by government contracts. He explained how the concept was introduced into his company and how the benefits of it have been achieved. **Willis Willoughby,** the Navy's Chief of Quality Assurance, urged both industry and the Navy to concentrate efforts and investment on quality and productivity improvement.

Navy Capt. **Wayne Humphreys,** the Chief of Staff of the Commission on Merchant Marine and Defense, discussed the effect of the ending of merchant ship construction in the United States, noting that it reduces our ability to support our national security interests. Captain Humphreys said the growing magnitude of that problem is only beginning to be dealt with by the Department of Defense and even that effort has wholly inadequate funding. In thanking MMA for the help it has given the Commission, he urged that this support

At the recent Marine Machinery Association Government/Industry Forum from left to right: **Ronald J. Duddleston,** Executive Director, Ships Parts Control Center; Capt. **Wayne I. Humphreys,** USN, Chief of Staff, Commission on Merchant Marine and Defense; Senator **William S. Cohen,** Senate Armed Services Committee; and **James P. Fromfield,** president, Marine Machinery Association.

continue as the Commission issues its third report shortly and its fourth report in January.

In an extremely well received luncheon address, Rear Adm. **Roger B. Horne,** Deputy Commander of the Naval Sea Systems Command for Design and Engineering, issued a call for greater industry and Navy efforts at improving quality. He noted that the time for crew response to a combat threat is now measured in seconds—no longer in hours. Equipment, he said, must perform properly, to its design standards, and with instant response. Admiral **Horne** stated that the Navy depends on its manufacturers to deliver quality and design innovation and urged joint efforts at improving specifications and shipbuilding standards.

William A. Tarbell, NAVSEA's Chief of Acquisition Planning, pointing to Undersecretary of Defense Costello's July report, "Bolstering Defense Industrial Competitiveness," recognized the problem to the national defense resulting from the decline in the shipbuilding industrial base. He expressed the view that DoD efforts alone could not bring about all the improvement needed. He acknowledged that Seawolf (SSN-21) is the only new ship program on the books now, and this alone will not be enough to have any large impact on preserving the industrial base.

Senator **William Cohen** of Maine, in a dynamic presentation, demonstrated a keen awareness of industry difficulties and a determination to do something to help. Senator **Cohen** most clearly expressed the Congressional support that exists for the Navy. He said that he remains confident that with the rising nationalism in the country, the Navy will continue to get the funds it needs. "This year," Senator **Cohen** said, "they got more than they asked for." Senator **Cohen,** in pointing out some of the problems flowing from the decline of merchant shipbuilding, noted that the public does not yet understand the importance of the merchant marine to the defense of the nation.

At the end of the program, **Jim Fromfield** announced the next MMA members meeting to be held at Pascagoula on February 21-22, 1989. The meeting is intended to bring shipbuilders together with their best suppliers, and machinery and equipment manufacturers together with their best customers. MMA plans presentations by executives from each of the major shipbuilders, the manufacturers, and Navy representatives. Those manufacturers of naval shipboard machinery and equipment who wish to join MMA and anyone wishing to attend the February meeting should contact: Marine Machinery Association, 1700 K Street, N.W., Suite 903, Washington, D.C. 20006; or telephone: (202) 293-7169.

Philadelphia Sections Of SNAME, ASNE Hear Paper On Maritime Industry

The Philadelphia section of the Society of Naval Architects & Marine Engineers (SNAME) recently met with the Philadelphia Chapter of the American Society of Naval Engineers (ASNE) to hear a paper entitled, "The Maritime Industry at the Crossroads."

Capt. **Silas O. Nunn**, USN (Ret.), vice president—programs of the Shipbuilders Council of America, was the author and presenter of the paper. His presentation is based on his belief that 1989 will be watershed year for the maritime industry and his informed opinion that "decisions made and laws enacted over the next 12 to 15 months will set our course for many years to come."

Others in attendance included SNAME vice chairman **David F. McMullen** and ASNE chairman Capt. **John Dachos**, USN (Ret.), and **Frank Toski** and **John Ravold**, who organized the evening's events.

Navy Awards $76.6-Million Pact To GD-Electric Boat

General Dynamics' Electric Boat Division, Groton, Conn., was recently awarded a $76.6-million contract for the continued development of the steam and electrical plant for the U.S. Navy's Seawolf Class (SSN-21) attack submarine.

Halter Marine Delivers First Of Six U.S. Navy Ocean Surveillance Ships In $85-Million Contract

Halter Marine Inc. recently delivered the U.S. Naval Ship Adventurous, the first of six identical T-AGOS ocean surveillance ships under construction at Halter for the Navy with a total contract value of approximately $85 million.

The Adventurous is the 11th of 18 planned monohull T-AGOS-class ships to join the Navy's ocean surveillance program.

Operated by the Military Sealift Command (MSC) and manned by civilian technicians, the Adventurous will monitor the movement of submarines by deploying towed linear arrays of hydrophones known as the Surveillance Towed Array Sonar System (SURTASS).

The SURTASS system is comprised of flexible, neutrally buoyant cable containing a large number of passive microphones, each tuned to specific frequencies enabling identification of noises made by submarines many miles away.

The data is processed and transmitted to shore via satellite, where it supplements information from seabed arrays.

The all-steel Adventurous is 224 feet long, with a 43-foot beam, and

The Caterpillar-powered Adventurous carries nine officers, 11 crew, and 10 technicians. In addition to the usual living spaces, she has a recreation room, exercise room, ship's store, and a self-service laundry.

15-foot 1-inch draft. Main propulsion and other ship's service is diesel-electric, provided by four Caterpillar-Kato 600-kw diesel generators driving two General Electric motors. Power is transmitted through two shafts and full load displacement is approximately 2,300 long tons. Maximum speed is approximately 11 knots and normal operating speed is about three knots.

The fourth Halter T-AGOS ship will be christened in the fall of 1988, and the company will soon begin construction of a Halter-designed 263-foot oceanographic research ship for the U.S. Navy. The new class 3,200-ton, diesel electric, $20.9-million, dynamically positioned AGOR 23 will be operated by the University of Washington.

Halter Marine Inc. is one of the Trinity Marine Group of shipbuilding companies.

For more information and free literature on the facilities and capabilities of Halter Marine,

Circle 22 on Reader Service Card

Major Navy Contracts

(continued)

contract was the Navy Ships Parts Control Center, Mechanicsburg, Pa. (N00039-87-C-0168).

Raytheon's Submarine Signal Division, Portsmouth, R.I., was awarded a **$406 million** contract for MK2 combat control systems for SSN-688 and SSBN-762 class submarines. The work is to be completed September 1992. Awarding the contract was the Naval Sea Systems Command (N00024-88-C-6067).

September 29

Halter Marine Inc., New Orleans, La., was awarded a **$10.1 million** contract for the construction of three 100-ton floating cranes. The work is to be completed April 1990. Awarding the contract was the Naval Facilities Engineering Command, Philadelphia, Pa. (N62472-88-C-1460).

September 30

National Steel and Shipbuilding Co., San Diego, Calif., was awarded a **$3.2 million** contract for Post Shakedown Availability for USS Lake Champlain (CG-57). The work is to be completed June 30, 1989. Awarding the contract was the Naval Sea Systems Command (N00024-88-C-2016).

Newport News Shipbuilding and Dry Dock Co., Newport News, Va., was awarded a **$9.8 million** modification to a contract for preparation for the complex overhaul of USS Enterprise (CVN-65). The work is to be completed Sept. 30, 1991. Awarding the contract was the Naval Sea Systems Command, Washington (N00024-86-C-2078).

Honeywell Inc., Everett, Wash., was awarded a **$12.3 million** modification to a contract for materials and services for AN/BQS-14A sonars. The work is to be completed August 1992. Awarding the contract was the Naval Sea Systems Command (N00024-87-C-6105).

Bath Iron Works, Bath, Maine, was awarded a **$27.3 million** modification to a contract for repair services for USS Samuel B. Roberts (FFG-58). The work is to be completed Nov. 13, 1989. Awarding the contract was the Naval Sea Systems Command (N00024-88-R-8520).

Ingalls Shipbuilding Inc., Pascagoula, Miss., was awarded a $341.4 million modification to a contract for the design and construction of LHD-4, a Wasp class amphibious assault ship. The work is to be completed April 1994. Awarding the contract was the Naval Sea Systems Command (N00024-86-C-2005).

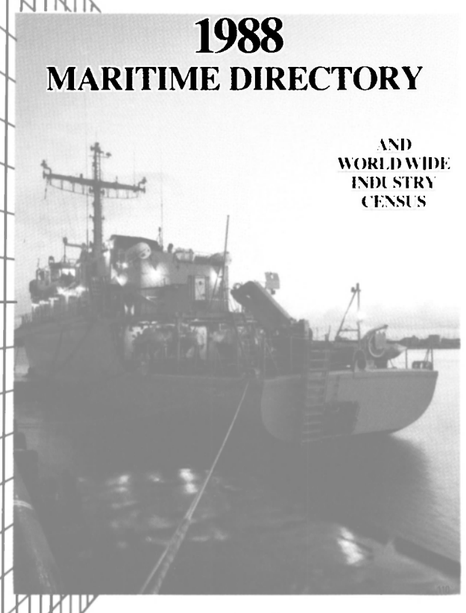
B. F. Goodrich Co., Uniontown, Ohio, was awarded a **$9.8 million** contract for 850 MK-6 lifeboat assemblies. Work is to be completed April 1990. Awarding the contract was the Navy Ships Parts and Control Center, Mechanicsburg, Pa. (N00104-88-G-0210).

ALL NEW
OVER 400 PAGES!

The Who's Who of the U.S. Maritime Industry!!

Everything You Need...

It is the world's only complete directory of U.S. ship owners and builders.



It Includes:

Names and titles of key personnel in every major vessel operating company and shipbuilding and ship repair company in the United States. From the smallest single boat operator and inland repair yard to the largest merchant fleet owners and major shipbuilders.

The Maritime Directory provides you with every conceivable detail.

Plus... The Worldwide Industry Census

Thousands of details and statistics on vessel operations (ocean going, inland, harbor, offshore), offshore drilling, U.S. and foreign Navies, shipbuilding and ship repair (commercial and military). A review of the census reveals the major role played by the U.S. ship owners/operators and the U.S. Navy in our industry.

Order
Your Own
Personal Copy
Today!

MARITIME REPORTER AND ENGINEERING NEWS

MAIL TO: MARITIME REPORTER, 118 East 25th Street, New York, NY 10010

NAME _____

POSITION _____

COMPANY _____

BUSINESS _____

ADDRESS _____

☐ Enclosed is my remittance of $110.00 per copy for _____ copies of the Maritime Directory and Worldwide Industry Census.

☐ Please bill me. ☐ Please bill my company.

Circle 125 on Reader Service Card

(continued)

heads separate the hull of the North King into fire sections. Her forward section houses the forepeak, BBC fridge compressors and Jastram bowthruster. Accommodations for her crew of 12 and located in the second section, while the third section contains the hold. The fourth section contains the engine room.

The North King is equipped with two Neunfelder Maschienfabrik cranes, with safe working loads of 30 and 35 tons at outreaches of 79 and 65 feet, respectively. Other deck machinery was supplied by Steen.

ODEN
Gotaverken Arendal

In the last quarter of 1988, shipbuilder Gotaverken Arendal AB (GVA) of Gothenburg, Sweden, delivered Sweden's newest and most modern icebreaker, the 353-1/2-foot Oden, to her owners, Svenskt Isbrytarkonsortium KB, Stockholm, Sweden.

Designed and developed by GVA in collaboration with Canadian Marine Drilling Ltd. of Canada, the Oden represents an enormous advance in global icebreaker technology. She has a beam at midships of 82 feet, maximum displacement of 13,000 tons, and draft operation range of 23 to 28 feet. Her beam over reamer is over 96 feet, making her, if not the widest, than one of the widest icebreakers in the world. The Oden is powered by four medium-speed, eight-cylinder Sulzer ZAL40S diesel engines with a total output of 24,500 hp. She is equipped with two dual input single output Renk Tacke reduction gears and fitted with a pair of controllable-pitch Lips propellers in nozzles. Electric power is supplied by four medium-speed six-cylinder Sulzer AT25H diesel engines.

The powerful Oden has a wide spoon-shaped bow which is relatively shorter and more blunt than that of conventional icebreakers. Additionally, along both sides of her intermediate link, between her bow and midships section, she is fitted with reamers, an oblique bulb-like structure, which enables the Oden to open a 96-foot-wide channel through ice, despite having only an 82-foot beam at midships. The Oden is able to break 1.8 meters (about 6 feet) of level ice at 3 knots. Her turning radius is one ship length in 0.8 meters (about 2-1/2 feet) of ice.

The Oden, which replaces the 1957-built Oden, has standard quarters for 48 people and an operating crew of 26.

(continued)

ODEN
Equipment List

Main engines (4)	Sulzer
CP propellers	Lips
Reduction gears	Renk Tacke
Generator engines	Sulzer
Emergency generator	Cummins
Boilers	Sunrod
Computerized control system	Asea Master
Mooring winches	Pusnes
Integrated navigation systems	Sperry
Navigator	Robertson-Shipmate
Hull wash/jet thruster system	Scanpump
Propeller pumps	JW Berg
Towing winch	Pusnes
Cranes	Hydralift
Lifeboats	Harding

Oden

Left: **Torm Margrethe**

PRESIDENT TRUMAN & PRESIDENT POLK HDW & Bremer Vulkan

During 1988, American President Lines, Oakland, Calif., took delivery of the five of its new C-10 Class containerships from the West German shipyards of Howaldswerke Deutsche Werft (HDW) and Bremer Vulkan AG, for use in its Pacific Basin service. HDW built three of the ships, while Bremer Vulkan delivered the remaining two.

The first ship delivered by HDW was christened the President Truman, while the first C-10 Class vessel delivered by Bremer Vulkan was the President Polk. The containerships each have an overall length of 902 feet, beam of 129 feet, maximum draft of 41 feet, displacement of 75,862 long tons and a deadweight of 53,648 long tons. Classed by the American Bureau of Shipping,´1 E, Container Carrier´MS + ACCU, the Truman and Polk are propelled to speeds of up to 24 knots by some of the most powerful diesel engines ever built. Each C-10 is propelled by a single 57,000-hp, 12-cylinder Sulzer diesel engine. The engine was designed in Switzerland and built in South Korea under license, and is approximately 71 feet high and 45 feet long and weighs about 1,700 tons. Each of the 12 cylinders measures nearly three feet in diameter and travels about 8 feet per stroke. The piston and rod assembly weighs more than 6 tons. For the power it generates, this engine is among the most efficient in terms of fuel consumption.

The fuel-efficient C-10 Class ships, which are each capable of carrying 4,300 TEU containers, are the first container-carrying vessels to have a "post-Panamax" beam, meaning their width exceeds the limitations of the Panama Canal. As with the development of the wide-bodied aircraft, the increased capacity and efficiency requirements for these vessels led to the new design concept.

"These are the first ships to be designed specifically for trans-Pacific service," said **Timothy J. Rhein**, APL president. "By removing the limitation on the ships' beam, we were able to significantly increase their capacity, while optimizing their speed, fuel efficiency and stability."

The three sister ships of the Truman and Polk, the President Kennedy and President Jackson (built by HDW) and President Adams, built by Bremerhaven-based Bremer Vulkan, were also delivered during 1988 and phased into APL's Pacific Basin service.

APL C-10 CLASS
Equipment List

Main engine	Sulzer
Propeller	Ostermann
Generator engines	Krupp MaK
Auxiliary generator engine	Caterpillar
Generators	A. von Kaick
Bowthruster	KaMeWa
Central automation	Siemens
Boilers	HDW
ARPAs	Raytheon
GPS loran	Trimble
SatNav & integrated navigation system	Raytheon
Doppler log & echo sounder	JRC
Gyrocompass & autopilot	Anschutz
SOLAS console, VHF transceiver, HF receiver, satcom, VHF auto direction finder, radio, watch receiver, antennas & marine fax	Mackay
Rudder angle	Stein-Sohn
Fog signal	Elaplan
Distillation	Alfa Laval Nirex
Waste disposal	Format Chemie
Sewage treatment	Hamworthy
Cathodic protection	Electrocatalytic
Anchoring	Blohm & Voss
Anchor chain	Ramnas
Mooring winches	Norwich
Lifeboat	Fassmer
Davits	Schat
Life rafts	Viking
Monorail	ASEA Hagglund
Steering gear	Brown Brothers

ROYAL VIKING SUN
Wartsila Marine

By the end of this year, the Turku shipyard of Wartsila Marine Industries Inc. will have delivered one of the world's most luxurious cruise vessels, when the Royal Viking Sun joins the fleet of Royal Viking Line.

At 36,000 gross tons, the new Royal Viking Sun will be almost a third larger than existing Royal Viking ships, yet will carry only 760 passengers. She will have larger cabins, more open deck space and more public room space per passenger than most other cruise vessels—either afloat or under construction.

"This will be the most luxurious ship in the world in keeping with Royal Viking Line's premier position in the cruise industry," said **Einar Kloster**, chairman of Kloster Cruise.

The Royal Viking Sun will have an overall length of 669 feet, molded breadth of 95 feet and draft of 23 feet. Her propulsion system will feature four 8-cylinder ZA40 Wartsila-Sulzer main diesel engines developing a total of 28,161 hp. She will have a speed of 21-1/2 knots.

Many of the traditional features found in other Royal Viking cruise ships have been retained in the design of the Royal Viking Sun. For example, the ship features an unobstructed Promenade Deck circling the ship and her main dining room has been designed to accommodate all of the passengers at a single seating.

Almost 40 percent of the Royal Viking Sun's 380 cabins are deluxe staterooms, each with a private verandah.

After official inauguration cruises, the Royal Viking Sun will set sail on a 100-day around the world cruise on January 8, from San Francisco, ending up in Fort Lauderdale, Fla., on April 16.

The Royal Viking Sun's firefighting equipment, hospital and medical equipment, welding gas central and distribution system, electrical welding equipment, high pressure cleaning equipment, gas meters and measuring equipment were all supplied by Unitor Ships Service of Norway.

SEAWARD
Wartsila Marine

Besides delivering the outstanding cruise ship Royal Viking Sun, busy Finnish shipbuilder Wartsila Marine Industries Inc.'s Turku yard also completed its biggest passenger vessel to date, the 1,800-passenger Seaward. She is the first new generation cruise ship built at the yard.

Delivered to Kloster Cruise Ltd., the 708-1/2-foot Seaward has a beam of 95 feet, maximum draft of 23 feet and gross tonnage of 42,300. The vessel is powered by four eight-cylinder Sulzer ZA40 medium-speed diesel engines which produce a total of 28,800 bhp. She can cruise at speeds of more than 21 knots.

Shaft alternators driven by power take-offs (PTOs) from the two main gearboxes provide electricity while maneuvering, and also supply a part of the ship's at-sea auxiliary power requirements.

The vessel, which is manned by a crew of 600, is operated by Norwegian Cruise Line, Miami, Fla., a subsidiary of Kloster Cruise Ltd., on seven-day cruises in the Caribbean.

In addition to the 774 passenger cabins on board, there is ample public space, including three large restaurants, three night clubs, seven bars, a casino, spacious shops, a beauty salon, saunas, a fitness center, two swimming pools, whirlpools, a laundrette, a hospital and several rooms reserved for various entertainment games.

The Seaward is fitted with advanced firefighting equipment, including fire extinguishers, fire hoses, and firemen's outfits, along with a modern welding gas central and distribution system supplied by Unitor Ships Service. Unitor also supplied an owner's supply medical package that included medicine and medical equipment.

SHOUSHONE SPIRIT
3. Maj

This year, Yugoslavian shipbuilder 3. Maj's Rijeka shipyard delivered its largest ship ever,the 110,000-dwt tanker Shoushone Spirit. She is the first of three of her type ordered by VSSI Carriers of Liberia.

Intended for the carriage of crude oil of up to 10.5 t/cu.m. specific

(continued)

OUTSTANDING OCEANGOING SHIPS 1988

SHIP	TYPE	DIMENSIONS Lgth-Wdth-Dft (in feet)	TONNAGE	MAIN ENGINES	OWNER/OPERATOR	BUILDER
Amorella	Car/Pass. Ferry	555½x90½x19½	37,500 gt	SEMT Pilestick-Jadranbrod	SF Line	Brodosplit
Auto Diana	Car Carrier	654½x106x27	48,000 t	MAN B&W-KHIC	Pan Ocean Shipping	Daewoo Shipbuilding
Castillo De Burton	Bulk Carrier	787x118x39	74,000 dwt	Sulzer-AESA	Elcano	AESA
CGM La Perouse	Containership	750x105½x34	41,900 dwt	Sulzer	Compagnie Generale Maritime	Samsung Heavy Industries
Charles B. Renfrew	Tanker	784½x122x36	77,414 dwt 44,840 gt	MAN B&W-MHI (2)	Chevron Transport Corp.	Mitsubishi Heavy Industries
Crown Odyssey	Cruise Ship	616x92½x23	40,000 gt	Krupp MaK (4)	Royal Cruise Line	Meyer Werft
Eternal Ace	Car Carrier	654x106x32	55,380 gt 18,701 dwt	MAN B&W-Mitsui	Perennial Motors Transport Inc.	Mitsui Engineering & Shipbuilding
Kunisaki Maru	Ore Carrier	1,033x170½x59	227,960 dwt 110,039 gt	MAN B&W-Hitachi	Friend Shipping	Hitachi Zosen
McDermott DB 50	Crane Ship	495x151x31	29,722 gt	Allen (5)[1]	Lombard Initial Leasing Ltd.	North East Shipbuilders Ltd.
Micoperi 7000	Semisub Crane Barge	574x285x34½	18,670 dwt	GMT (10)[2]	Micoperi SpA	Fincantieri-CNI
Nils Dacke	Rail Ferry	581x84½x20	24,000 t	MAN B&W (4)	Rederi AB Swedcarrier	Schichau-Seebeckwerft
North King	RO/RO	275½x52½x17½	3,056 dwt 1,905 gt	Wartsila Vasa	Antares Shipping	J.J. Sietas
Oden	Icebreaker	353½x82x23	13,000 gt	Sulzer (4)	National Swedish Administration of Shipping & Navigation	Gotaverken Arendal
President Polk	Containership	902x129x41	75,862 t	Sulzer-KHIC	American President Line	Bremer Vulkan
President Truman	Containership	902x129x41	75,862 t	Sulzer-KHIC	American President Line	Howaldswerke Deutsche Werft
Royal Viking Sun	Cruise Ship	669x95x23	36,000 gt	Sulzer-Wartsila (4)	Royal Viking Line	Wartsila Marine
Seaward	Cruise Ship	708½x95x23	42,000 gt	Sulzer-Wartsila (4)	Kloster Cruise Ltd.	Wartsila Marine
Shoushone Spirit	Tanker	809½x139x47	110,000 dwt	Sulzer-3. Maj	Teekay Shipping	3. Maj
Torm Margrethe	Product Tanker	750x106x38	60,000 dwt	MAN B&W	K/S Margretheholm	Burmeister & Wain
Walter S. Diehl	Oiler	667½x97½x36	42,000 t	Colt-Pielstick (2)	U.S. Navy	Avondale Industries
Yukong Frontier	VLCC	1,056x184x65	254,000 dwt	MAN B&W-Hyundai	Yukong Line Ltd.	HHI

Footnotes: 1. Each engine directly coupled to Brush Electrical Machines single-bearing brushless alternators; 2. Eight engines each drive an Ansaldo 10kv, 60Hz alternator rated at 5,600 kw, while remaining diesel engines each drive a 10kv, 60Hz alternator rated at 2,800 kw for harbor/port service.

gravity, the Shoushone Spirit has an overall length of 809-1/2 feet, breadth of 139.3 feet, and design draft of 47.3 feet. Her main propulsion engine is a slow-speed, reversible turbocharged diesel Sulzer-3.Maj 5RTA72 unit that has a maximum continuous rating of 13,852 hp at 78 rpm. The engine is designed to operate on both diesel and heavy fuel up to 420 cSt at 50 degrees C (4000 Redwood at 38 degrees C). She has a service speed of 14.6 knots.

The tanker is constructed in accordance with the rules of Lloyd's Register of Shipping, for the class +100A1 +LMC, UMS, IGS, OIL TANKER. Her degree of automation conforms to the rules and requirements of the classification society for unattended machinery space.

The materials used for her shell and structure are shipbuilding steel and high tensile steel.

Electrical power is provided by three diesel generators of about 1,050 kva each. The diesel generator engines are four-stroke, turbocharged, water-cooled models, directly coupled to the generators, and can be operated on diesel, as well as mixed heavy fuel up to 420 cSt at 50 degrees C (4000 Redwood at 38 degrees C). One emergency diesel generator rated at 200 kva at 1,800 rpm has also been installed.

The Shoushone Spirit is fitted with two 15-ton-capacity hydraulic slewing cranes, intended for handling manifold connection hoses for loading/discharging oil cargo.

The ship's 16 cargo tanks have a total capacity of 123,000 cubic meters with additional capacity of 2,500 cubic meters in her slop tanks. Each of the four segregations is equipped with a separate steam turbine driven centrifugal cargo pump employing dry saturated steam at 16 bars pressure. The total cargo discharge capacity amounts to 8,000 cubic meter/hour at cargo density of 1.025 t/cubic meters and 1 cSt vsicosity at 50 degrees C. The cargo pumps net positive suction height amounts to 120 meters. Cargo heating is provided by steam cargo heaters using the steam pressure of 8 bars, and providing the cargo temperature of 66 degrees C, even when surrounding air temperature drops to 2 degrees C, and at sea temperature is 5 degrees C.

TORM MARGRETHE
Burmeister & Wain

This year, Burmeister & Wain Skibsvaerft A/S, Copenhagen, Denmark, delivered the 750-foot product tanker Torm Margrethe to the Danish shipping company Torm, under a contract from K/S Margretheholm, a partnership of Danish tax investors.

The single-screw tanker was the eighth in a series of Panamax product tankers, type CPT54E, built by Burmeister & Wain. She has a beam of 106 feet and draft of 38 feet, and is powered by a single five-cylinder two-stroke MAN B&W Diesel L70MCE main engine, which develops 10,900 bhp at 84 rpm. She is fitted with a four-bladed propeller with a diameter of 23.6 feet. She has an average speed of 15.1 knots at a loaded design draft/ballasted condition of 90 percent.

In her engine room, the Torm Margrethe has four auxiliary engines—two six-cylinder MAN B&W T23LH-4E diesel engines each direct coupled to a 600-kw generator and two eight-cylinder MAN B&W L28/32 diesel engines each coupled to a hydraulic pump of 1,680 kw. One is also coupled to a 1,200-kw generator.

The bridge is equipped with the modern navigation equipment such as a direction finder, radar, satellite communication system, satellite

TORM MARGRETHE
Equipment List

Main engine	MAN B&W Diesel
Auxiliary engines	MAN B&W Holeby
Boilers	Aalborg Marine
Generators	ABB Kraft
Electric motors	AEG Dansk Akts.
Radars	Krupp Atlas
Radio station	Dansk Radio
Gyro/autopilot	Aage Hempel Int'l
Remote sounding	Austronica
Bridge maneuvering system & alarm system	Søren T. Lyngsø
Cargo oil pumps	Frank Mohn
Cooling water pumps	Desmi
Purifiers	Alfa Laval Zeta
Steering gear	Porsgrunn
Windlass & mooring	Pusnes
Fire equipment	Ginge-Kerr
Fire equipment	Walter Kidde
Hose-handling cranes	MTT
Lifeboats	Fassmer
Pipelines	Ludvigsen & Hermansen
Painting of cargo tanks	Mühlhann
Painting of ballast tanks	Ole Dufour
Paints, cargo tanks	J. C. Hempel
Other paints	International Farvefabrik

navigator, autopilot and gyrocompass. The bridge is also equipped with remote control equipment for the propulsion machinery to allow for unmanned engine room operation.

She is fitted with 12 cargo tanks (six on the port and six on the starboard side). She is capable of carrying up to 12 different oil products and chemicals at one time. She is classed and registered as +1A1 "tanker for oil and caustic soda, COW, EO, INERT," and in accordance with the"Tanker Safety and Pollution Prevention 1978."

WALTER S. DIEHL
Avondale

The U.S. Navy fleet oiler Walter S. Diehl (T-AO-193), the fifth in a series of 18 vessels of this type, was delivered in the third quarter by Avondale Industries Inc.'s Shipyards Division, New Orleans, La.

Built with the use of modern modular construction techniques, the Walter S. Diehl is 667-1/2 feet long with a beam of 97-1/2 feet, maximum draft of 36 feet and displacement of 42,000 long tons. Her main propulsion consists of two 10-cylinder PC4.2 Colt-Pielstick diesel engines manufactured by the Fairbanks Morse Engine Division of Colt Industries, Inc.

Currently, these engines are the largest U.S.-manufactured medium-speed diesels capable of burning either DFM or heavy fuels of up to 3,500 sec Redwood at 100 degrees F. The engines have a fuel rate of 136 grams/metric horsepower hour. The twin-screw design of the Walter S. Diehl provides improved directional stability, ease of control and mission reliability. The oiler is capable of speeds in excess of 20 knots.

The mission of the Walter S. Diehl and other ships of the T-AO-187 Class is to transport bulk products and fuel from shore depots to combatants and support forces underway. The ships also deliver limited fleet freight, cargo, water, lube oil, mail and personnel. The new ship has a cargo capacity of 183,500 barrels of oil in 18 cargo tanks and is capable of simultaneously receiving, storing and discharging two separate grades of cargo fuel. All cargo valve and pump operations and the ship's segregated ballast system are manipulated from the cargo control center located in the ship's aft superstructure, which has an overview of the entire underway replenishment is accomplished using transfer rigs with transfer hoses suspended by a span wire automatically maintained in a constant-tension range. The T-AO Class vessels are also capable of refueling helicopters from a vertical replenishment facility aft of the accommodation house.

WALTER S. DIEHL
Equipment List

Main engines (2)	Colt-Pielstick
CP propellers	Bird-Johnson
Reduction gears	L&S
Shafting	Bird-Johnson
Line shaft bearings	Avondale
Ships service generators	Bergen
Emergency generators	Energy Power
PTO generators	Cogenel
ME & PTO clutch coupling	Eaton
Main switchboards & group control centers	Federal Pacific
Bridge control console, engine room control console & cargo control console	GE
Steering gear	Jered Brown Bros.
RAS & deck equipment	Lake Shore
Anchor windlass	Lake Shore
Compass	Sperry
Radars	Precision Marine
RAM tensioner	Western Gear
HP air compressor	Ingersoll Rand
Ships service air compressor	Ingersoll Rand
F/O & L/O purifiers	Alfa Laval
Incinerator	Atlas Danmark
Distiller	Aqua-Chem
Boiler	Clayton
Valve actuators	Limitorque
A/C plant	Carrier Transicold
Joiner work	Hopeman Brothers
Sewage treatment unit	Red Fox
Vacuum collection system	Envirovac
Firefighting system	Hiller
Windows	Kearfott
Elevator	Unidynamics
Hull paint	International
Tank paint	Mobil
Cathodic protection	Electrocatalytic

YUKONG FRONTIER
HHI

In late June of this year, Hyundai

YUKONG FRONTIER
Equipment List

Main engine	MAN B&W-Hyundai
Propeller	Hyundai-Kobe Steel
Generator engine	Daihatsu
Radio equipment/VHF	JRC
Doppler docking system & radar	Krupp-Atlas Elektronik
Gyrocompass/autopilot	Hokushin
SatCom	JRC
Main switchboard, HP-LP displacement board & motor control gear	Terasaki-Hyundai
Monitoring system	Valmet-Hyundai
E/R control console	Hyundai
Electric cable	Yeonhab
Steering gear	MHI
Deck machinery	Pusnes-Hyundai
Hose-handling crane	Hagglund-Hyundai
Store & provision crane	Hagglund-Hyundai
Inert gas plant	Gadelius
Cargo oil pumping system with turbine	Naniwa-Eureka
Tank cleaning machine	Aall
Shop primer	Korea Chemical
Paint	Korea Chemical/IPR
Remote valve control system	Nakakita
Galley equipment	Electrolux
AC/refrigeration	Namirei
Stern tube seal	Kobe Steel
Centrifugal piston pump	Naniwa
FW generator	Atlas-Sasakura
Purifier	MKK
Boiler & economizer	MHI

Heavy Industries Co. Ltd. (HHI) in Korea delivered the 254,000-dwt Very Large Crude Carrier (VLCC) Yukong Frontier to her owner, Yukong Line Ltd. The ship is the standard type developed by Hyundai Shipyard, and the first in a series of three VLCCs ordered for Yukong Line.

Last year, HHI introduced a new design for for a 254,000-dwt class VLCC developed by its research institute, HMRI (Hyundai Maritime Research Institute. HMRI carried out model testing for performance prediction and performed a three-dimensional finite element analysis using coarse mesh for structural analysis.

Yukong Frontier is a flush deck type ship without forecastle and has a cylindrical bow and transom stern. The ship has six center cargo oil tanks, three pairs of side cargo oil tanks and one pair of slop tanks at her side, with a cargo oil capacity of 303,000 m³. She is able to load and discharge three different kinds of cargo oil simultaneosuly with an average cargo unloading rate of 15,000 m³/h using three main cargo pumps. The cargo loading rate of the ship reaches approximately 20,000 m³/h through the cargo manifolds.

The Yukong Frontier has an overall length of 1,056 feet, breadth of 184 feet and design draft of 65 feet. She is powered by a two-stroke, turbocharged, reversible type MAN B&W-Hyundai 6S80MC diesel engine developing an MCR of 22,110 bhp at 67.7 rpm and an NCR of 19,900 bhp at 65.4 rpm. Electric power is supplied by three 800-kw diesel generators and one 250-kw emergency generator.

The Yukong Frontier is equipped with both an adaptive steering autopilot system and microcomputer system for fuel and manpower savings.

Classed by ABS 1 (E), "Oil Carrier," and MS, CCU, IGS, COW, PL, PL, SBT of ABS, and +KSE, "Oil Carrier," +MKS, MA of KR, the ship has highly advanced automatic systems which enable the crew to control and monitor all essential functions with regard to the ship's operation, starters, generator power management system, etc. ■

$540-Million Order For Two Cruise Ships Placed By HAL With Bremer Vulkan Shipyard

Bremer Vulkan shipyard in Bremen will construct two cruise ships for Holland America Line (HAL) at a cost of $540 million. Bremer Vulkan will begin construction of the vessels as soon as details for financing have been worked out of what is now an agreement in principle between HAL and the shipyard.

The 600-gross-ton cruise ships have been designed to have an overall length of about 857 feet and width of 100 feet, and a service speed of about 21 knots. They will each have 1,876 berths, two special hospitality suites and 20 other suites with private balconies.

The vessels,which will operate in the U.S. west coast and Caribbean markets, are scheduled to be delivered in April 1991 and April 1992.

For free literature giving complete details on the facilities and capabilities of Bremer Vulkan shipyard,

Circle 78 on Reader Service Card

Arctec Offshore Corporation Completes Merger And Reorganization

Arctec Offshore Corporation (AOC) was recently formed by the merger of Offshore Technology Corporation and Arctec Engineering, Incorporated, with their parent company, Arctec, Incorporated.

Offshore Technology Corporation, one of the largest commercial, marine hydrodynamics laboratories in the U.S., is known worldwide for its facilities for testing hydrodynamic models of ships and offshore platforms. Arctec Engineering, Incorporated, is equally well known in the field of arctic marine, coastal and environmental engineering and for model and full scale testing in ice-covered waters.

The merger was designed to streamline the internal operations of the firm and to provide a single source of integrated engineering and technical services to support clients whose operations are conducted in hostile marine environments.

For more information and free literature on Arctec Offshore Corporation,

Circle 74 on Reader Service Card

Deck Cannister Now Offered For Avon Coastline Life Raft —Literature Available

A new fiberglass cannister pack is now available for the Avon Coastline Life Raft, augmenting the soft valise which continues to be offered.

The cannister permits mounting of the Coastline Life Raft on deck or in exposed locations, placements many owners of small sailboats and center-console fishermen have wanted to make. The valise has been principally intended for stowage inside lockers or within the console.

Avon Coastline was developed for smaller boats and for inshore/coastal navigation. Less expensive than Avon's standard ocean life rafts, Coastline still provides the security of two independent buoyance chambers (each adequate to support the rated capacity of six persons with 3.4 cubic feet/person), lanyard-triggered CO-2 inflation, protective canopy, moderate ballast system to resist overturning and the reassurance of Avon quality and reliability

The fiberglass deck cannister adds just 2 pounds to the valise's packed weight to 56 pounds. It is strong enough to be stood on or to withstand impacts from sailing or fishing tackle. Berwyn hydrostatic releases are optional.

For more information and free literature from Avon,

Circle 75 on Reader Service Card

Cummins-Powered Cruise/Dining Vessel 'Star Of Louisville' Now In Service On Ohio River

The Cummins-powered "Star" was built to a modified Danish design in exactly six months and three days by Marine Builders Of Utica, Ind.

The cruise/dining vessel Star of Louisville, built by Marine Builders Inc. of Utica, Ind., was recently put into service on the Ohio River and is now offering lunch, dinner and moonlight cruises along Louisville's shore. Owned by Star of Louisville, Inc., and operated by Starline Corporation, the vessel can accommodate 350 dinner passengers and is Coast Guard certified for a total of 600.

The Star of Louisville, 126 feet long by 35 feet wide, has two fully enclosed, temperature-controlled dining decks and an outdoor observation deck. Two 48-inch by 32-inch five-blade Doran propellers are turned through 3.5:1 reduction gears by twin Cummins NTA-855-M in-line, six-cylinder marine diesels rated 350 hp each at 1,800 rpm, providing speeds up to 12 mph under the 700-hp propulsion of the engines. The propulsion system incorporates Lo Rez vibration isolaters which dampen normal vibration, resulting in quiet operation over the entire speed range of the engines.

Two Cummins 6BT5.9 diesels were selected to drive Lima 100-kw generators, with one providing electrical power exclusively for the galley. All the Cummins engines were supplied by Cummins Cumberland, Inc. of Louisville.

The "Star" employs an electrical/hydraulic steering system designed by Marine Builders. Johnson keel coolers were specified, along with Furuno radar, a Polaris Regency VHF, depth finder, Murphy alarm system, and a Kahlenberg horn.

For more information and free literature on Cummins engines,

Circle 86 on Reader Service Card

For free literature on the facilities and capabilities of Marine Builders Inc.,

Circle 67 on Reader Service Card

High-Performance Coatings Division Acquired By Hempel From Reliance Universal —Literature Available

Hempel, one of the world's largest independent manufacturers of industrial and marine coatings, recently announced that an agreement has been reached with Reliance Universal to acquire the assets of their High-Performance Coatings Division, operating out of Houston, Texas. Reliance Universal, Inc., is a wholly owned subsidiary of Tyler Corporation.

The High-Performance Coatings Division of Reliance manufactures and markets a line of heavy-duty industrial coatings, supplementing Hempel's existing product lines.

The Hempel Group is pursuing a strategy as a global supplier of anti-corrosive coatings.

The present manufacturing facility in Wallington, N.J., together with the acquired plant in Houston, will improve the supply service to the marine and offshore markets by Hempel Coatings (USA), Inc. It will further expand their activities within the heavy-duty industrial market, such as containers, railcars, pipelines, the petrochemical industry and wastewater treatment.

The Hempel U.S. operation will continue to be operated out of the Hempel U.S. Corporate Headquarters in Rutherford, N.J., supported by major branch offices in Miami, New Orleans, Houston, Los Angeles, Seattle and 16 stock points in the USA and Canada.

For more information and free literature,

Circle 65 on Reader Service Card

Grasso Oilfield Services Appoints Edward Punch Sr. Marketing Manager

Grasso Oilfield Services, Inc., Houston, Texas, recently announced the appointment of **Edward A. Punch Sr.** as marketing manager. He will be responsible for the company's marketing activities as well as the development of new business opportunities. Mr. **Punch** brings to Grasso over 25 years of experience in the international maritime and offshore marine industry.

Grasso Oilfield Services is a pioneer in the development of the integrated Marine Service Center. Through associated companies, the centers provide drilling fluids, chemicals, cement, fuel, lubricants, oilfield equipment rentals and supplies, transportation, inspection and testing as well as services for waste treatment and disposal. Grasso's deepwater Marine Service Centers, at Harbor Island, Freeport, Galveston and Sabine Pass, offer a single source of supplies and services to the offshore industry.

For more information and free literature on Grasso Oilfield Services,

Circle 57 on Reader Service Card

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

(Required by 39 U.S.C. 3685)

1. TITLE OF PUBLICATION: Maritime Reporter & Engineering News.
   A. PUBLICATION NO. 00253448
2. DATE OF FILING: October 10, 1988.
3. FREQUENCY OF ISSUE: Monthly.
   A. NO. OF ISSUES PUBLISHED ANNUALLY: 12
   B. ANNUAL SUBSCRIPTION PRICE: $44.00
4. LOCATION OF KNOWN OFFICE OF PUBLICATION: 118 East 25th Street, New York, New York 10010
5. LOCATION OF THE HEADQUARTERS OR GENERAL BUSINESS OFFICES OF THE PUBLISHERS: 118 East 25th Street, New York, New York 10010.
6. NAMES AND ADDRESSES OF PUBLISHERS AND EDITOR: PUBLISHER: John E. O'Malley, Charles P. O'Malley, Maritime Reporter/Engineering News, 118 East 25th Street, New York, New York 10010. EDITOR: John Snyder, Maritime Reporter/Engineering News, 118 East 25th Street, New York, New York 10010
7. OWNER (If owned by a corporation, its name and address must be stated and also immediately thereafter the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given.)
   Charles P. O'Malley, Maritime Activity Reports, 118 East 25th Street, New York, New York 10010. John E. O'Malley, Maritime Activity Reports, 118 East 25th Street, New York, New York 10010.
8. KNOWN BONDHOLDERS, MORTGAGEES, AND OTHER SECURITY HOLDERS OWNING OR HOLDING 1 PERCENT OR MORE OF TOTAL AMOUNT OF BONDS, MORTGAGES OR OTHER SECURITIES (If there are none, so state.) None.
10. EXTENT AND NATURE OF CIRCULATION:

	Average No. Copies Each Issue During Preceding 12 Months	Single Issue Nearest To Filing Date
A. Total no. copies printed (Net press run)	26,637	26,750
B. Paid Circulation		
1. Sales through dealers and carriers, street vendors and counter sales	None	None
2. Mail Subscriptions	25,343	25,259
C. Total Paid and/or Requested Circulation	25,343	25,259
D. Free Distribution (including samples) by mail, carrier or other means	770	916
E. Total Distribution (sum of C and D)	26,113	26,175
F. Copies not distributed		
1. Office use, left-over unaccounted, spoiled after printing	524	575
2. Returns from news agents	None	None
G. Total (sum of E & F—should equal net press run shown in A)	26,637	26,750

11. I certify that the statements made by me above are correct and complete.
    (Signed) Lilian Irvine, Assistant to Publisher

Westmont Industries Offers Eight-Page Color Brochure On Port Equipment

Westmont Industries, Santa Fe Springs (Los Angeles), Calif., is offering a free eight-page color brochure that is designed to illustrate and describe the company's capabilities in providing its customers with some of the most efficient port equipment and material handling systems available.

Among the Westmont-provided equipment discussed and illustrated with color photos in the publication are the traveling gantry shiploader for Koppel Bulk Terminal at the Port of Long Beach, Calif.; four banana unloading gantries for Standard Fruit And Steamship Company, Port of Long Beach; seven mobile gantry structures for Dunbar Kapple at various ports on the coasts of Africa; a barge unloader system for Jersey Miniere Zinc Co., near Clarksville, Tenn.; ship unloaders and conveyors installed by Westmont for National Gypsum, Port of Long Beach; and miscellaneous large bulk handling systems for the conveying and processing of coal and bauxite.

For further information and a free copy of the brochure, "Port Equipment—Material Handling Systems, Ship Loaders/Unloaders," fromWestmont Industries,

Circle 40 on Reader Service Card

FOR MORE INFORMATION
ON
EQUIPMENT AND SERVICES ADVERTISED IN THIS ISSUE

CIRCLE THE APPROPRIATE NUMBER ON READER SERVICE CARD OPPOSITE →

ADVERTISER	EQUIPMENT /SERVICE	CIRCLE NO.
ALDEN	MARINE FAX	181
ASTILLEROS ESPANOLES	SHIP REPAIR	184
ATLANTIC MARINE EXPO	TRADE SHOW	204
AVONDALE, BOAT DIV	SURFACE-EFFECT PASSENGER FERRIES	271
BLOUNT	SHIPBUILDING	154
CINCINNATI GEAR	MARINE GEARS	240
COMSAT	COMMUNICATIONS EQUIPMENT	205
CRANDALL DRYDOCK	MARIT CHAIN	144
CUMMINS	GENSETS	291
CLEMENT E. DALEY	MARINE ARTIST	254
DEL GAVIO	HYDRAULICS	155
DIESEL AMERICA	DIESEL PUMPS	256
ELDEC	ELECTRONIC SWITCHES	164
EVERPURE	WATER PURIFICATION SYSTEMS	168
FCS	CERAMIC COATED COMBUSTION COMPONENTS	208
FERNSTRUM	GRID COOLER	165
FINCANTIERI	SHIPBUILDING/REPAIR	239
FURUNO	COLOR RADAR	303
GE NAVAL & TURBINE DRIVE SYSTEMS	PROPULSION EQUIPMENT	350
GENSTAR STONE PRODUCTS	BALLAST-CRETE	214
GIBBS & COX	NAVAL ARCHITECTS	265
HBC	BARGE BUILDING	218
HYUNDAI	SHIPBUILDING	325
INTERNATIONAL MARITIME ASSOCIATES	MARKETING INFORMATION SERVICES	128
INTERNATIONAL PAINT	COATINGS	193
INVENTORY LOCATOR SERVICE	CROSS REFERENCE/PARTS DATA BASE	258

ADVERTISER	EQUIPMENT /SERVICE	CIRCLE NO.
JIM'S PUMP	PUMP REPAIR	332
KELVIN HUGHES	RADAR SYSTEMS	201
LOEFFLER	VALVES, DECK DRAINS, BELLS	112
McELROY	DECK MACHINERY	138
MAN B-W DIESEL	DIESEL ENGINES	310
MAN GHH	DRY DOCKS	330
MMC INTERNATIONAL	GUAGING TAPE	296
MARKEY	DECK MACHINERY	348
MICROPHOR	SEPARATORS/SANITATION DEVICES/SUMPS/PUMPS	199
NAMCO CONTROLS	LIMIT SWITCHES	301
J.D. NEUHAUS	HOISTS	170
NORTHWEST MARINE IRONWORKS	SHIP REPAIR	234
PORT OF IBERIA	PORT SERVICES	284
RED FOX COMPANIES	SANITATION DEVICES	294
RENK	MARINE GEARS	245
SEAWARD	SEA CUSHION FENDERS	146
SIMS PUMP VALVE	VALVE COMPONENTS	196
SPERRY	INTEGRATED BRIDGE SYSTEM	278
STAL REFRIGERATION	AIR CONDITIONING SYSTEM	241
3. MAJ	SHIP BUILDING	169
TFC	WASTE COMPACTORS	264
TEXACO	MARINE LUBE OILS	249
TRIMBLE	NAVIGATION SYSTEMS	279
U.S. BORAX	FUEL FUNGICIDE	312
VSE	MARINE DESIGN SERVICES	287
WARTSILA DIESEL	DIESEL ENGINES	300
WESTMONT	PORT EQUIPMENT	339
ZIDELL	BARGES	178

Sperry Marine To Distribute Northstar Computerized Loran-C Navigators

Sperry Marine Inc., one of the world's leading manufacturers and distributors of marine electronics, has agreed to distribute the "Northstar 800" Series of Computerized Loran-C Navigators manufactured by Digital Marine Electronics Corp. of Acton, Mass. The announcement was made recently by **John V. DeMaso**, Sperry Marine vice president for commercial marketing.

"We are pleased to be able to offer these outstanding Loran-C navigators directly to our customers," Mr. **DeMaso** said, "especially our yacht and fishing boat customers. The Northstar computerized Loran-C navigators, recognized by mariners as the industry standard, have proved to be the most accurate, user-friendly Loran-C navigators on the market. We are particularly impressed by the Northstar 800's superior accuracy in Lat/Long by automatically correcting ASF and, with its dynamic range of more than one trillion to one, reading signals where other Loran-C units can't."

The "Northstar 800" Series of computerized Loran-C navigators, manufactured by Digital Marine Electronics Corp., will be distributed by Sperry Marine Inc.

Mr. **DeMaso**, in his announcement, noted that the Northstar 800 Loran Navigator includes over 20 direct-to-device interfaces, 40+ navigation features and 120 possible waypoints. The unit is self-contained, splash-proof, and encased in a rugged aluminum housing that is "angled" to permit overhead, horizontal or vertical mounting. The Northstar 800X Loran Navigator can run one or two waterproof control heads in parallel operation.

In his acknowledgment of the new distribution agreement, **Charles Malaquias**, president of Digital Marine, said, "I am confident that Digital Marine's reputation for quality, combined with Sperry's well-organized network of worldwide dealers, will result in a very effective and exciting distribution team for out line of dependable Northstar navigators."

Sperry Marine Inc., headquartered in Charlottesville, Va., has over 200 sales and service offices worldwide.

For more information and free literature,

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 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, on companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR assumes no responsibility for errors. **If you are interested in having your company listed in this Buyers Directory Section, contact John C. O'Malley at (212) 477-6700.**

AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION'
Adrick Marine Corp., 320 Cantor Ave., Linden NJ 07036
Bailey Refrigeration Co., Inc, 2323 Randolph Avenue, Avenel, NJ 07001
Stal Refrigeration AB, Butangsgatan 16, S-60187 Norrkoping SWEDEN

BALLAST
Genstar Stone Products, Executive Plaza IV, Hunt Valley, MD 21031
Mineral Research & Recovery Inc., 4565 S. Palo Verde, Ste 203, Tucson AZ 85714

BARGE BUILDING
HBC Barge, Brownsville PA 15417

BARGES—Leasing
McDonough Marine Service, P.O. Box 1825, Parkersburg WV 26101

BASKET STRAINERS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

BEARINGS—Rubber, Metallic, Non-Metallic
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Kingsbury Inc., 10385 Drummond Rd, Philadelphia PA 19154
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, OH 44309

BOILERS
Combustion Engineering, Inc., Windsor, CT 06095

BOILER CLEANING
Asea Stal, 50 Chestnut Ridge Rd., Montvail N.J. 07645
Infrasonik AB (an ASEA Stal Co.). S-612 20 Finspong, SWEDEN

BROKERS
Captain Astad Company, Inc., P.O. Box 350486, Ft Lauderdale FL 33335; P.O. Box 1093, Houma, LA 70360
Bergeron & Associates, P.O. Box 726, Chalmette LA 70044
Jack Faulkner Inc., 2419 Caddy Lane, P.O. Box 371, Flossmoor IL 60422
Mowbray's Tug & Barge Sales Corp., 35 De Hart St., Morristown NJ 07960
Ocean Marine Brokerage Services, P.O. Box 1257, Port Canaveral, FL 32927

BULKHEADS
The Waugh Co./Rockment (TNF), 5111-6 Baymeadows Rd., Suite 394, Jacksonville, FL 32217

CARGO ACCESS EQUIPMENT
Morgan Crane Co., Inc. (Hiab SeaCranes and QMC Trident, Ferrari, Fassi marine cranes), 1009 E. Chestnut Ave., Santa Ana CA 92701

CARGO HANDLING SYSTEM
Skarpenord A/S, US Agent: American United Marine Corp., 5 Broadway, Rte 1, Saugus MA 01906

CHAIN
Baldt Inc., P.O. Box 350, Chester PA 19106
Crandall Dry Dock Engineers Inc./Marit Chain, 21 Pottery Lane, Dedham MA 02026
Milligan Marine Supply Inc., 5832 Harvey Wilson, Houston TX 77020

CHOCKING COMPOUND
Philadelphia Resins Corp., 130 Commerce Dr., Montgomeryville, PA 18936

COMPACTORS
ICI Multi-Pak Inc., 14719 Carolcrest, Houston TX 77079

COMPUTERIZED INFORMATION SYSTEMS
TIMSCO, P. O. Box 91360, Mobile AL 36691

CONDENSERS/SEPARATORS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130
Wright Austin Co., 3250 Franklin St., Detroit MI 48207

CONTROL SYSTEMS—Monitoring
ASEA, Inc., 4 New King St., White Plains, NY 10604
Eldec Corporation, 16700 13th Ave. West, P.O. Box 100 Lynnwood, WA 98036
Imo-Delaval, Inc., Gems Sensors Division, One Cowles Rd., Plainville CT 06062
Indikon Division, Metravib Instruments Inc., 26 New St., Cambridge, Ma 02138
NAMCO Controls, 7567 Tyler Blvd, Mentor OH 44060
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Valmet Automation A.S., P.O. Box 130, N-3430, Spikkestad, Norway
WABCO, 1953 Mercer Rd., Lexington KY 40511

CRANES—HOISTS—DERRICKS—WHIRLEYS
ASEA-Hagglund, Inc., 50 Chestnut Ridge Rd., Montvale NJ 07645
The Crosby Group, Inc., P.O. Box 3128, Tulsa OK 74101
Del Gavio Marine Hydraulics Inc., 207 W. Central Ave., Maywood NJ 07607 telex: 132610 DELMARINE
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
Morgan Crane Co., Inc. (Hiab SeaCranes and QMC Trident, Ferrari, Fassi marine cranes), 1009 E Chestnut Ave., Santa Ana CA 92701
J.D. Neuhaus, Hebezeuge, D5810, Witten Heven, West Germany
Pettibone-Tiffin Corp., 235 Miami St., Tiffin, OH 44883

DECK MACHINERY—Cargo Handling Equipment
Braden Carco Gearmatic, P.O. Box 547, Broken Arrow, OK 74013
Gearmatic—see 'Braden Carco Gearmatic' above.
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, WA 98134
McElroy Machine & Mfg. Co., Inc., P.O. Box 4455, Biloxi MS 39535
Morgan Crane Co., Inc. (Hiab SeaCranes and QMC Trident, Ferrari, Fassi marine cranes), 1009 E Chestnut Ave., Santa Ana CA 92701
Schoellhorn-Albrecht, P.O. Box 22110, St Louis MO 63116

DIESEL ACCESSORIES—CYLINDER LINERS
Acurex Corporation, Autodata Division, 555 Clyde Ave., P.O. Box 7042, Mountain View, CA 94039
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Diesel America Inc., 5217 River Rd., New Orleans LA 70123
FCS Inc., 22 Main St., Center Brook CT 06409
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, MA 02360
Kiene Diesel Accessories, 325 S. Fairbanks St., P.O. Box 386, Addison IL 60101

DIESEL ENGINE—Spare Parts & Repair
Bergen Diesel A/S, P.O. Box 924, N-5001 Bergen NORWAY
Bergen Diesel Inc., 2701 Delaware Ave., Kenner LA 70062
Chrome Locomotives, P.O. Box 197, Silvis IL 61282
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Cummins Engine Co., Inc., Mail Code 40642, Box 3005 Columbus, IN 47202-3005
Goltens, 160 Van Brunt St, Brooklyn NY 11231
MAN B&W Diesel GmbH, Stadtbachstrasse 1, D-8900 Augsburg 1, Federal Republic of Germany
MAN B&W Diesel, 50 Broadway, 18th Fl., New York, NY 10004
Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, Federal Republic of Germany
Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166

DIVING & SALVAGE
H.J. Merrihue, P.O. Box 23123, New Orleans LA 70183
Muldoon Marine Services, P.O. Box 3221, Terminal Island, CA 90731
Parker Diving Service Inc., Berth 69, Los Angeles Harbor, P.O. Box 5272, San Pedro CA 90733

ELECTRICAL EQUIPMENT
Eldec Corporation, 16700 13th Ave West, P.O. Box 100, Lynwood WA 98036
SPD Technologies, 13500 Roosevelt Blvd, Philadelphia PA 19116
Ward Leonard Electric, 31 South St., Mt. Vernon, NY 10550
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

ELECTROMAGNETICS
Sentel Corp., 6713 Robinia Rd., Camp Springs MD 20748

ELECTRONIC INFORMATION SYSTEMS
Inventory Locator Service Inc., 3820 Premier Ave., Memphis TN 38118

ELECTRONIC SYSTEMS
Marine Electric RPD, Inc., 666 Pacific St., Brooklyn, NY 11217 TX: 125327

ENGINE TEST EQUIPMENT
General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Road, Plymouth, MA 02360

EQUIPMENT—Marine
Atlas Copco Rental, 70 Demarest Dr., Wayne, NJ 07470
Thomas Caudon Associates, 6655 Amberton Dr., Baltimore, MD 21227
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, NY 10550
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302
Space Machine & Engineering Corp., 2346 16th Ave North, St Petersburg FL 33713

EVAPORATORS
Atlas-Danmark Desalination Systems A/S, Stamholmen 93, 2650 Hvidovre (Copenhagen), Denmark
Equipment Engineering, 666 Baker St., #265, Costa Mesa CA 92626
MECO (Mechanical Equipment), 861 Carondelet St., New Orleans LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

FANS—VENTILATORS—BLOWERS
Carling Turbine Blower Company, 10 Nebraska St., P.O. Box 88, Worcester MA 01613
Flebu A/S, US Agent: American United Marine Corp., 5 Broadway, Rte 1, Saugus MA 01906
Jon M. Liss Associates, Inc., 411 Borel Ave., P. O. Box 5554, San Mateo, CA 94402

FASTENERS
Action Threaded Products Inc., 6955 S. Harlem, Bedford Park, IL 60638
Band-It Division, Houdaille Industries Inc., P.O. Box 16307, Denver CO 80216
Hardware Specialties Co., Ships Division, 48-75 36th St, Long Island City NY 11101
Lee Brass Company, P. O. Box 1229, Anniston AL 36202
Mapeco Products, Inc., 725 Glen Cove Ave., P.O. Box 6, Glen Head NY 11545
Non-Ferrous Bolt & Mfg Co., 4085 Nevso Dr., Suite C, Las Vegas NV 89103
Okabe Co., Inc., 175 Lively Blvd., Elk Grove Village, IL 60007

FENDERING SYSTEMS/BUOYS—Dock & Vessel
Intertrade Ltd., Marine Products Div., 15301 Transistor Lane, Huntington Beach CA 92649
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Milligan Marine Supply Inc., 5832 Harvey Wilson, Houston TX 77020
Schuyler Manufacturing, 16901 Woodinville-Redmond Rd, Woodinville WA 98072
Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook VA 22624

FILTERS
Parker Filter Division, 16810 Fulton County Rd., #2, Metamora, OH 43540

FUEL ADDITIVE
U.S. Borax, Industrial Chemicals, 3075 Wilshire Blvd., Los Angeles CA 90010

FURNITURE
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001

GALLEY EQUIPMENT
Gaylord Industries, 10900 S W Avery St, P.O. Box 1149, Tualatin, OR 97062

GANGWAYS, LADDERS
A.L. Don, 1 Don Plaza, Dock St., Matawan NJ 07747
National Specialty Products, 5727 Heffernan St., Houston TX 77087
Rampmaster Inc., 9825 Osceola Blvd., Vero Beach, FL 32960
Westmont Industries, 10805 Painter Ave., Santa Fe Springs, Los Angeles, CA 90670
Wooster Products Inc., 1000 Spruce St., P.O. Box 896, Wooster, OH 44691

HEAT EXCHANGERS
Alfa Laval Inc., 2115 Linwood Ave., Fort Lee NJ 07024
ITT Standard Heat Transfer Technology, Buffalo, NY 14240
MECO (Mechanical Equipment), 861 Carondelet St., New Orleans LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

HORNS/WHISTLES
Kahlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241

HYDRAULICS
Aeroquip Corporation, 300 South East Ave., Jackson, MI 49203
Cunningham Marine Hydraulics Co., 201 Harrison St., Hoboken NJ 07030
Del Gavio Marine Hydraulics Inc., 207 W Central Ave., Maywood NJ 07607; telex: 132610 DELMARINE
Parker Hannifin Corporation, 17325 Euclid Avenue, Cleveland, OH 44112

INCINERATORS
Teamtec A/S, P.O. Box 100, N-4912 Gjeving, NORWAY
A/S Vesta, 27 Skudehavnsvej, DK-2100 Copenhagen DENMARK. US Agent: American United Marine, 5 Broadway, Rte 1, Saugus MA 01906

INSTRUMENTATION
Technical Services Group, 2900 Main St., Alameda CA 94501

INSULATION—Cloth, Fiberglass
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
Duracote Corp., 350 North Diamond St., Ravenna, Ohio 44266
Soundcoat, One Burt Drive, Deer Park NY 11729

JOINER—Watertight Doors—Paneling—Ceiling Systems
Astech, 3030 S. Red Hill Ave., Santa Ana, CA 92711
Bailey Distributors, Inc., 2323 Randolph Avenue, Avenel, NJ 07001
Simpson Timber Co., Third & Franklin, Shelton WA 98584
Walz & Krenzer Inc., 1390 Mt. Read Blvd., Rochester NY 14606

KEEL COOLERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
The Walter Machine Co., Inc., 84-98 Cambridge Avenue, Jersey City, NJ 07307

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
Carlisle & Finch, 4562 W. Mitchell Ave., Cincinnati OH 45232
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209

LINE BLINDS
American Piping Products Inc., Box 1056, New Hyde Park, NY 11040
Stacey/Fetterolf, P.O. Box 103, Skippack, PA 19474

LOGISTICS
VL Logistic Consultants, Inc., 3008-C Bienville Blvd., Ocean Springs MS 39564

LUBE-OIL CENTRIFUGES
Keith Dixon Warehouse Supplier, Authorized distributor for Spinner II, 650 Whitehead Rd., Lawrenceville NJ 08648
Hamworthy Engineering Ltd., Fleets Corner, Poole, Dorset, BH17 7LA ENGLAND
Spinner II Products, T.F. Hudgins, Incorporated, P.O. Box 920946, Houston, TX 77292

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
AMT, Inc., 2400 NW 39th Ave., Miami Fl 33142
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DELMARINE
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
In-Place Machining Co., 1929 North Buffum St., Milwaukee WI 53212

MARINE LUMBER
McCausey Lumber Company, 36325 Harper Ave., P.O. Box 46129, Mt Clemens MI 48046

MEDICAL SUPPLIES
Universal Marine Medical Supply, 69-06 3rd Ave., Brooklyn NY 11209

METAL MARKERS/LETTERS
Johnston Brothers Enterprises, Inc., P.O. Box 1138, Patterson, LA 70329
J. P. Nissen Company, P.O. Box 188, Glenside PA 19038

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Hwy., Arlington, VA 22202
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Professional Captains Association, P.O. Box 350398, Ft. Lauderdale FL 33316
American Systems Engineering Corp., P.O. Box 8988, Virginia Beach, VA 23452
Amirikian Engineering Co., P.O. Box 15210, Chevy Chase MD 20815
Armorica Sales Inc., 2 Marineview Plaza, Hoboken NJ 07030
B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C. Canada V6S 2L2
CDI Marine Co., 900 Regency Square Blvd., Suite 203, Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829
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, 3100 Ridgelake Dr., Suite 101, Metairie LA 70002
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, 2011 Crystal Dr., Arlington VA 22202
E.Y.E. Marine Consultants, Belmont House, 33 Alderney Dr., Suite 350, Dartmouth, NS CANADA B2Y 2N4
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
GHM Inc. (Industrial Measurement Consultants), P.O. Box 1836, Newport News, VA 23601
Gibbs & Cox, Inc., 119 West 31st Street, New York, NY 10001
John W. Gilbert Associates, Inc., 66 Long Wharf, Boston, MA 02110
The Glosten Associates Inc., 600 Mutual Life Bldg., 605 First Ave., Seattle, WA 98104
Morris Guralnick Associates, Inc., 620 Folsom Street, Suite 300, San Francisco, CA 94107
Hi-Test Laboratories, Inc., P.O. Box 226, Buckingham C.H., VA 23921
C. Raymond Hunt Associates, 69 Long Wharf, Boston MA 02110
Hydrocomp, Inc., 45 James Farm-Lee, P.O. Box 865, Durham, NH 03824
Intramarine, Inc., P.O. Box 53043, Jacksonville, FL 32201
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
Clyde Leavitt Inc., 13901 Puerto Dr, Ocean Springs MS 39564
K.P.G. Integrated Engineering Pty Ltd., P. O. Box 525, Cairns, Qld. 4870 AUSTRALIA
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi, MS 39535-4454
John J. McMullen Associates, Inc., 1 World Trade Center, New York, NY 10048
MacPherson Maritime Services, 141 Jefferson Ave., Westfield NJ 07090
Fendall Marbury, 9 Neal Street, Annapolis MD 21401
Marine Management Systems Inc., 102 Hamilton Ave., Stamford CT 06902
Marine Power Associates, 1010 Turquois St., Ste 217, San Diego, CA 92109
Maritime Design, Inc., 2955 Hartley Rd., Jacksonville, FL 32217
R.J. Mellusi & Co., 71 Hudson St, New York, NY 10013
Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
Nord Marine Inc., P.O. Box 305, Fair Haven NJ 07701
Northern Marine, P.O. Box 1169, Traverse City, MI 49685
Ocean Oil International Engineering Corp., 3019 Mercedes Blvd, New Orleans LA 70114
Capt. H.L. Olsen, Marine Surveyors Company, P.O. Box 283, Port Jefferson NY 11777
Q.E.D. 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, 3770 16th Street North, St. Petersburg, FL 33704
Seaworthy Systems Inc., P.O. Box 338, Essex, CT 06426; 17 Battery Pl., New York, NY 10004; P.O. Box 205, Solomons MD 20688; 2 Skyline Pl., 5203 Leesburg Pike, Falls Church VA 22041.
Seaworthy Electrical Systems, 17 Battery Pl. N.Y. N.Y. 10004
George G. Sharp, Inc., 100 Church St., New York, NY 10007

T.W. Spaetgens, 156 W. 8th Ave., Vancouver BC CANADA V5Y 1N2
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
Systems Engineering Associates (SEACOR), 200 East Park Dr., Suite 600, Mt Laurel NJ 08054
TIMSCO, P. O. Box 91360, Mobile AL 36691
Tracor Hydronautics, Inc., 7210 Pindell School Rd., Laurel, MD 20707
VSE Corporation, 1417 No Battlefield Blvd, Chesapeake VA 23320

NAVIGATION & COMMUNICATIONS EQUIPMENT
Atkinson Dynamics, 10 W Orange Ave., So San Francisco CA 94080
Comsat Maritime Services, 950 L'Enfant Plaza SW, Washington DC 20024
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
General Electric Company, Mobile Communications Division, Lynchburg, VA 24502
Harris Corporation, RF Communications Group, 1680 University Ave., Rochester NY 14610
Henschel Corporation, 9 Hoyt Dr., P.O. Box 30, Newburyport MA 01950
ITT Mackay, 441 U.S. Highway #1, Elizabeth, NJ 07202
Kelvin Hughes Ltd., New North Rd., Hainault, Ilford, Essex 1G6 2UR England
Mackay Communications, 441 US Hightway #1, P.O. Box 331, Elizabeth NJ 07207
Marine Electric RPD Inc., Galbraith Pilot Marine Div., 666 Pacific St., Brooklyn NY 11217
Naval Electronics, 5417 Jetview Circle, Tampa FL 33634
Norcontrol Simulation A/S, Bekkajordet 8A, P.O. Box 1024, N-3191 Horten NORWAY
Ocean Satellite Televion Ltd., Avmar House, 61 Brushfield St., London E1 6AA ENGLAND
Petroleum Communications Inc. (Petrocom) Head Office: 5901 Earhart Expwy., New Orleans LA 70123; 556 Jefferson St., Suite 100, Lafayette LA 70501; Allied Bank Plaza, Suite 5440, 1000 Lousisian St., Houston TX 77002
Racal Marine Inc., 70 Jackson Dr., Cranford NJ 07016
Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033
Raytheon Marine Company, 46 River Rd., Hudson NH 03051
Raytheon Service Company, 5760 Northampton Blvd., Ste 102, Virginia Beach VA 23455
Robertson Shipmate Inc., 3000 Kingman St., Suite 207, Metairie LA 70006
S P Radio A/S, DK 9200 Aalborg DENMARK
SPT Audio, 8928 Kirby Dr., Houston TX 77054
Sperry Marine Inc., 1070 Seminole Trail, Charlottesville VA 22906
Standard Communications, P.O. Box 92151, Los Angeles CA 90009
Telesystems, 2700 Prosperity Ave., Fairfax, VA 22031 USA
Watercom Communications Systems, 453 E. Park Place, Jefferson IN 47130

OILS—Marine—Additives
B P North America Petroleum, 555 US Route 1, So. Iselin, NJ 08830
Burmah-Castrol Inc., Raritan Plaza II, Roritan Center, Edison NJ 08837
Chevron USA, 575 Market St., San Francisco, CA 94105
Exxon Company International, 200 Pork Ave., Bldg 222, Room A279, Florham Park NJ 07932
Texaco, International, 2000 Westchester Avenue, White Plains NY 10650

OIL/WATER SEPARATORS
Alfa Laval Inc., 2115 Linwood Ave., Fort Lee NJ 07024
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
FAST Systems Inc., 1717 Sublette Ave., St Louis MO 63110
Microphor, Inc., 452 E Hill Rd., P.O. Box 1460, Willits, CA 95490

PAINTS—COATINGS—CORROSION CONTROL
American Abrasive Metals Co., 460 Coit St, Irvington NJ 07111
International Paint, P. O. Box 920762, 6001 Antoine Dr., Houston TX 77292
Palmer International, P.O. Box 8, Worcester, PA 19490
Unitor Ships Service, Unitor Marine Chemicals Division, 3 High St., Rickmansworth, Herts, WD3 1SW UNITED KINGDOM
White Metals Inc., 6300 Midvale, Houston TX 77087

PIPE-HOSE—Cargo Transfer Clamps, Couplings, Coatings, Supports
Aeroquip, 300 South East Ave., Jackson, MI 49203
Deutsch Metal Components, 14800 S. Figueroa, Gardena, CA 90248
Stauff Corporation, 21-23 Industrial Park, Waldwick NJ 07463

PORT SERVICES
Port of Iberia, P.O. Box 897, New Iberia LA 70561

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
ASEA Brown Boveri, 1460 Livingston Ave., North Brunswick NJ 08902
Bird Johnson Company, 110 Norfolk St., Walpole, MA 02081
Bergen Diesel A/S, P.O. Box 924, N-5001 Bergen NORWAY
Bergen Diesel Inc., 2701 Delaware Ave., Kenner LA 70062
Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Caterpillar In., Engine Division, 100 N E Adams, Peoria IL 61629
Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati, OH 45227
Colt Industries Inc. (Fairbanks Morse Engine Div.), 701 Lawton Avenue, Beloit, WI 53511
Combustion Engineering, Inc., Windsor, CT 06095
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Fincantieri, Diesel Engines Division—GMT, Bagnoli della Rosandra 334, Trieste, ITALY
GE Naval & Drive Turbine Systems Department, 166 Boulder Dr., Fitchburg MA 01420
General Motors, Electro-Motive Division, LaGrange, IL 60525
KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada
KaMeWa, P.O. Box 1010, S-681 01 Kristinehamn, SWEDEN
Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Krupp MAK Maschinenbau GmbH, P.O. Box 9009, D-2300 Kiel 17, WEST GERMANY
Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323
Marine Gears, Inc., P.O. Box 689, Greenville MS 38707
Markisches Werk, Halve, P.O. Box 1442, D-5884 Halver WEST GERMANY
MAN B&W Diesel, 50 Broadway, New York, NY 10004
MAN B&W Diesel A/S, Ostervej 2, DK-4960 Hoelby, Denmark
MAN B&W Diesel A/S, Alpha Diesel, Niels Juels Vej 15. DK-9900 Frederikshavn Denmark
MAN B&W Diesel GmbH, Stadtbachstrasse 1, D-8900 Augsburg 1 Germany
MAN High Performance Diesels (Nurnberg), 160 Van Brunt St., Brooklyn NY 11231
Michigan Wheel Corp., 1501 Buchabab Ave., SW, Grand Rapids MI 49507
Morrison-Knudsen Company, Power Systems Division, P.O. Box 1928, Rocky Mount NC 27801
MTK Magnetek Inc., 11111 Santa Monica Blvd., Los Angeles CA 90025
North American Marine Jet P.O Box 1232 Benton, AR 72015
Northwest Marine Services Corp., 6452 So. 144th St., Tukwila WA 98168
Schottel-Werft, Josef Becker GmbH, KG, D-5401 Spay, WEST GERMANY
Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland
Sulzer/Escher Wyss, Ravensburg WEST GERMANY
Ulstein International A/S, N-6065 Ulsteinvik, NORWAY
Ulstein Maritime Ltd., 96 North Bend Street, Coquitlam BC CANADA V3K 6H1
J.M. Voith GmbH, Marine Division, Postfach 1940, 7920 Heidenheim/Brenz, WEST GERMANY Voith Schneider America Inc., 121 Susquehanna Ave., Great Neck, NY 11021
Wagner Engineering Ltd., 40 Gostick Pl., No Vancouver BC CANADA V7M 3G2
Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072
ZF of North America, Marine Sales, 500 Barclay Blvd, Lincolnshire IL 60069

PUMPS—Repairs—Drives
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL-MARINE
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
Imo-Delaval, Inc., IMO Pump Division, Box 447, Monroe NC 28810
Jim's Pump Repair, 48-55 36th St., Long Island City NY 11101
Leistritz Corporation, 165 Chestnut St., Allendale NJ 07401
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
Vita Motivator, 99 W Hawthorne Ave., Suite 622, Valley Stream NY 11580
Wilden Pump & Engineering Co., 22060 Van Buren St., P.O. Box 845, Colton, CA 92324

REFRIGERATION
Bailey Refrigeration Co., 2323 Randolph Ave., Avenel NJ 07001

ROPE—Manila—Nylon—Hawsers—Fibers
Allied Signal Inc., Fibers Division, 1411 Broadway, New York, NY 10018
American Manufacturing Co., Cordage Div., P.O. Box 52125, Lafayette LA 70505
Samson Ocean Systems, 2090 Thornton St., Ferndale WA 98248

SANITATION DEVICES—Pollution Control
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
FAST Systems Inc., 1717 Sublette Ave., St Louis MO 63110
Microphor, Inc., 452 E Hill Rd., P.O. Box 1460, Willits CA 95490
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
Juniper Industries, 72-17 Metropolitan Ave., Middle Village, NY 11379
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

SHIPBREAKING—Salvage
The River Smelting & Refining Co., 4195 Bradley Rd Cleveland OH 44109
The Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

SHIPBUILDING EQUIPMENT
American Marine, P.O. Box 8126, New Orleans LA 70182
Eckold Ltd., CH-7203 Trimmis, SWITZERLAND
Hilman Inc., 2604 Atlantic Ave., Wall, NJ 07719
M.A.N.—GHH, Sterkrade Werfsrabe 112 D-4100 Duisburg 18, West Germany
MAN—GHH, P.O. Box 110240, D-4200 Oberhausen 11, West Germany
NEI Syncrolift, Inc., 8970 S W 87th Ct., Miami FL 33176
Portable Gun Drilling Systems Inc., P.O. Box 123, Auburn WA 98071

SHIPBUILDING—Repairs, Maintenance, Drydocking
Aluminum Boats Inc., 304 Midway Dr., River Ridge LA 70123
Astilleros Espanoles S.A., Padilla 17, 28006 Madrid, SPAIN
Avondale Industries Inc., P.O. Box 50280, New Orleans LA 70150
Bay Shipbuilding Corp., 605 N. 3rd Ave., Sturgeon Bay, WI 54235
Blount Marine, Box 368, Warren RI 02885
Bollinger Lockport & Larose, P.O. Box 250, Lockport LA 70374
Brodosplit Shipbuilding Industry, Put Udarnika 19, P.O. Box 17, 58000 Split YUGOSLAVIA
Burmeister & Wain Skipsvaerft A/S, P.O. Box 2122, Refshaleoen, DK 1015 Copenhagen, DENMARK
Curacao Drydock (U.S.A.) Inc., 26 Broadway, Suite 741, New York, NY 10004
Danyards A/S, P.O. Box 719, DK-9900 Frederikshavn DENMARK
Equitable Shipyards Inc., Trinity Marine Group, Box 29266, New Orleans LA 70189
Fincantieri SpA Cantieri Navali Italiani, Via Cipro 11, 16129 Genoa ITALY
Houston Ship Repair, 1621 Woods Dr., P.O. Box 489, Channelview, TX 77530
Hyundai Corporation, ShipSales Dept., 140-2 Kye dong, Chongro-ku, Soeul, KOREA
Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, KOREA
Keppel Shipyard Limited, 325 Telok Blangah Road, P.O. Box 2169, Singapore 0409
Koch Ellis Barge & Ship Service, P.O. Box 9130, Westwego, LA 70094
Paul Lindenau GmbH, & Co., Schiffswerft u. Maschinenfabrik, D-2300 Kiel-Friedrichsort, West Germany
Lisnave, Apartado 2138, 1103 Lisbon, Codex PORTUGAL
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, WA 98134
M.A.N. GHH Sterkrade, P.O.B. 110240, D-4200 Oberhausen 11, West Germany
Marco, Inc., 2300 W Commodore Way, Seattle, WA 98199
Marinette Maine Corporation, Marinette, WI 54143
Munson Manufacturing, 150 Dayton, Edmonds WA 98020
Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607
Northwest Marine Ironworks, P. O. Box 3109, Portland OR 97208
SeaArk, P.O. Box 210, Monticello AR 71655
Service Marine Industries, P.O. Box 3606, Morgan City LA 70381
Southwest Marine, Inc., P.O. Box 13308, San Diego, CA 92113
3 Maj Associates Shipbuilding Industry, P. O. Box 117, 51001 Rijeka YUGOSLAVIA
Trinity Marine Group, Box 29266, New Orleans LA 70189
Wartsila Marin Industri AB, P.O. Box 1090, SF 00101 Helskini, FINLAND
Zidell Explorations, Inc., 3121 S.W. Moody Street, Portland, OR 97201
Zodiac of North America Inc., Thompson Creek Rd., P.O. Box 400, Stevensville, MD 21666

SHIP MANAGEMENT
Texaco Marine Servcies Inc., P. O. Drawer 1028, Port Arthur, TX 77641

SIMULATOR TRAINING
Marine Safety International, Marine Air Terminal, LaGuardia Airport, NY 11371

SILENCERS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

STUFFING BOXES
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

SURVIVAL EQUIPMENT
Parkway/Imperial, 241 Raritan St., So. Amboy, NJ 08879
Viking Life Saving Equipment (America) Inc., 38 NW 11th St., Miami FL 33136

TANK CLEANING
Houston Ship Repair, 1621 Woods Dr., P.O. Box 489, Channelview, TX 77530

TANK LEVELING INDICATORS
Imo-Delaval, Inc., Gems Sensors Division, One Cowles Rd., Plainville CT 06062
King Engineering Corp., P.O. Box 1228, Ann Arbor MI 48106
MMC International (Marine Moisture Control), 60 Inip Dr, Inwood NY 11696
Saab Tank Control, 201 W Passaic St., Rochelle Park NJ 07662

TORSIONAL VIBRATION SPECIALISTS
T.W. Spaetgens, 156 W. 8th Ave., Vancouver, Canada, V5Y 1N2

TOWING—Barges, Vessel Chartering, Lighterage, Salvage, etc.
Curtis Bay Towing, World Trade Center, Suite 800, Baltimore MD 21202
Jack Faulkner, 1005 W. Harimaw Ct., Metairie, LA 70001
McAllister Bros., Inc., 17 Battery Pl., New York, NY 10004

VALVES AND FITTINGS
Aeroquip, 300 South East Ave., Jackson, MI 49203
Cajon Co., 9760 Shepard Rd., Macedonia, OH 44056
Chemiquip Products Co., Inc., 3 W. 18th St., New York, NY 10011
Circle Seal Controls, Brunswick Corporation, P.O. Box 3666, Anaheim, CA 92803
Cla-Val Co., P.O. Box 1325, Newport Beach, CA 92663
Crawford Fitting Company, 29500 Solon Road, Solon, OH 44139
Deutsch Metal Components, 14800 S. Figueroa, Gardena, CA 90248
Elliott Manufacturing Co., Inc. (Remote Valve Operating Equipment), P.O. Box 773, Binghamton, NY 13902
Stanley G. Flagg Co., 1020 W High St, Stowe PA 19464
Lexair Inc., Airmatic/Beckett, 299 Gold Rush Rd., Lexington KY 40503
Loeffler Machine, US #1 & Robbins Ave., Penndel PA 19047
Newman's Inc., 7500 E Redding Place, Box 1856, Tulsa OK 74101
Nupro Co., 4800 E. 345th St., Willoughby, OH 44094
PBM Inc., RD 6, Box 387A, Sandy Hill Rd, Irwin PA 15642
Pancoast Marine Division, Front & Porter St., Philadelphia, PA 19148
Parker Hydraulic Valve Division, 520 Ternes Avenue, Elyria, OH 44035
Parker Actuator Division, 994B Rittman Road, P.O. Box 450, Wadsworth, OH 44281-0450
Parker Systems Division, 651 Robbins Drive, Box 3500, Troy, MI 48007-3500
Skarpenord A/S, US Agent: American United Marine Corp., 5 Broadway, Rte 1, Saugus MA 01906
Stacey/Fetterolf, P.O. Box 103, Skippack, PA 19474
Swagelok Company, 5171 Hudson Dr., Hudson, OH 44236
Tate Andale Inc., 1941 Landsdowne Rd., Baltimore, MD 21227
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Whitey Co., 318 Bishop Road, Highland Heights, OH 44143
Williams Valve Corp., 38-52 Review Ave., Long Island City NY 11101

VIBRATION ANALYSIS
DLI Engineering Corp., 253 Winslow Way West, Bainbridge Island, WA 98110
Vibranalysis Engineering Corp., 4380 S. Wayside, Suite 100, Houston TX 77087

WASTEWATER TREATMENT
EES Corporation/Omnipure, An Eltech Systems Company, 12850 Bournewood Dr., Sugarland TX 77478

WATER PURIFIERS
Alfa Laval Inc., 2115 Linwood Ave., Fort Lee NJ 07024
Atlas-Danmark Desalination Systems A/S, Stamholmen 93, 2650 Hvidovre (Copenhagen), Denmark
Everpure, Inc., 660 N. Blackhawk Dr., Westmont, IL 60559
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

WEATHER CHART RECORDERS
Alden Electronics, 40 Washington St., Westborough, MA 01581

WELDING
Miller Electric Mfg. Co., P.O. Box 1079, Appleton, WI 54912
Welding Consultants of Wisconsin, 6517 Radburn Lane, Greendale WI 53129

WIRE ROPE
Atlantic Cordage Corp., 60 Grant Ave., Carteret NJ 07008
Sling Max, P.O. Box 2068, Aston PA 19014

WIRE ROPE LUBRICATION SYSTEMS
Atlantis Services, 1057 Kings Ave., Jacksonville FL 32207
Dynalube, The Kirkpatrick Group, 415 N. Loop 12 at Pioneer Dr., P.O. Box 150907, Irving TX 75014

WINCHES AND FAIRLEADS
Braden Carco Gearmatic, P.O. Box 547, Broken Arrow, OK 74013
Fritz Culver, Inc., P.O. Box 569, Covington, LA 70434
Gearmatic—see 'Braden Carco Gearmatic' above.
Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134
Nashville Bridge Co., P.O. Box 239 Nashville TN 37202
Smith Berger Marine Inc., 516 S. Chicago St., Seattle, WA 98108

WINDOWS
Kearfott Marine Products, A Singer Co., 550 South Fulton Avenue, Mt. Vernon, NY 10550

WIRE AND CABLE
Seacoast Electric Company, Station Plaza, Rye NY 10580

Marco Chilena Expects Busy Schedule Well Into 1990

Marco Chilena, Santiago, Chile, recently reported that an already busy schedule of new construction is continuing, with new orders due to keep the yard active well into 1990.

Since early 1988, a wide range of fishing vessels have been delivered, including the 49-foot insulated harpoon and gillnet boat Andrea; the 59-foot, 60-ton capacity insulated longliner Elva S; the single-deck 134.5-foot purse seiner Claudia Alejandra which features a Caterpillar 3516 main engine, Petrel net hauler and winches manufactured by ASENAV in Chile; and the Pesquera San Miguel, which also has a Caterpillar 3516 engine, Marco Model W1060 main winch, and net hauling gear by Triplex of Norway.

Marco Chilena's next delivery will be the 144-foot Relampago, featuring a Caterpillar 3516 main engine, Reintjes WAF840 gearbox, Mathers pneumatic control system, and Furuno CS-50 Omni sonar.

For 1989, Marco Chilena has on order four 490-cubic-meter-capacity seiners which will carry the new Marco 18-inch CapsulPump fish pump.

For more information and a free color brochure from Marco Chilena,

Circle 73 on Reader Service Card

PROFESSIONAL

24 Hours A Day 7 Days A Week

AMT

Marine Emergency Service

•ENGINEERING/CONSULTING SERVICES — SURVEYING
•LASER/COMPUTER ENGINE ALIGNMENTS
•DIESEL ENGINES - STEAM - TURBINES - BOILERS
•MACHINING - IN SHOP OR IN PLACE "METRIC" AND "INCH"
•BEARING REBABBITTING - CLASS APPROVED
•HYDRAULICS - PNEUMATICS - REFRIGERATION
•STEELWORK - PIPE - MACHINERY - ELECTRICAL

AMT 2400 N.W. 39 Ave., Miami, U.S.A. FL 33142
(305) 871-4094 Telex: 512408 Telefax: (305) 871-3180 Cable: AMT MARINE
FACTORY AUTHORIZED Repairer and Spares Dealer for
Doxford
KRUPP MaK · MITSUBISHI · GMT · DETROIT DIESEL · CROSSLEY

CAPTAIN ASTAD CO. INC. SHIPBROKERS
PURCHASE & SALE OF ANY TYPE OF SHIPS
PURCHASE AGENTS ENGINE & DECK SPARE PARTS
OWNERS REPRESENTATIVE

CAPTAIN ASTAD CO. INC.
P.O. BOX 1093
HOUMA, LA 70360
PHONE 504/529-4171
FAX 504/851-7084
TELEX 6821298 "ASTAD"
JODY M. ST. GERMAIN ESKINE, V.P.

CAPTAIN ASTAD CO INC.
P.O. BOX 350486
FORT LAUDERDALE FL 33335
PHONE 305/344-3502
FAX 305/771-5214
TELEX 705722 "OPMC" FTL
CAPT. A. J. ASTAD, PRES.

DLI ENGINEERING CORPORATION

MARINE
VIBRATION ANALYSIS
NOISE CONTROL

253 Winslow Way West, Bainbridge Island, WA 98110
(206) 842-7656

Measurement, recording and analysis of mechanical, structural and electrical phenomena.

---

advanced marine
ENTERPRISES, INCORPORATED

HEADQUARTERS:
Suite 1300
1725 Jeff Davis Hwy.
Arlington, VA 22202

703 979-9200

FIELD OFFICES:
Virginia Beach
Philadelphia

PROJECT OFFICES:
At Customer Sites

SYSTEMS MANAGEMENT
Acquisition Management
Logistic Support
Systems Integration
Charles H. Piersall Jr., Division President

SHIP ENGINEERING & DESIGN
Feasibility Studies through Detail Design
Alteration & Conversion Design
Systems Engineering
Dr. Robert S. Johnson, Division President

FLEET SUPPORT & FIELD ENGINEERING
In-service Engineering
Overhaul, Repair, and Test Support
Self-help & Alteration Installation
Gordon M. Green, Division President

Ocean Engineering Centre
SHIP-MODEL TESTING
• Resistance Tests • Flow Visualization
• Wake Surveys
• Towed Directional Stability Evaluations
• Seakeeping

For Information Contact:
B.C. Research
Ocean Engineering Centre
3650 Wesbrook Mall,
Vancouver, Canada V6S 2L2
Telephone (604) 224-4331
Telex 04-507748

ARTHUR D. DARDEN
INCORPORATED
NAVAL ARCHITECTS & MARINE ENGINEERS
3100 RIDGELAKE DR. SUITE 101
METAIRIE, LOUISIANA 70002 (504) 832-3952

---

(718) 939-4422

AERO NAV
LABORATORIES, INC.

14-29 112th Street, College Point, N.Y. 11356
Navy-Hi Shock, Vibration & A.B.S. Testing

PUSHBOATS, TUGS, CREWBOATS, TENDERS
BARGES OF ALL TYPES, INLAND OR OFFSHORE
WILLIAM T. BERGERON
BERGERON & ASSOCIATES
MARINE BROKERS
(504) 271-7171
P.O. BOX 726 CHALMETTE, LA 70044
"IF YOU NEED IT, WE CAN FIND IT"

DESIGN ASSOCIATES, INC.
M. KAWASAKI
14360 Chef Menteur Highway
New Orleans, Louisiana 70129
Naval Architects
Marine Management
Marine Engineers
Transportation Consultants
Phone: (504) 254-2012 TWX 810-951-5317

COI marine company
PROFESSIONAL • EXPERIENCED • RESPONSIVE
SUPPORTING THE MARINE INDUSTRY WITH:
ENGINEERING SERVICES
DETAILED DESIGN
COMPUTER AIDED DESIGN
TECHNICAL PUBLICATIONS
LOGISTICS
JACKSONVILLE (904) 724-9700 · PHILADELPHIA (609) 228-1853 · NEWPORT NEWS (804) 245-0516 · PORTSMOUTH (804) 397-8000 · BREMERTON (206) 479-8828

DESIGNERS & PLANNERS, INC.
Naval Architecture – Marine Engineering
Human Factors Engineering
Newport News, VA (804) 873-0830
Cherry Hill, NJ (609) 795-1170
Bayonne, NJ (201) 339-9446
Norwich, CT (203) 887-2501
Arlington, VA (703) 892-8200
2011 Crystal Drive ■ Arlington, VA 22202

C.T. MARINE
NAVAL ARCHITECT • MARINE ENGINEER
• TUGS
• TOWBOATS
• BARGES
18 Church Street, Georgetown, CT 06829
Telephone: 203-544-8110
Telex: ITT 4994761

E.Y.E. MARINE CONSULTANTS
NAVAL ARCHITECTS • MARINE ENGINEERS
SHIP SURVEYORS • OFFSHORE ENGINEERS
Dartmouth, Nova Scotia Canada — Tel: (902) 463-8940 Fax: (902) 463-6319 Tlx: 019-22632
St. John's, Newfoundland — Tel: (709) 722-5560 Fax: (709) 722-4880

AmSEC
AMERICAN SYSTEMS ENGINEERING CORPORATION
Marine Engineers • Port Engineer Services
Systems Analysts • Propulsion Plant Training
Qualified Manufacturer's Field Representatives
P.O. Box 8988 • Virginia Beach, VA 23452 • (804) 463-6666
Philadelphia, PA • Bremerton, WA • Virginia Beach, VA
Arlington, VA • San Francisco, CA • San Diego, CA

CHILDS ENGINEERING CORPORATION
CHILDS ENGINEERING CORPORATION
Waterfront Engineering
Diving Inspection
BOX 333, MEDFIELD, MA 02052
(617) 359-8945

ENCON MANAGEMENT & ENGINEERING CONSULTANT SERVICES
Marine Structures • Engineering Analysis • Marine Survey
Project Management • Loss Prevention • Naval Architecture
P.O. Box 7760 • Beaumont, Texas 77706
(409) 866-9158

CRANDALL
DRY DOCK ENGINEERS, INC.
Railway and Floating Dry Docks
Waterfront Structures • Consulting
Design • Inspection
Dry Dock Hardware and Equipment
21 Pottery Lane Dedham, MA. 02026
Tel. (617) 329-3240 Telex: 924406

BARGES - TUGS - TOWING
CHARTERS AND SALES
(312) 798-2419
FAX (312) 798-1077

Jack Faulkner
Tug & Barge Sales

PROCUREMENT AGENTS ON INLAND AND OCEAN TOWING

2419 Caddy Lane Flossmoor, Illinois 60422
"TOWING ANYWHERE THERE IS WATER"

AMIRIKIAN ENGINEERING CO.
HARBOR AND DRYDOCKING FACILITIES
AMMI STABILIZER FOR MOORING & FLOATING & SUBMERSIBLE STRUCTURES
P.O. BOX 15210
CHEVY CHASE, MARYLAND 20815
(301) 652-6903

---

crane consultants Inc.
15301 1st Ave. So. Seattle, Washington 98148
(206) 246-7962 TWX 910-444-2085
Crane hoist, materials handling specialists

GIM INDUSTRIAL MEASUREMENT CONSULTANTS
• Industrial Photogrammetry
• Theodolite Systems
• CAD Applications
P.O. Box 1836, Newport News, VA 23601 (804) 591-9244

COATINGS—CHEMICALS—GAUGES
International Paint (U.S.A.) Inc.
Henric-Vecom (U.S.A.) Ltd.
DeFelsko Corporation
ARMORICA SALES INC.
2 Marineview Plaza • Hoboken, NJ 07030
(201) 792-7682

C. R. CUSHING & CO., INC.
NAVAL ARCHITECTS, MARINE ENGINEERS
& TRANSPORTATION CONSULTANTS
18 Vesey Street
NEW YORK, N.Y. 10007
TEL (212) 964-1180 CABLE CUSHINGCO
TX: 752481

GIBBS & COX INC
NAVAL ARCHITECTS & MARINE ENGINEERS
119 West 31st Street • New York, N.Y. 10001
(212) 613-1300

Deutz MWM Engines Power New Japanese Catamaran Built By Mitsui Engineering

The Deutz-powered Queen Rokko, built by Mitsui Engineering & Shipbuilding, is designed for 250 passengers.

Mitsui Engineering & Shipbuilding Company recently delivered the catamaran ferry Queen Rokko to Japanese shipowners Awaji Ferry Boat Company. The vessel, now in ferrying service, is about 108.9 feet long and 29.5 feet wide with a displacement of 217 tons. It is approved for coastal service and has carrying capacity of 250 passengers.

The Queen Rokko is powered by two Deutz MWM 12-cylinder engines of the 604B series, which are designed to deliver a maximum power of 1,260 kw each at a speed of 1,800 rpm, bringing the catamaran to a maximum speed of 30 knots.

For free literature giving full information on Deutz MWM engines

Circle 66 on Reader Service Card

Marine Ladders And Gangways Featured In New 38-Page Alco-Lite Catalog

Marine ladders and gangways are featured in a special section in the newest "Alco-Lite" Industrial Ladders Catalog from Carbis Sales and Aluminum Ladder Company of Florence, S.C. Included in the 38-page publication are photographs and specifications for marine boarding ladders, stage gangways and regular gangways.

In addition to a wide inventory of standard ladder and gangway styles, Aluminum Ladder Company specializes in custom work for specialized marine needs. Heavy gauge aluminum flooring with cleats and slip-resistant surface is standard on all gangways with a curved tread option available. Double-sided rope handrails are also optional on gangways, with aluminum handrails available for all gangway models and all marine ladders. All marine ladders are equipped with safety shoes/spikes with skid resistant rubber. Wheels or rollers are standard on all gangways.

Because Alco-Lite ladders and gangways are manufactured to strict quality control standards, each product bears its own serial number and the Alco-Lite logo. The serial number provides a permanent record of all parts used in the construction of that particular ladder. Alco-Lite products are repairable in the field, with replacement parts readily available.

Carbis Sales is the exclusive distributor for Alco-Lite products.

For more information and a free copy of the new catalog,

Circle 76 on Reader Service Card

Wartsila Places $7.8-Million Order For Ferry Equipment With Flaekt Marine Of Sweden

The Swedish company Flaekt Marine AB recently received an order worth $7.8 million from Finnish shipbuilder Wartsila Marine for equipment for two ferries being built for Silja Line, a Baltic operator.

Wartsila's Turku shipyard is constructing the ferries for the Silja partners, Finland Steamship and Sweden's Johnson, at a combined cost of about $350 million.

The two 2,500-passenger ships, scheduled for delivery in 1990 and 1991, will have air-conditioning and aeration equipment installed which Flaekt Marine AB will manufacture.

CLASSIFIED AND EMPLOYMENT ADVERTISING

HOW TO PLACE CLASSIFIED ADVERTISING: Mail clearly written or typed copy to: MARITIME REPORTER, 118 East 25th Street, New York, NY 10010. Include any photos, drawings or logos if required. Specify size of ad and number of insertions . . . Classified Advertising — Per Issue Rate: Classified advertising is sold at a rate of $70 per column inch . . . MARITIME REPORTER'S classified section carries more advertising and sells more products than any other publication in the marine industry. Closing date for classified advertising is 20 days prior to the date of the issue. For further details contact John C. O'Malley at (212) 477-6700. Send all advertising material to MARITIME REPORTER And Engineering News, 118 East 25th Street, New York, NY 10010.

Globe PERSONNEL CONSULTANTS
Serving the marine industry since 1973
CONTRACT, PROJECT, PERMANENT EMPLOYMENT
P.O. BOX 996 HUMBLE, TX 77347 (713) 526-3748

VICE PRESIDENT
SUBMARINE DESIGN/DEVELOPMENT

THIS POSITION REQUIRES AN ADVANCED DEGREE AND 15 YEARS EXPERIENCE IN DESIGN OF SUBMARINES WITH SOLID KNOWLEDGE OF PRESSURE VESSEL DESIGN, HYDRODYNAMICS AND ALL INTEGRATED SYSTEMS. MUST HAVE AN INVENTIVE MIND TO DEVELOP REVOLUTIONARY CONCEPTS RELATING TO DEEP OCEAN RESOURCES RECOVERY VIA SUBMARINE SYSTEMS. ONLY NON SMOKERS MAY APPLY. COMPANY STOCK AND PARTNERSHIP CONSIDERED. PLEASE SEND RESUME TO **WERNER OFFSHORE INC.**, FARMINGDALE, N.J. 07727.

MARINE ENGINEER

Reporting to Marine Operations Manager, maintains computer-based shipboard maintenance and repair management systems including maintaining engineering records and spare parts inventory, scheduling planned machinery overhauls, monitoring expenses, providing budget input. Assists in on-site shipyard supervision and preparation of shipyard specifications. May be required to periodically sail as relief engineer. Marine engineering degree and Assistant Engineer license desired (Chief's license preferred). Three to five years engineer experience at sea, in a shipyard or equivalent combination. Demonstrated knowledge of computer applications required. Send resume with names and addresses of at least three references to:

Personnel Manager
Box 54P

WOODS HOLE OCEANOGRAPHIC INSTITUTION 1930

WOODS HOLE OCEANOGRAPHIC INSTITUTION
Woods Hole, MA 02543
An equal opportunity employer M/F/H/V

SENIOR MARINE ENGINEER

Desirable Southern Atlantic Coast location. Must have BSME degree and minimum 10 years ship design experience, 6 years in Navy ship design. Shipyard background preferred. Experience in pump calculations, piping systems flow distribution, pressure drop, stress and flexibility analysis, and detailed construction drawing development and checking is required. Supervisory experience desirable. Competitive salary and benefits. Reply in confidence to

SENIOR MARINE ENGINEER
Box 1201, Maritime Reporter
118 E. 25th, New York, NY 10010
Equal Opportunity Employer M/F/H/V

MARITIME OPPORTUNITIES

AMERICAN TRANSPORT LINES
A Crowley Company

Has available "Career Path" placement opportunities in all seagoing positions. Candidates should have previous sea going experience and current license.

We are also accepting individuals with 1st or 2nd Class Radiotelegraph Operator License for placement in Observer Program leading to Radio Officer positions. Contact:

MR. LESTER WILLIAMS
Sr. Coordinator, Marine Personnel
P.O. Box 2110
Jacksonville, FL 32203
Or Call: 1/800-874-6769 (US)
1/800-340-8226 (FL)
Equal Opportunity Employer M/F

MASTER MARINER

US, BRITISH, LIBERIAN unlimited licensed, semi retired (aged 50) spotless record no accidents available for long or short term relieving jobs. Experienced in Bulk, Tanker, reefer. Telephone (205) 928 0628.

DEPUTY COMMISSIONER FOR TRANSIT OPERATIONS

The New York City Department of Transportation seeks top level manager for its Bureau of Transit Operations to:

- Oversee the operation and subsidies of nation's sixth largest bus fleet, managed by private New York City companies, and implement first city-wide paratransit service for the City's disabled.
- Operate and maintain the Staten Island Ferry, which transports 22 million passengers each year, with a ten year capital improvement program of $100 million.
- Develop plans for optimal private ferry services to ease Manhattan traffic congestion.
- Set public transit policy with city, state and federal agencies.

A Baccalaureate degree and at least five years of experience in transportation or a closely-related field with increasingly responsible managerial/executive experience required. Must possess excellent organizational, planning and communication skills. Transit management and/or maritime experience a plus.

Salary: mid $80's to low $90's, commensurate with experience; excellent benefits package.

Please send two copies of both your resume and cover letter stating salary history to: **Recruitment Office (DCBTO), New York City Department of Transportation, 40 Worth Street, Room 801, New York, NY 10013**

Successful candidates must become NYC residents within 90 days of appointment.

Equal Opportunity Employer

NEW YORK CITY DOT DEPARTMENT OF TRANSPORTATION

OPPORTUNITIES SHIPYARD ENGINEERING

Bender is in the process of expanding its engineering staff due to an increased work load and optimism in the marine market.

- **ELECTRICAL ENGINEER** Lead Position
- **MARINE ENGINEER** Senior & Junior Positions
- **NAVAL ARCHITECT** Senior & Junior Positions
- **LOFTING OPERATORS** Autokon
- **MARINE DESIGNER** All Disciplines
- **DRAFTERS** All Disciplines
- **PROJECT ENGINEERS** Marine Background

The diversification of our projects provides a wide range of experiences for junior positions and the variation senior people are seeking. Past and present projects include fishing vessels from shrimp boats to factory trawlers, OSVs, passenger vessels, and military availabilities.

Mobile's life style offers residential living at affordable prices, fine arts, shopping and southern hospitality. Our close proximity to the beautiful Gulf Coast puts fishing and swimming along with other outdoor activities at your finger tips.

For consideration to this opportunity, submit your resume in confidence.

Attention: Design Group Manager

BENDER SHIPBUILDING & REPAIR CO., INC.
P.O. Box 42, Mobile, AL 36601
EQUAL OPPORTUNITY EMPLOYER

DRY DOCKS or BARGES

For new construction, prefabrication, repairs, and conversions :
call for your special needs

CONRAD INDUSTRIES, INC.
504 384-3060, P.O. Box 790
Morgan City, LA 70381

FOR SALE
150 TON LINKBELT
CRAWLER CRANE
$140,000.
CONTACT (504) 879-2331.

For Barge Rentals or a Complete Marine Package

Call the Barge People.

Our experience and knowledge in serving a wide variety of industries enables us to provide the right size and type of barge and tow to make your marine operations profitable.

- Large, diversified fleet for inland, oceans and speciality service
- Experience in arranging and managing marine packages
- 20 convenient fleeting locations along Gulf Coast and upper river

Rentals–Sales–Service

New Orleans
(504) 949-7586
Telex 58-4393
Fax (504) 945-5513
2300 Surekote Rd
N.O. LA 70117

Houston
(713) 452-5887

Parkersburg
(304) 485-4494

St. Louis
(314) 469-0510

McDONOUGH MARINE SERVICE

FOR SALE—OPERATING STEEL FABRICATION YARD ON 4.5 ACRES LOCATED ON INTRACOASTAL WATERWAY W/UNLIMITED ACCESS TO G.O.M. ENGAGED IN FABRICATION OF STEEL STRUCTURES FOR THE OFFSHORE OIL INDUSTRY. YARD IS ALSO ENGAGED IN PERFORMING REPAIRS AND MODIFICATIONS TO TUGS, SUPPLY VESSELS AND BARGES. YARD IS BULKHEADED, MATTED AND FULLY EQUIPPED AND IS AVAILABLE FOR IMMEDIATE SALE OR LONG-TERM LEASE TO QUALIFIED PARTIES.

CONTACT (504) 879-2331.

DONATION WANTED

Respected, 501(c) (3) tax exempt organization conducting highly visible work with endangered whales, dolphins and sea turtles in New York Bight and Long Island Sound seeks 40-foot aluminum or fiberglass, diesel powered vessel suitable for research * Ideal opportunity for manufacturer promo, or tax advantage.**

**Contact: OKEANOS, POB 776,
Hampton Bays, NY 11946
(516) 728-4522 (days) 725-2870 (eve)**

INTERIM VESSEL IN SUPPORT OF U.S. ANTARCTIC PROGRAM (USAP)

ITT Antarctic Services, Inc., under contract to the National Science Foundation, Division of Polar Programs, is performing a market survey to determine the availability of an ice strengthened vessel in support of this program. The minimum basic requirements for the vessel are as follows:

Ice Class:	1A1—Ice Strengthened
LOA:	170 feet
Speed:	12 kts. but also able to hold course and speed for towing operations at 0.5 kts.
Range:	50 days in open water as 12 kts.
Fuel:	Vessel must use diesel for its propulsion plant.
Accommodations:	20 scientific berths.
Cargo Capacity:	1500 cu. meters, enclosed space.
Navigation:	Transit satellite navigation
Oceanographic Equipment:	To support General Oceanography
Communications:	SSB, VHF, Marisat

Owner/operators are requested to provide estimated costs on the basis of Baltic Time Charter for a period of 120 days, the austral summer season, with delivery and redelivery of the vessel at Puntas Arenas, Chile.

Estimates are to be based on one charter period with possible options for one or more additional seasons in the Antarctic. Offerors are to provide pictures, specifications, etc. of the vessel being offered.

Offerors are advised that there is no immediate requirement for this vessel. However, it is possible that we will require such a vessel for the austral summer season of 1989-1990.

Responses to this notice are to be submitted to:

**Mr. Aldo Preli, ITT Antarctic Services, Inc.,
621 Industrial Avenue, Paramus, New Jersey 07652**

ICE BREAKING RESEARCH VESSEL IN SUPPORT OF U.S. ANTARCTIC PROGRAM (USAP)

ITT Antarctic Services, Inc., under contract to the National Science Foundation, Division of Polar Programs, is seeking the charter/purchase of an icebreaking research vessel to operate in the Antarctic and southern ocean waters in support of the U.S. Antarctic Program. The vessel must be a large, general purpose multi-disciplinary oceanographic research vessel, capable of steaming continuously at three knots or better through level ice with a thickness of three feet or more, and capable of ramming pressure ridge with a 6 ft. sail height. The vessel should be between 250 and 300 feet LOA, fully sound and seaworthy, capable of operating for extended periods of deployment, world-wide, not less than seventy-five days, with helicopter operations capabilities, semi-automated dynamic positioning, and have accommodations for thirty four (34) or more scientific and science support personnel in addition to the vessel crew. Vessel must carry an English speaking crew.

Prospective Offerors are advised of the following Buy American provisions legislated by the United States Government specifically for this procurement.

That no funds in this Act shall be used to acquire or lease a research vessel with ice-breaking capability built by a shipyard located in a foreign country if such a vessel of United States origin can be obtained at a cost no more than 50 per centum above that of the least expensive technically acceptable foreign vessel bid. Provided further, that, in determining the cost of such a vessel, such cost be increased by the amount of any subsidies or financing provided by a foreign government (or instrumentality thereof) to such vessel's construction.

A formal RFP covering this charter/purchase is tentatively scheduled for late December 1988.

Letters of interest are sought concerning this announcement and are to be directed to the attention of:

Mr. Aldo Preli
**ITT Antarctic Services, Inc.
621 Industrial Avenue
Paramus, New Jersey 07652
Telex: 134458 FEDELCO PARA**

TANK BARGE FOR SALE

230.1x43.1x16.25

20,000 BBLS. 2 pumps. 2 systems.

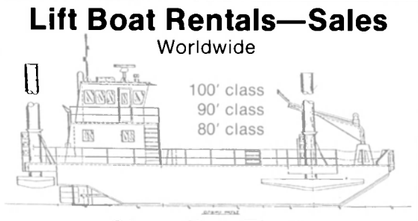
Located: New York Harbor.

PRICE: $450,000.

CALL: Elizabeth Gay, 212/269-3200.

Lift Boat Rentals—Sales

Worldwide



Shoreline Fleet

713-452-7910 Houston

FOR SALE

Fish processing vessel, OFF: #546488, built 1973, length 162.09 ft., breadth 38.01 ft., depth 12.06 ft. U.S. Flag.

2 CAT 398D: 2 CAT gears 7251: 3 generators 99 KW driven by CAT 3308 engines.

Sleeping 15. Net 117 tons. Gross 127 tons. Central air & heat. Full kitchen. Large bathrooms. Luxurious captain's quarters. Equipped with most modern electronics. Storage freezer capacity: 200,000 lbs. Ice maker capacity 5 tons 24 hours. Process room dimensions: 37 ft. x 110 ft. x 7.09 ft. Brine tank dimensions & capacity: 28 ft. x 5 ft. x 3 ft. 700 lbs per hour. 2 fiber-glass pick-up boats, 27 ft. long, powered by new Detroit Diesel engines. (6-71) 1 Scott Midland hydraulic crane 7.2 tons.

This vessel was completely re-fitted (1988) and can be used as a crab catcher/processor.

For further details call: Telephone: (504)-368-4038. TELEX: 161708 NLN UT FAX: 504-885-9642

FOR SALE

60 Ton Clyde Model 28-DE-11 Floating Crane with 115" Magnet. Boom Length: 110' Barge Dimensions; 111' x 63' x 12'-1"

Contact:
Jay Zimmern or
Robert Kelman
Prolerized Schiabo Neu
(201) 333-3131

PSN

SERVICE • REPAIR • PARTS CONSULTING • DESIGN

CUNNINGHAM MARINE HYDRAULICS CO., INC.

201 Harrison St. • Hoboken, N.J. 07030
(201) 792-0500 (212) 267-0328
FAX # (201) 792-7716

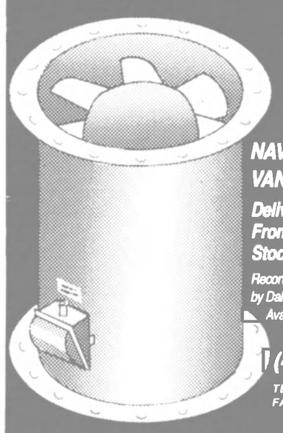
JACKSONVILLE, Florida 32202
(201) 792-0500
TWX 710-730-5224 CMH Hoboken, NJ

FUEL OIL TRANSFER PUMPS

2 ea. identical. Complete. Operating when taken out. DeLaval Turbine Pump Mfg., Model 323AVX337, with GE 60 HP 60-motor. Pumps 250 or 500 gpm. Like new. New price $24,000. Will sell for $7,495. Consumer Fuels, 205-837-5660.

JON M. LISS ASSOCIATES, INC.

411 BOREL AVENUE, SUITE 505 • SAN MATEO, CALIFORNIA 94402



NAVY STANDARD VANEAXIAL FANS

Delivery From Stock

Reconditioning and Rewinding by Dahl Beck Electric. Available with Warranty.

(415) 573-9191

*TELEX 17-2655 GOJON SMT
FAX (415) 572-8458*

Trilling Medical's 'Water-Jel': Unique Product For Emergency Burn Care And Fire Protection

Water-Jel® from Trilling Medical Technologies, Inc., Ridgefield Park, N.J., is described as a unique multi-use product for emergency burn care and fire protection, designed to help save lives and maximize the relief of pain and suffering caused by burns.

According to a spokesman for the company, "With this product, you just open the patented Water-Jel packet or container and apply the gel-soaked special carrier to the burn area. No special training is required."

According to the company, Water-Jel immediately lowers and stabilizes skin temperature, easing the pain and calming the patient. Because the product is bacteriostatic, the covered wound is protected from further contamination. Also, the product is water soluble, making it easy to remove burnt clothing without further damage to the wound.

Water-Jel comes in a variety of sizes that can easily be carried in all types of vehicles or stored in areas that are readily accessible to rescuers or burn victims. The company says the product is ideal for all potential fire or burn areas including industrial, emergency medical, government, military, and commercial.

For more information and free literature on Water-Jel from Trilling Medical Technologies,

Circle 87 on Reader Service Card

Halter Marine Christens Fourth Of Six Ocean Surveillance Ships In $85-Million Navy Contract

The U.S. Navy ship Capable was recently christened and launched at Halter Marine, Inc., Moss Point, Miss. She is the fourth of six identical ocean surveillance ships under construction at Halter for the Navy, with a total contract value of approximately $85 million.

The ship was christened by Mrs. **Patricia T. Lott**, wife of Representative **Trent Lott.** The principal was Rear Adm. **Richard F. Pittenger,** USN, Oceanographer of the Navy.

John Dane III, president of the Trinity Marine Group, the five shipbuilding companies which include Hater Marine, credited Representative **Lott** for helping to win Congressional approval and funding for the vessels and for helping Halter win the construction contracts for the six ships.

When commissioned the Capable will become the 16th of 18 planned monohull T-AGOS class ships to join the U.S. Navy's ocean surveillance program.

Operated by the Military Sealift Command (MSC) and staffed by civilian technicians, the Capable will tow electronic devices to monitor the movement of submarines.

The all-steel Capable is 224 feet long, with a 43-foot beam, and 15-foot 1-inch draft. Main propulsion and other ship's service is diesel-electric, provided by four Caterpillar/Kato 600-kw generators driving two General Electric motors. Power is transmitted through two shafts and full load displacement is approximately 2,300 long tons. Maximum speed is approximately 11 knots and normal operating speed is about three knots.

She will carry nine officers, 11 crew, and 10 technicians. In addition to the usual living spaces, the Capable also has a recreation room, exercise room, ship's store, and a self-service laundry.

Halter Marine, Inc., is part of the Trinity Marine Group owned by Trinity Industries of Dallas, Texas. The Group's corporate offices are being moved from New Orleans to Gulfport, Miss., in a phased transfer which began in November.

For free literature giving full details on the facilities and capabilities of Halter Marine,

Circle 71 on Reader Service Card

TBT-Free Antifouling Range From International Paint Gets Enthusiastic Response

International Paint (USA) recently launched its new TBT-free antifouling BRA 500 series, a coating that has been developed specifically to meet the requirements of the U.S. market. This was quickly followed by the introduction of International TBT-free copolymer antifouling BQA200 series throughout the rest of the world.

According to the manufacturer, the response to these new antifoulings by shipowners in the U.S. and Europe was immediate, and highly encouraging.

For example, in the USA, where legislation restricting the use of TBT-containing antifoulings is most severe, nearly 100 merchant vessels and over 60 naval ships have been coated with Interclene BRA 500.

This month marks the implementation of the USA Senate's "Organotin Antifouling Paint Control Act" (OAPCA). OAPCA provides that unless an antifouling is registered with the Environmental Protection Agency by December 15 and meets its regulations as regards the release rate of TBT in the coating, the manufacture, sales and distribution of that antifouling is prohibited in the USA.

International Paint's Interclene BRA 500 series offers shipowners excellent antifouling performance without the use of TBT and is registered with the EPA.

International Paint has always been a leader in marine coatings development and the recent success of its new TBT-free series is an example of the company's commitment to developing new products to help shipowners maintain the balance between performance costs and the ever-changing environmental pressures.

For further information and free literature on International Paint's TBT-free antifouling range,

Circle 69 on Reader Service Card