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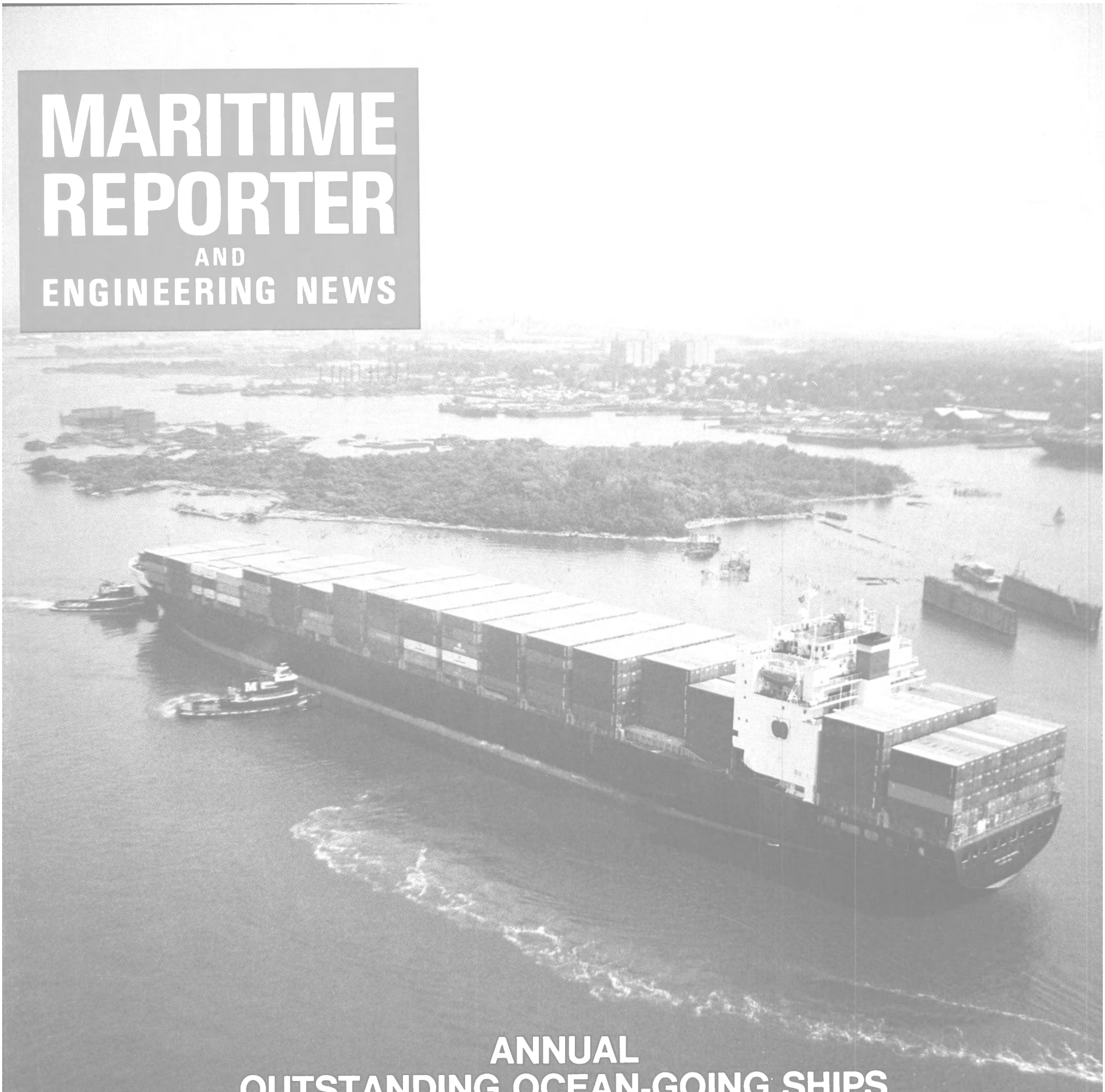

ANNUAL OUTSTANDING OCEAN-GOING SHIPS REVIEW

The American New York Leaves New York Harbor Assisted By Moran Tugs

Outstanding Ocean-Going Ships – A Review –

(SEE PAGE 4)

DECEMBER 1, 1984

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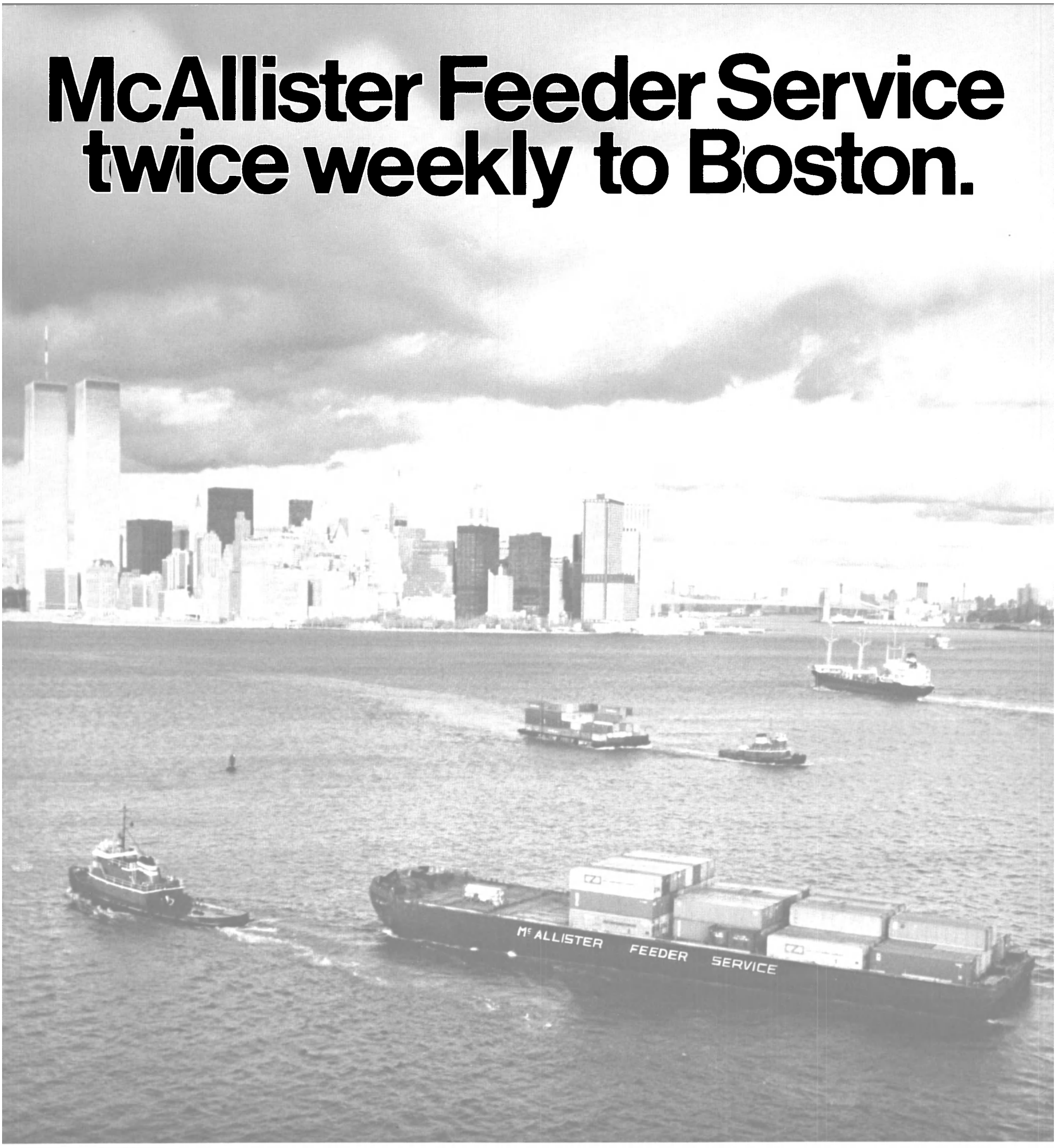

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ON THE COVER

The American New York is shown leaving New York Harbor after maiden voyage arrival in July. She is in the turning basin after backing out of Arthur Kill from her berth at Howland Hook Terminal in Staten Island. Photo—**Frank Duffy,** Moran Towing.

Annual Outstanding Oceangoing Ships Review
PAGE 12

Burrard Yarrows Wins Two P&P Contracts To Upgrade Cruise Ships

Burrard Yarrows Corporation, Canada's leading ship repairer, has been awarded a contract by P & O Cruises of Southhampton, England, to carry out upgrading work on their cruise vessels Island Princess and Pacific Princess.

The work, being carried out in conjunction with drydocking and repairs, comprises a new bar, pantry and food service on the sun deck, a new purser's office complex and entertainer's changing room, the refurbishment of the Princess boutique complex, dining room modifications and some sundry alterations.

Wallenius Lines Issues Letters Of Intent To Build Launch Barge

Wallenius Lines (Japan) Ltd., on behalf of their parent company, Rederi Ab Soya and its group of companies, has issued letters of intent to two major oil companies indicating their willingness to build and operate a new generation self-powered launch barge capable of transporting and launching jackets in excess of 60,000 metric tons. The vessel will be available to jacket fabrication and installation contractors and others on a nonexclusive basis. Barnett & Casbarian, Inc., Houston, engineering and marine consultants and marine surveyors, have been retained as design consultants.

Wallenius Launch Barge will have dimensions of 1,000 feet by 220 feet by 50 feet and sufficient power to provide propulsion assistance while under the command and tow of a single tug. Negotiations are presently under way with several yards for fabrication. Texas Seatrade Corporation, Houston, represents Wallenius Lines (Japan) Ltd. in the U.S. for the launch barge.

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No. 23 Volume 46

ALL MATERIAL FOR EDITORIAL CONSIDERATION SHOULD BE ADDRESSED TO ROBERT WARE, EDITOR.

Wilson Appointed VP, Sales & Marketing For MWM In North America

Carl D. Wilson

Carl D. Wilson has been appointed vice president, sales and marketing for MWM in North America. Mr. **Wilson** comes to MWM from the Terex Corporation of Hudson, Ohio, where he served as director of marketing. Prior to Terex, he held positions in the domestic and international marketing organization of the Clark Equipment Company, a major material handling manufacturer, headquartered in Battlecreek, Mich.

MWM-Murphy is based in Milwaukee, Wisc., and is the U.S. subsidiary of Motoren-Werke Mannheim (MWM) of Mannheim, West Germany. MWM is a worldwide engine supplier with manufacturing facilities in Munich and Mannheim; Zafra, Spain; Sao Paulo, Brazil and Milwaukee, Wisc.

Midland Affliated Co. Agrees In Principle To Acquire Federal Barge

Eastern Gas and Fuel Associates and Houston Natural Gas Corporation announced recently that Eastern's wholly owned marine subsidiary, Midland Affiliated Company, has agreed in principle to acquire Federal Barge Lines Inc., a wholly owned subsidiary of Houston Natural.

A formal agreement is expected to be completed by December and will be subject to approval by the boards of both Eastern and Houston Natural. The purchase price was not disclosed.

Midland, headquartered in Cincinnati, operates on the inland waterways carrying commodities, principally coal, on the Ohio, Illinois and Mississippi Rivers as well as the Gulf of Mexico. Total tonnage carried in 1984 should exceed 35 million tons. Federal, headquartered in St. Louis, operates mainly on the Mississippi River, with grain and coal comprising the bulk of an estimated six million tons carried in 1984.

Boston-based Eastern Gas and Fuel Associates is the parent organization of several energy-related companies engaged in coal production, natural gas distribution, inland marine transportation and oil and gas development. For the nine months ended September 30, 1984, Eastern's revenues totaled $1.0 billion and net income was $51.5 million.

HNG owns the largest intrastate pipeline in the country with about 5,300 miles of pipeline crisscrossing Texas and is actively engaged in oil and gas exploration, development and production. For the year ended July 31, 1984, revenues from continuing operations totaled $2.1 billion and net income was $122.1 million.

Keppel Marine Named Exclusive Agent For Continental Maritime

Keppel Marine Agencies, Inc., with offices in New York and Houston, was recently appointed as exclusive North American representative for Continental Maritime of San Francisco, Inc. of San Francisco.

Continental Maritime, formerly the SFW Corporation repair facility, recently placed an order with M.A.N. GHH Sterkrade in Oberhausen, West Germany, for construction of a new 25,000-ton lifting capacity floating drydock that is scheduled for delivery in May 1985. In addition to the new floating dock, Continental has also expanded its repair capabilities with the addition of more than 550,000 square feet of piers and shops.

For more information on this facility,

Circle 29 on Reader Service Card

Aerial view of HMRI facility near Hyundai's shipyard and engine factory in Ulsan overlooking Korea's East Sea. Long extension at left houses 690-foot-long towing tank.

Official opening ceremony for Hyundai Maritime Research Institute was attended by many government and industry officials and ship research scientists.

Hyundai's $18-Million Maritime Research Institute In Ulsan Completed

A gala opening ceremony was held recently to mark the official opening of the new Hyundai Maritime Research Institute (HMRI) in Ulsan, Korea. The event was attended by a large group of government and industry leaders from Korea and elsewhere, including many research scientists from model basins in Europe.

Located adjacent to Hyundai Heavy Industries' huge shipbuilding and diesel engine manufacturing complex, the Institute's facilities cover an area of almost 12,000 square meters and include a three-story main office building, a towing tank approximately 690 feet long, 46 feet wide, and 20 feet deep; a cavitation tunnel, a circulating water channel, and a ship model workshop.

Construction of the HMRI required some 32,000 man-days and cost a total of about $18 million, including $11 million for purchased equipment such as tank facilities, measuring devices, and machine tools. The Institute's current staff comprises 70 researchers, 15 of them with PhD degrees, and 30 employees for administration and operation of equipment.

Hyundai pioneered in the development of modern shipbuilding in Korea when it commenced activities in 1972. During the past 12 years the yard has achieved remarkable growth by successful delivery of some 300 vessels. In 1983 HHI delivered 34 vessels of various types totaling about 1,650,000 dwt, and during 1984 43 vessels of 1,900,000 dwt are to be delivered.

In his address at the opening ceremony, HHI president **Mong Joon Chung** said, "We have now become one of the largest shipyards in the world, offering shipowners excellent quality and technology. Since the establishment of the Hyundai Shipyard in Ulsan, the world shipping market has become more diversified and competition has intensified. Shipbuilders throughout the world have made great efforts to develop more economic and more efficient ship designs.

"Against this background, R&D activities have become essential to keep abreast with development of technology and also to maintain competitiveness in the world market. Thus at Hyundai Heavy Industries, the decision was made to establish our own research institute," Mr. **Chung** added.

"From now on, our R&D work will focus on the development of more economical designs for commercial vessels and offshore structures by utilizing the most sophisticated design technology. In this way, we hope that we can contribute to the prosperity of the world's shipbuilding and shipping industries," he concluded.

Circle 39 on Reader Service Card

$1.8 million-Contract to Awarded Penn Ship For Work On Breakbulk Cargo Ship

Pennsylvania Shipbuilding Company announced recently that the Military Sealift Command has awarded it a contract for the special survey, voyage repairs, drydocking and miscellaneous modifications to the USNS Southern Cross (T-AK 285).

The contract is valued at $1,850,000 and calls for completion of the work by February 13, 1985.

The Southern Cross is a breakbulk cargo ship which, until now, has been a part of M.S.C.'s Pacific Fleet: following the work to be done by Penn Ship, she will be reassigned to the Mediterranean. The Southern Cross was built at Penn Ship's Chester shipyard in 1962 as the Mormactrade, one of a class of ships delivered at Moore-McCormack Lines.

Pennsylvania Shipbuilding is also working on the conversion of the USNS Denebola (T-AKR 289) and the overhaul of the USS Patterson (FF-1061).

$425-Million Rig Expansion Program Announced By Sonat

Sonat Inc. announced recently that its subsidiary, Sonat Offshore Drilling Inc., has entered into an agreement with the Daewoo Corporation and Daewoo Shipbuilding & Heavy Machinery, Ltd. of Korea to build six semisubmersible drilling rigs for approximately $425 million. Following an initial delivery in the latter part of 1986, two of the six rigs are scheduled for delivery in 1987, and the remaining three will be delivered in subsequent years.

This order is the largest ever made by Sonat Offshore Drilling Inc. and thought to be the largest single commitment ever made in the offshore contract drilling industry. The parties were assisted by Fearnleys Group of Norway in developing this agreement.

The rigs, which will be built with design assistance from Gotaverken Arendal AB (GVA), will be constructed to drill in water depths up to 3,000 feet.

"This is a major program to respond to anticipated market requirements," said **Ronald L. Kuehn Jr.,** Sonat president and CEO. "These drilling rigs will offer far-reaching operating capabilities and the latest technology for deepwater drilling. We believe strongly that companies involved in the upper end of the offshore drilling industry with equipment capable of drilling in deep water and in harsh environments will be best positioned for future growth, and we are clearly aiming at that segment of the industry."

Sonat Offshore Drilling Inc., headquartered in Houston is one of the largest independent international offshore drilling contractors with a fleet of 21 marine units.

Sonat Inc., headquartered in Birmingham, Ala., is a company engaged in finding and producing oil and natural gas, field services associated with oil and gas operations, and transportation of energy products.

Krupp MaK Reports On Sales Of M551/M552 Series Diesel Engines —Literature Available

To date some 600 units of the Krupp MaK successful M551/M552 series diesel engines have been manufactured at the factory in Kiel, and another 35 engines have been produced by the licensee UBE Industries in Japan, with a total output of 3 million bhp. These engines have a bore of 450 mm and strokes of 550 mm (M551) and 520 (M552), with engine speeds of 425 and 500 rpm, respectively.

The M551 is available in 6- and 8-cylinder configurations; the M552 is manufactured with 6, 8, 9, and 12 cylinders. Output is 780/835 bhp per cylinder. These engines are capable of burning fuels of up to 7,000 sec Redwood I at 100 F. Specific fuel consumption for today's economy version of the 8-cylinder engine is said to be 130 grams per brake horsepower hour (0.286 pounds per bhp).

Two of this year's Outstanding Oceangoing Ships described in this issue, the LPG carriers Ledagas and Sultan Mahmud Badaruddin II, are powered by these MaK engines.

For further information and free literature on the M551/M552 series,

Circle 38 on Reader Service Card

Keppel To Represent Conastil Shipyard In N.A. —Free Brochure Available

Conastil Shipyard in Cartagena, Colombia, recently announced the appointment of Keppel Marine Agencies, Inc., with offices in New York and Houston, as its executive representative in North America.

The Cartagena yard, a full-service repair facility, is conveniently located on the Carribean side of the Panama Canal. Its new Syncrolift system can accommodate ships of up to about 10,000 dwt.

For more information including a descriptive brochure,

Circle 28 on Reader Service Card

Peterson Builders Lays Keel For Second Of Three Mine Countermeasure Ships

Keel-laying for MCM-3 Sentry, took place recently at Peterson Builders, Inc., Sturgeon Bay, Wisc. This ceremony marked the second keel-laying of the three mine countermeasure ships under contract with the Naval Sea Systems Command at PBI.

In addition to the MCM construction contracts, Peterson Builders holds the NavSea Lead Yard Services contract for the MCMs. As such, PBI works with the Navy in the design development of these ships, establishment of criteria for procurement, planning and scheduling, as well as compiling statisical data for the follow-on MCM construction contracts. A total of 14 MCMs represent the Navy's present requirements. This mine warfare renewal program will replace ships in service since the early 1950s.

Laying of the keel in PBI's newest and largest ship construction facility brings PBI's main ship building complex full to capacity with wooden ships. The 224-foot MCM-1 and MCM-3 as well as several 108-foot YPs of the seven ship Navy contract progress in various stages in these buildings.

Shown above at the keel-laying, left to right: **Curly Kostichka,** PBI MCM ship manager; **Ellsworth L. Peterson,** PBI president; **Richard Russell,** PBI production manager; Lt. **Richard J. Goldsworthy,** USN-Sturgeon Bay SupShip Project Officer; **Daniel McCluskey,** Sturgeon Bay SupShip MCM project manager; and **Niles Weborg,** PBI wood hull construction department head.

Eastern's new towboat Eagle is powered by two Detroit Diesel 12V-149N engines.

Eastern Marine Delivers Towboat —Ninth of A 10-Vessel Contract

Eastern Marine, Inc. of Panama City, Fla., recently delivered the towboat Eagle, the ninth vessel of a 10-vessel contract that was signed with Central Gulf Lines, Inc. of New Orleans, La. The vessels are operated by Compass Marine Gulf, Inc., also of New Orleans, and have a scheduled run between New Orleans and Port St. Joe, Fla., pushing a tow consisting of two barges loaded with 6,000 tons of coal.

The towboat measures 70 by 26 by 9 feet and is powered by two Detroit Diesel 12V-149N engines. The reduction gears are Twin Disc MG-540 at a 6:1 ratio. Kahlenberg 72/53 four-bladed stainless-steel propellers are mounted on 7-inch forged steel shafts. Shipboard power is provided by two 50-kw generators driven by two Detroit Diesel 4-71N engines.

Other equipment includes Fernstrum grid coolers, EMI 16-point alarm system, Kobelt engine controls, Patterson M51-5-100 deck winches, Carlisle & Finch searchlights, Perko Navigation lights, and Eacco doors.

Eastern Marine is a growing company that has earned a reputation in recent years as a builder of high quality vessels with exceptionally good workmanship. The company opened their Panama City shipyard in 1978. This 13-acre facility has over 1,300 feet of water frontage and is used primarily to construct medium to small sized boats. Fifteen miles east of the Panama City Yard, the company opened another shipyard in Allanton, in 1981. This facility is substantially larger and is used to construct larger vessels. It com-

(continued on page 9)

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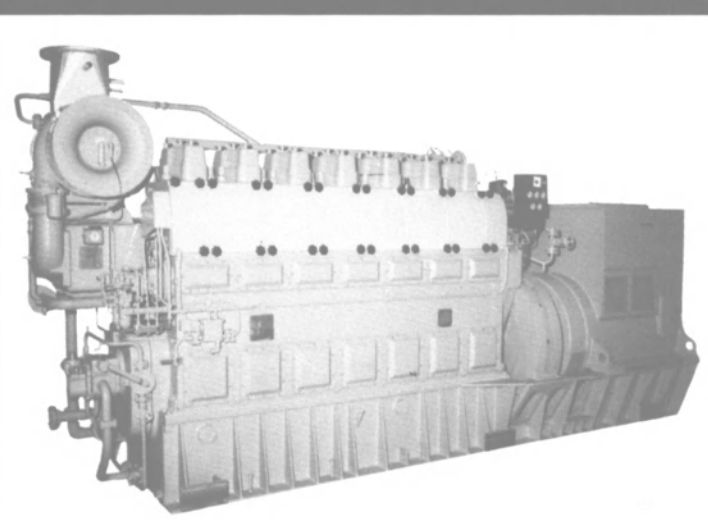

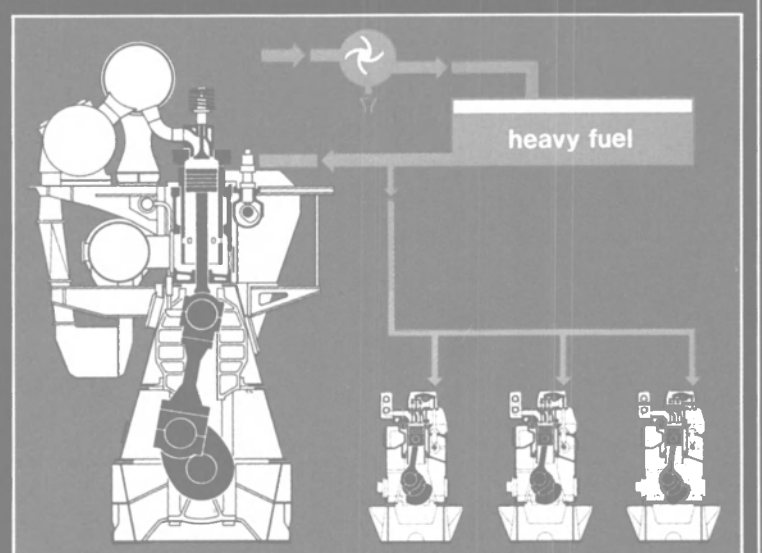

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Eastern Marine Delivers Towboat, Eagle

(continued from page 8)
prises 135 acres with more than 5,200 feet of water frontage.

In late 1983, Eastern Marine acquired a 10-acre ship repair facility in Panama City. Equipped with two marine railways, the yard is used for defense and commercial repair and haulouts. The new repair yard is part of Eastern Marine's effort to diversify their capabilities in the shipbuilding and ship repair industry.

For complete free literature on Eastern Marine's facilities and capabilities,

Circle 31 on Reader Service Card

New Industrial Mixer Seals By EG & G Sealol

Responding to demands for high reliability mixing seals in aggressive high pressure environments, the Engineered Products Division of EG & G Sealol has developed a seal system with demonstrated service times of 12 to 18 months mean time between maintenance (MTBM). The system is capable of handling in excess of 2,500 psi at various speeds. Seals are available in a variety of materials and face configurations. In addition, a new generation seal is under development which will extend the MBTM to 18 to 24 months and incorporate an optional detection system which will warn of malfunctions within the seal system.

The current seal is working in an application where catastrophic seal failure costs are in excess of $500,000 in product and downtime. In long term use, this seal system has not catastrophically failed or caused excessive product loss due to design or manufacture related problems.

For details on performance and other information,

Circle 17 on Reader Service Card

Western Gear Appoints Hugh B. Chare President

Norris K. Eskstrom, chairman, Bucyrus-Erie Company announced the appointment of **Hugh B. Chare** as president of Western Gear Corporation. Mr. **Chare** joined Bucyrus-Erie Company in 1975, where he held various positions in mining machinery sales and engineering and served as director of corporate development before transferring to Western Gear in 1982 as manufacturing manager, power transmission division. He subsequently served in the Western Gear Executive Office as manager of special projects and most recently as vice president, business development. In his new position, Mr. **Chare** will report to Mr. **Ekstrom,** chairman of the board and chief executive officer, Bucyrus-Erie Company and chairman of the board, Western Gear Corporation.

Mr. **Chare** replaces **John T. Edelman** who is appointed vice chairman, Western Gear Corporation.

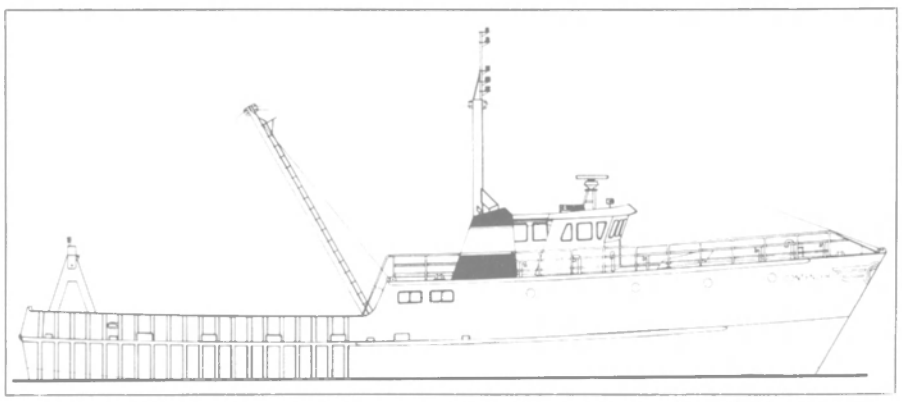
$2.8-Million Contract To Tacoma Boat Has $97.5-Million Potential

Tacoma Boatbuilding Co. announced recently that an initial down payment has been received on a contract with All American Fisheries, Inc., a San Francisco-based fishing company, for the construction of a 5,000-gross-ton 367-foot-long Surimi fishing processing trawler.

The vessel, which has a contract value of $20,800,000 is scheduled for delivery in June of 1986. This contract includes the cost of installing a significant quantity of contractor furnished processing equipment for the Surimi product.

In addition, the contract with All American Fisheries, Inc. contains options for four additional vessels to be delivered over the next five years and the total contract, including options is worth $97,460,000 to the Tacoma-based shipbuilder.

The vessels, which are the first of this type to be built in the U.S., will be homeported to Seattle, Wash. and will operate in the Bering Sea.



Line drawing of the 107-foot Contender, which will be berthed in New Bedford, Mass.

Desco Marine Chosen To Build 107-Foot Steel Fishing Boat

Tom Collins, president of Desco Marine, Inc. of St. Augustine, Fla., recently announced that the yard has been chosen by **Malvin Kvilhaug** to build a 107-foot steel fish boat for his Michigan Fishing Corporation. The contract is for a combination scallop dredge and stern dragger to be named Contender.

The 107-foot-long by 26-foot beam Contender will be the largest steel fishing boat ever built in St. Augustine. She will have accommodations for 12 crew members plus a captain's stateroom. Main power will be an EMD 645C coupled to a Reintjes WAV 1830 3:1 reduction gear turning a Kaplan-type propeller with Kort nozzle. Fish hold capacity is 7,000 cubic feet. She will cruise at 12 knots with a range of 3,000 miles. The vessel will be homeported in New Bedford, Mass.

The Contender's transversely framed, steel hull was designed to ABS standards. Construction will be witnessed by an ABS Worldwide Technical Services inspector, and delivery is scheduled for early 1985.

Desco Marine is a modern shipbuilding and repair facility whose capabilities include steel boats up to 200 feet, fiberglass boats from 29 to 90 feet, and wood boats to 73 feet.

For more information regarding Desco Marine's products and services,

Circle 30 on Reader Service Card

Marine Consultants' Society Hears Paper On An Attorney's View

The Society of Marine Consultants held its first luncheon open to the public recently at the Whitehall Club in New York City. The speaker was **Richard P. Hayden,** a partner in the well-known law firm of Hill, Rivkins, Carey, Loesburg, O'Brien, and Mulroy. The title of his talk was "The Role of the Marine Consultant—An Attorney's View."

The important elements of the talk were the need for professionalism among consultants, the certainty that each consultant is indeed expert in the areas of claimed competency, and that he could present this expertise clearly to the court in which he was testifying. Mr. **Hayden** also pointed out that records of individual testimony were now readily available to attorneys from computers, so that contradictory testimony in different cases could be fatal to the reputation of the consultant. He also touched briefly on the fee structures and the desirability of moderation therein.

Some 55 attendees at the meeting represented a wide spectrum of the marine world and provided a lively question-and-answer period at the conclusion of the presentation.

Mr. **Hayden's** views coincide with the purpose of The Society of Marine Consultants, which is to foster and advance the professionalism and integrity of its members, and to provide to the maritime industry a reliable source of professionally qualified consultants in all areas of marine expertise.

In view of the success of this first luncheon meeting, the Society is now tentatively planning a second, again with a recognized and knowledgeable speaker, for January 1985.

Principals at recent luncheon meeting of The Society of Marine Consultants included (L to R): **Alfred E. Stanford,** chairman of the Executive Committee; Capt. **James C. Musser,** executive director; and **Richard P. Hayden,** speaker.

Thoroughbred Topper built by Bay Shipbuilding (page 37).

OUTSTANDING OCEANGOING SHIPS OF 1984

A roundup of some of the most notable vessels delivered by shipyards throughout the world during 1984—selected for their outstanding design features, fuel efficiency, performance, and service characteristics.

AMERICAN NEW YORK
Daewoo Shipbuilding

The first four of 12 jumbo containerships being constructed for United States Lines, Inc., by Daewoo Shipbuilding and Heavy Machinery Ltd. were christened recently at the builder's Okpo Shipyard in South Korea. The first two of the ships were delivered to the owner in June, two months ahead of contract delivery date.

Designed by the New York naval architecture firm C.R. Cushing & Company, Inc., these vessels are by far the largest containerships ever built, with a capacity for 2,129 40-foot cargo containers (2,129 FEU/4,258 TEU)—1,232 FEU in the holds and 897 FEU on deck. Electric outlets are provided for 146 FEU of the deck cargo to be refrigerated containers. Several of the cargo holds are arranged for carriage of either 20-foot or 40-foot boxes

Named American New York, American New Jersey, American Maine, and American Alabama, they are single-screw, diesel-powered vessels with forecastle deck, bulbous blow, and engine room and accommodations located aft. Deadweight at scantling draft (38.2 feet) is 57,800 metric tons.

The first Panamax containerships (the largest ships that can transit the Panama Canal), the vessels have an overall length of about 950 feet, beam of 105.7 feet, and design draft of 35 feet. Roughly half again the size of the world's current largest containerships that require crews of 30 or more, the new USL vessels will operate with a crew of only 21, all berthed in single cabins.

Propulsion is provided by a single slow-speed, Hyundai/Sulzer 7RLB90 diesel engine with a maximum continuous rating of 28,000 bhp at 102 rpm, which gave the first ship a trial speed of more than 20 knots. Normal service speed will be 18 knots, provided by operating the engine at 85 percent of mcr (25,200 bhp at 98 rpm). Fuel oil consumption at this condition is estimated at 73.7 tons per day.

Electrical power is supplied by three sets of diesel generators, each of 1,000-kw output, and one 300-kw emergency diesel generator.

The design of the engine plant complies with the criteria for unattended machinery space—ACCU Notation of the American Bureau of Shipping classification. All necessary remote control, automation, and monitoring/alarm equipment is installed so that unattended ma-

(continued on page 14)

American New York

(continued from page 12)

chinery space operation can be maintained under normal seagoing conditions.

The fundamental design philosophy for the American New York Class ships was to obtain optimum fuel oil savings, easy maintenance, and high reliability. Some of the items considered necessary to achieve this philosophy were: adoption of the low-speed main diesel engine, installation of an economizer, adoption of gasketless type hatch covers, use of provisions containers in place of reefer rooms, and provision of a data logging system.

The $570-million, 12-ship order is said to be the largest commercial shipbuilding contract ever awarded, and represents the biggest single peacetime expansion for an American-flag shipping company.

Daewoo Shipbuilding is a member of the Daewoo Group, founded in 1967 and today one of Korea's largest business combines.

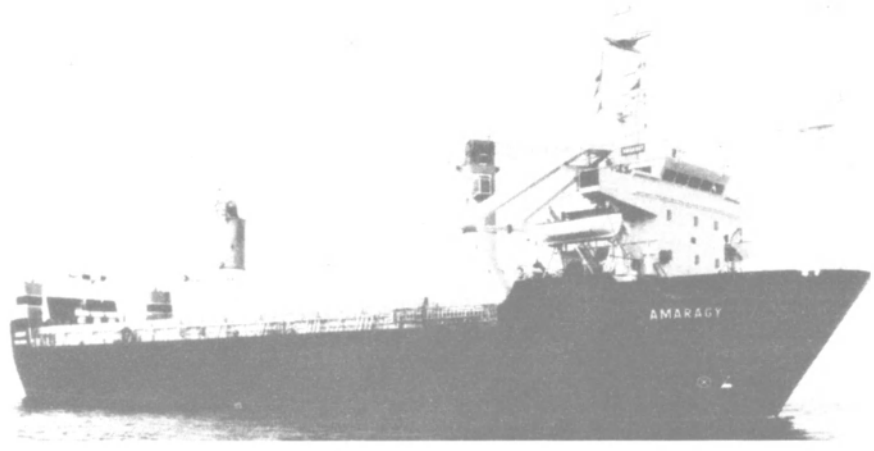
AMERICAN NEW YORK
Major Suppliers

Main engine	Hyundai/Sulzer
Propeller	Mitsubishi
Control consoles	Siemens
Alarm & monitoring system	Siemens
Steering gear	Tong Myung/Kawasaki
Steering control system	Sperry
Oil-fired boiler	Aalborg
Main air compressor	Teikoku
Fuel oil purifier	Nagase/Alfa-Laval
Main generators	Fuji
Main switchboard	Terasaki
SS diesel generator	Yanmar
Emergency diesel generator	Yanmar
Distilling plant	Nagase/Alfa-Laval
Sewage treatment system	Hamworthy
Incinerator	Volcano
Gyro plant with course recorder	Sperry
Satcom & satnav systems	JRC
Navigator unit	Racal-Decca
Latitude/longitude converter	Racal-Decca
Main radio system	ITT Mackay
Weather facsimile	JRC
Loran C receiver	Northstar
Radars & CAS II ARPA	Sperry
Container fittings	Peck & Hale
Cargo Hatch Covers	MacGregor
Side Ports	Hyundai MacGregor
Anchor & mooring winches	Fukushima
Lifeboats	Water Craft America
Coatings:	
Exterior hull above waterline	Ameron (Dimetcote)
Cargo Holds	Ameron (Dimetcote)
Ballast & other tanks	Ameron (Epoxy)
Shop primer (inorganic zinc)	Ameron
Underwater hull	International S.P.C. & Vinyl Tar
Cathodic Protection	N.C.E. Sam-Kong
Provisions crane	Daewoo
Provisions containers	Nissin
Air conditioning	Hi-Press VSG Carrier
Ceilings and panels	Isolamin
Level Indicators	Gems
Valves	Bonny Forge Centerline/Nakakita Fairbanks Farris Lichiyama Lunkenheimer Newco Nibco Velan
CO_2 system	Ginge Kerr
FO, DO, & LO separators	Alfa-Laval
Plate heat exchangers	Alfa-Laval

AMARAGY
Companhia Comercio

The first of a new flexible design of container RO/RO-LO/LO vessel, the 3,500-dwt Amaragy, has been delivered to her owners by Companhia Comercio e Navegacao (CCN), the leading Brazilian shipbuilder. The new vessel, the first RO/RO-LO/LO ship built in Brazil will be operated by Navemodal, which is owned jointly by the Brazillian shipping company Emprese de Navegacao Mercantil S.A., and Laurents

(continued on page 16)



Amaragy

(continued from page 14)

Lachmann S.A., a leading Brazilian shipping agent.

The ship, first of four that CCN has on order, will trade along the Brazilian Coast between Rio de Janeiro and El Salvador. The Amaragy can carry containers, containers on trailers, cellulose pulp in bags, and palletized cargo.

The Amaragy has an overall length of 308.53 feet, molded beam of 59.05 feet, depth to main deck of 16.07 feet, and summer draft of 14.93 feet.

The TEU capacity of the ship, above and below decks, is 260, and she can carry 53 trailers, 20.5 feet long and 9.5 feet wide in four lanes on the main deck. Total length of the lanes available is 1,128.6 feet.

The ship is equipped with a ramp at the stern and has two fixed cranes of 25 tons capacity and 6.89-foot outreach, both installed on the port side. She is fitted with a bow thruster controlled from the bridge that has a thrust of 3.5 tons.

Main propulsion engines are two 6-cylinder diesels coupled to two line shafts and two propellers through reverse/reduction gearing. The engines are MEP/M.A.N. model 6 ASL-25/30, each with maximum continuous rating of 1,800 bhp at 1,000 rpm. They are designed to burn medium fuel oil with a viscosity of 1,500 seconds Redwood 1 at 100 F. Three auxiliary diesel generators each produce 250 kva.

The speed of the vessel is approximately 12.4 knots. Fully air-conditioned accommodations for a crew of 22 are provided. Strengthened for carriage of heavy cargoes, the ship is classed by Lloyd's Register of Shipping +100 A1.

APOLLO ONE
Tacoma Boatbuilding

The Apollo One, first oceangoing hazardous waste incinerator ship designed and built in the U.S., was launched at the Tacoma Boatbuilding Company's Yard No. 3 in Tacoma, Wash., recently. The $37-million vessel and sister ship, the Apollo Two, are being constructed for At-Sea Incineration, Inc. (ASI) of Port Newark, N.J., a wholly owned subsidiary of Tacoma Boat.

Built with the aid of Federal Title XI loan guarantees, these ships have been designed to meet all existing environmental and safety standards of the U.S. Coast Guard, the Environmental Protection Agency, the Maritime Administration, and the National Bureau of Standards, among others, and are the first of their kind to meet the criteria of the American Bureau of Shipping.

The Apollo One can safely destroy up to 30 million gallons of hazardous waste each year. She is the first in a fleet of ships that ASI will operate at federally approved ocean burn sites. The currently approved site is in the Gulf of Mexico near Cameron, La.; the other, whose approval is expected shortly, is in the Atlantic Ocean. Both are 150-200 miles out at sea.

To support the burning of hazardous waste materials at sea, ASI will operate a multimillion-dollar marine transfer terminal near each of the burn sites. These commercial terminals will collect, test, blend, and temporarily store a variety of hazardous waste materials prior to transferring them to the incineration ships for disposal.

The launch of Apollo One culminates years of cooperative effort among international regulatory agencies, the Federal Government, and private industry to develop an environmentally acceptable alternative to the inadequate and often dangerous hazardous waste disposal methods of the past.

Classed by the American Bureau of Shipping as +Al E Chemical Carrier, +AMS, +ACCU, +IS, the Apollo One is designed with accommodations forward, chemical waste cargo tanks amidships, and propul-

sion and incineration machinery aft. A forcastle deck is provided forward and a poop deck aft.

Twelve integral cargo tanks are located to comply with requirements for a Type II cargo containment system. A pipe trunk is provided on center line throughout the length of the cargo space and from the inner bottom to the main deck. Transverse cofferdams are installed between cargo tanks. Ballast tanks are located outboard of the cargo tanks, in the double bottom space, and deep tanks forward and aft. Fuel oil tanks are provided aft and fresh water tanks forward.

The vessel has an overall length of 396 feet, molded beam of 60 feet, molded depth of 31 feet, and design full-load draft of 23 feet 6 inches. Deadweight at full-load draft is 7,317 tons. Liquid cargo capacity (100 percent full) is 197,730 cubic feet. Accommodations, berthing, messing, and lounges are provided forward for a total complement of 25 persons. The wheelhouse and radio rooms are also forward. A cargo pump room is located aft of the cargo space, with access to the main deck. Two Flume stabilization tanks are fitted above the cargo pump room.

Two liquid waste incinerators are installed on the poop deck aft of and above the propulsion and auxiliary machinery space. An incinerator forced-draft fan room is provided immediately below the incinerators. A central control room is located forward of the incinerator room for monitoring and controlling all cargo handling and waste incineration processes as well as centralized control of propulsion and auxiliary machinery.

Main propulsion is provided by twin Caterpillar D399T, 16-cylinder, 4-stroke diesel engines, each rated 1,125 bhp at 1,225 rpm. The engines drive Columbian Bronze fixed-pitched propellers through Caterpillar reverse/reduction gears. Engine controls (ACCU) were supplied by General Electric. A Bird-Johnson bow thruster is provided, powered by a GE 400-hp motor. Two auxiliary generators are also driven by Caterpillar D399T diesels.

APOLLO ONE
Major Suppliers

Main engines (2)	Caterpillar
Reduction gears (2)	Caterpillar
Propellers (2)	Columbian Bronze
Engine controls	General Electric
Shaft bearings & stuffing boxes	Johnson Rubber
Bow thruster	Bird-Johnson
Thruster motor	GE
SS generators	Caterpillar
Switchboards & transformers	GE
Steering system	Hough Marine
RPM indicators	Electric Tachometer
Motor controllers	Graybar
Air compressors	Rogers Machinery
Air receivers	Roy E. Hanson
Insert gas system	Process Systems
Tank washing system	Prosser East
Pumps	Argo Marine/Byron Jackson Cascade/Coen/Dean Bros. Kem Equipment/Power Pump
Flume design	McMullen
WT doors, hatches & scuttles	Freeman
Sliding WT doors	Walz & Krenzer
Anchors & chain	Washington C&S
Accommodation ladders	Rampmaster
Windlass & winches	Northern Line
Sewage treatment plant	Effluent Technology
Waste incineration system	Coen
CO_2 system	Wormold
Foam system	National Foam
Fire detection system	General Fire
Air conditioning	York
Refrigeration	Borg-Warner
Whistle	Kahlenberg
Searchlights	Apollo Marine
Navigation lights	Tacoma Marine
Nav. light panels	Henschel
Lifeboats	Atco Marine
Life rafts	Nordby Supply
Vent. fans	New York Blower
Batteries	ITT Mackay
Heaters & strainers	Familian NW
Valves	Coen/Familian/Liberty Equip. Seaport Controls/Waukesha Bearings
Radar & CAS	Raytheon
Loran C	Griffith Marine
Satcom system	Electro Nav
Satnav system & SSB	Sea Mar Electronics
VHF	ITT Mackay
Gyrocompass	Sperry Marine
Fathometer	Sea Mar Electronics
Coatings	Devoe
Facsimile	Griffith Marine
Cargo tank Press-Vac valves	Waukesha Bearings

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AQUA CITY
Nippon Kokan

Nippon Kokan K.K. (NKK) in Japan this year delivered the world's first oceangoing, sail-assisted motor vessel, the 30,900-dwt bulk carrier Aqua City, to her owner,

(continued on page 18)

Aqua City

(continued from page 17)

Aqua City Maritime Inc. of Liberia, for charter to Showa Line Ltd.

NKK has pioneered since 1978 in the design of sail-assisted ships in conjunction with the Japan Maritime Machinery Development Association. The shipyard built the first such vessel, Shin Aitoku Maru, in 1980; since that time, five smaller coastal and short-range vessels have been built and put into service in Japan.

The first sail-assisted vessel to fly a non-Japanese flag, the Bahamian-registered Aqua City is now operating in the Japan-Canada-U.S. West Coast trade. On her maiden voyage from Yokohama to Vancouver, B.C., she averaged 15.28 knots in sail-assisted operation and 14.86 knots using the engine alone at an output of 5,830 bhp.

The vessel has an overall length of 590.2 feet, beam of 83.3 feet, depth of 47.6 feet, and draft of 34 feet. Her Sumitomo/Sulzer 6RTA58 main diesel engine has an output of 8,300 bhp at 99 rpm. Design service speed is 14 knots. Total area of the two sails mounted atop her forecastle is 352 square meters.

The two sets of parabolic-shaped, rectangular sails on steel frames are 16 meters high and 11 meters wide. Computer-controlled, they respond automatically to shifts in wind direction and speed, and are said to provide up to a 30-percent fuel saving under the best wind conditions.

AQUA CITY
Major Suppliers

Main engine	Sumitomo/Sulzer
Turbocharger	IHI/BBC
Governor	Woodward
Propeller	Mitsubishi
Auxiliary boiler	Osaka/Aalborg
Generator sets (3)	Yanmar/Taiyo
Steering gear	Mitsubishi
Windlass, deck cranes (4)	Fukushima
Hatch covers	Kayaba
Lifeboats (2)	Ishihara
Accommodation ladder	Sanwa
Decca Navigator	Racal Decca
Gyrocompass & autopilot	Tokyo Keiki
Radio direction finder	Taiyo Musen
Inmarsat, radars (2), Loran C, radiotelephone, radiotelegraph	Japan Radio

ATLANTIC COMPANION
Kockums

The Atlantic Companion, first of five giant RO/RO-containerships scheduled to enter Atlantic Container Line's U.S. East Coast-U.K./Northern European service in 1984 arrived in New York on her maiden voyage recently, ushering in what ACL calls "a new era in North Atlantic shipping."

The 820-foot-long, 37,000-dwt Companion is the largest and most technologically advanced cargo ship ever built for the North Atlantic service, and like her sister ships to follow, was constructed to ACL design specifications. Designated as "G3s" by the company, they are the first new vessels built for ACL in 14 years, and will replace the fleet of five Second Generation steam-turbine-powered ships now in operation.

Designed by TransConsultants AB of Gotaverken and built in the Malmo, Sweden, shipyard of Kockums, the Atlantic Companion has a capacity for 2,130 TEUs as well as space for 600 automobiles in the stern superstructure. Among the major features of the vessels are a large, multi-lane quarter stern ramp; permanent cell guides on the weather deck so that up to 1,410 TEU of containers can be stacked easily and safety, four per tier; and three decks for normal, heavy RO/RO cargo or for the block stowage of containers. The cell guide structure, stern ramp, and other RO/RO equipment were supplied by MacGregor-Navire.

The consortium's vessels fly the British flag (Cunard), Swedish flag (Swedish American Line, Transat-

lantic Steamship, and Wallenius Line), Dutch flag (Intercontinental Transport), and French flag (Compagnie Generale Maritime). Of the four sister ships that will be delivered this year, Kockums is building an additional two, one is being constructed at Swan Hunter Shipbuilders at Wallsend, U.K., and Chantiers du Nord et de la Mediterranee at Dunkerque, France, is building one.

Main propulsion machinery in the Atlantic Companion consists of a six-cylinder, slow-speed Gotaverken/B&W 6L90GBE diesel engine developing a maximum continuous rating of 23,800 bhp at 97 rpm, direct-connected to a Stone Manganese Marine propeller. Electrical power is provided by four Wartsila/Vasa diesel engines, two 8R32 and two 6R32, directly connected to Norsk Elektrisk/Brown Boveri alternators of 2,310 kw and 1,722 kw, respectively.

Main and auxiliary engines are all capable of burning heavy fuel oil, providing a "single-fuel" installation. The ship is fitted with two KaMeWa thrusters, one forward and one aft.

Considerable effort was expended in achieving a functional and economic bridge layout. The totally enclosed wheelhouse is arranged with control desks forward but having a walkway directly behind the windows. The bridge wing consoles are

equipped for complete control of the main engine, bow and stern thrust-

(continued on page 20)

ATLANTIC COMPANION
Major suppliers

Main engine	Gotaverken/B&W
Propeller	Stone Managanese
Bow & stern thrusters	KaMeWa
Propeller shaft	Bjorneborgs
Shaft bearings	Waukesha/Lips
Shaft couplings	Gotaverken
Stern tube bearing	Rialco
Stern tube seals	Cedervall & Soner
Main engine silencer	Mercurex
Engine controls	Marinelco
Alternators	Norsk Elektrisk & Brown Boveri
Alternator engines	Wartsila/Vasa
Emerg. alternator	Scania/Stamford
Evaporator; FO, DO & LO purifiers, main LO coolers, FW coolers	Alfa-Laval
Air compressors	Atlas Copco/Hatlapa
Air receivers	Hansen & Christensson
Oil-fired boiler, exh. gas boiler, steam drum, FO heaters	Sunrod
Oil burner	Nu-Way
FO test kit	Perolin
FO service pumps	Gerbr. Steimel
FO viscosity control	Rossing & Jansson
Chem. cleaning tank system	Gamlen
Pumps	IMO/Scanpump/Comet Marine
Filters	Anderson & Grool/Boll & Kirch/ Maxi-Flow
Air conditioning	Nordisk Vent.
Vent systems	Svenska Flakt
Ejectors	Zander & Ingestrom
Bilge ejectors	Golar Metall
Anti-heeling system	Frank Mohn
Vac. sewage system	Electrolux
Sewage treatment plant, incinerator system	Hamworthy
Electric motors	Brown Boveri Svenska
Fire alarm system	Salen & Wicander
Mach. alarm system	SAAB Scania
Bridge alarm panel	Soren T. Lyngso
CO_2 extinguishing	Ginge
Halon extinguishing	Svenska Skum
Cargo control computer	Kockumation
Steering gear	Parsgrunn
Windlasses & winches	Norwinch
Anchors	Centromor
Anchor chain	Bulten Kanthal
Davits, accom. ladders	Welin
Lifeboats	Harding
Liferafts	RFD
Whistles	Kockumation
On-deck cell guides, stern ramp and door, ramp covers, bulkhead doors, hoistable car decks	MacGregor-Navire
Cranes	Lethab/Marine Transport Technology
FO/DO/LO separators, heat exchangers, Nirex Distillers	Alfa-Laval
Radars, ARPA, autopilot, gyrocompass, speed log, RAI	Sperry
Satnav/Loran C	Magnavox
Echo sounder	Honeywell-Elac
Radio station	ITT/Skanti
UHF radio, telephone and public address systems	L.M. Ericsson
Cathodic protection	Bergsoe
Coatings	International
Galley equipment	Electrolux

(continued from page 19)

ers, and rudder, and have data readouts on all maneuvering functions.

For maximum safety, sophisticated equipment installed includes an intergrated Sperry radar system with ARPA functions and position information connected on-line to the adaptive automatic pilot, and a satellite communications system making possible fast communications via telephone and telex and incorporating a high-speed data link for loading information.

Cargo control instrumentation, featuring a Kockumation Loadmaster computer, as well as the ship's safety instrumentation, is located in a separate control room on the starboard side of the superstructure, close to the lifeboats. The location of this control room gives easy access from cargo compartments and the accommodations area, as well as convenient escape routes in case of an emergency.

Without detracting from the importance of the other items of cargo access equipment installed in the G3s, there is no doubt that MacGregor-Navire's weather deck cellguide system, named StackCell™, is the most important advance made in container stowage since the cellular concept was first introduced in the mid-50s. Until now, the biggest drawbacks with fixed weather deck cell guides have been the high weight and the impossibility of utilizing them in conjunction with hatch covers. Therefore, all weather deck cell guide systems have until now been mounted marginally above RO/RO spaces and odd deck areas without access to underdeck holds.

Utilizing the MacGregor-Navire side-rolling, piggy-back hatch cover, made possible by incorporating a movable section of the cell guide in the area of the covers, cellular holds Nos. 1-5 can be loaded and discharged through the cell guides on the weather deck.

The twin hatches are fitted with two panels each, and open outboard. After the inner panel is raised hydraulically and the outer panel rolled beneath it, both are moved outboard in one unit to expose the holds and the cells below.

Another important feature of the StackCell system on the G3s is the versatility of being able to accommodate either 20-foot or 40-foot boxes simply by utilizing a movable insert frame that divides a bay into two 20-foot cells, or is positioned at one end of the bay, where its inner face becomes the end of a 40-foot cell. Flexibility is further improved by the frames being only three cells wide, giving four different 20/40-foot ratios each 12-row bay.

ATLANTIC UNIVERSAL
Mitsubishi

The Nagasaki yard of Mitsubishi Heavy Industries, Ltd., early this year delivered the 570,000-cubic-foot refrigerated cargo ship Atlantic Universal to Altantic Reefers Limited of Bermuda. Classed by the American Bureau of Shipping, the new vessel has an overall length of 492 feet, beam of 79.4 feet, depth to upper deck of 49.5 feet, and deadweight of 12,468 metric tons at a summer draft of about 32.2 feet.

In addition to the most up-to-date energy-conservation equipment, the vessel is provided with an effective refrigeration system for transporting a wide variety of frozen cargoes, along with facilities for

quick and efficient cargo handling. She is capable of carrying reefer cargo such as fruit, meat, dairy products, and concentrated juice, as well as containers. Her cargo holds are designed to permit temperature control within a range of +12.5 to −30 C.

The cargo space is partitioned into eight temperature-controlled groups, and further partitioned by 'tween decks into 17 ventilated compartments, each with a cooler room to provide even distribution of cold air.

The weather deck and 'tween decks in the refrigerated cargo holds are provided with MacGregor folding type steel hatch covers. Those on the weather deck are opened and closed by hydraulic cylinders, while those for the cargo holds are by means of wires manipulated by the ship's deck cranes.

The reefer plant has three Stal-built screw compressors (with economizers) using R-22 as primary coolant and brine as secondary coolant. It therefore has freon-brine heat exchangers (evaporators) integrated with condensers. These, with the compressors, are located on the tank top of the engine room. It is also provided with a brine pump room and brine headers.

An air cooler equipped with a fan for air circulation is fitted on each side of the cargo hold. The ventilation frequency of the hold can be selected from 90, 60, or 40 times per hour according to the kind of cargo being carried.

The main propulsion engine of the Atlantic Universal is the newly developed, fuel-conserving Mitsubishi/Sulzer 7RTA58 diesel having a maximum continuous rating of 13,440 bhp at 123 rpm. Normal rating is 12,100 bhp at 119 rpm, providing a full-load service speed of 20.1 knots.

The electric power plant is driven by four Daihatsu fuel-efficient diesels capable of running on fuel of up to 1,500 sec Redwood No. 1 at 38 C.

The ACCU notation of the American Bureau of Shipping is applied to the engine room. Not only can necessary control and monitoring be achieved from the engine control room, but unmanned operation is also possible through automatic operation and control of principal machinery and equipment in the engine room.

Other features include: fuel oil purifiers can be operated either in parallel or in series and can also be used as clarifiers; an oil bath type fresh water cooling system is used for the intermediate bearing; jackets and pistons are provided with plate type fresh water coolers; and the cooling sea water piping is made entirely of aluminum brass.

ATLANTIC UNIVERSAL
Major Suppliers

Main engine	Mitsubishi/Sulzer
Generator engines (4)	Daihatsu
Generators & motors	Mitsubishi Electric
Auxiliary boiler	Mitsubishi
Cargo reefer system	Stal (Alfa-Laval)
Deck cranes (5)	Mitsubishi
Steel hatch covers	MacGregor Far East

(continued on page 22)

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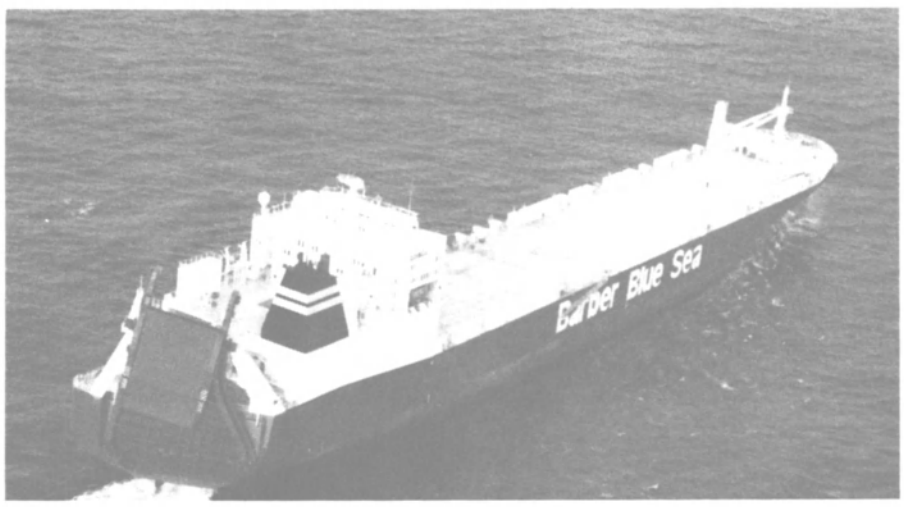


BARBER TAMPA
Hyundai Heavy Industries

Built at the huge Ulsan shipyard of Hyundai Heavy Industries Company, Ltd., in South Korea, the three largest RO/RO-containerships in the world entered the international service of Barber Blue Sea this year. Dubbed SuperCarriers II by their owner, the Barber Tampa, Barber Texas, and Barber Hector are 860 feet long and each has a cargo capacity of 2,464 TEUs of containers and 630 American-sized cars. The three ships represent an investment of some $200 million.

In order to produce an optimum hull form for the Barber Texas and her two sister ships, a series of model tank tests were conducted at various research centers. Towing and cavitation tests were repeated as many as nine times at the Norwegian Hydrodynamic Laboratory. In addition, Hyundai etc. retained the Swedish Maritime Research Center to conduct sea-keeping and maneuvering tests.

Considerable emphasis has been placed on the ship's safe operation. To improve damage stability, two watertight transverse bulkheads are partly fitted in the cargo space. Equal emphasis was put on maximum cargo loading capacity. Three fixed decks and two hoistable car decks are installed and the engine room's size is minimized, providing some 295,470 square feet of cargo deck area. Fixed ramps are fitted between decks.

For fast and easy cargo handling, and angled stern ramp 148 feet long with a minimum clear width of 41 feet is installed. Entrance height at the stern door is 50 feet. A side door with portable car ramp is also provided. At the forward end of the ship, a 40-ton electro-hydraulic cargo crane insures self-sustaining loading and unloading in that area.

Main propulsion is by a Hyundai/B&W 8L90GB diesel engine with maximum continuous rating of 36,600 bhp at 97 rpm, directly connected to a Kobe Steel propeller. Service speed of 19.5 knots at design draft of 32 feet is achieved at 85 percent of mcr (32,940 bhp at 94 rpm). KaMeWa 2,300-hp thrusters are fitted forward and aft to improve the vessel's maneuvering performance.

Electric power is provided by three diesel generators of 1,900 kw each, two diesel generators of 900 kw each, and a single turbogenerator of 1,000 kw. The unmanned machinery space can be controlled remotely by Terasaki equipment.

Built to Lloyd's Register of Shipping classification +100 A1, RO/RO Containership, +LMC, UMS, the Barber Tampa has a molded beam of 105.84 feet, molded depth of 68.90 feet, and scantling draft of 38.38 feet. At that draft the ship has a deadweight of approximately 44,000 metric tons.

BARBER TAMPA
Major Suppliers

Main engine	Hyundai/B&W
Turbocharger	IHI/Brown Boveri
Engine controls	Terasaki
Propeller	Kobe Steel
Bow & stern thrusters	KaMeWa
Auxiliary boiler	Osaka Boiler
Valves & actuators	Nakakita
Heeling system	Framo
CO_2 & Halon systems	Ginge
Ventilation fans	Flakt
RO/RO equipment	Hyundai/Kayaba/Navire
Deck crane	Hagglund
Elevator	Nippon Elevator
Radar & anti-collision systems	Atlas
Satnav & satcom	Magnavox
Radio direction finder	ITT
Echo sounder	Simrad
Gyrocompass	Sperry
Magnetic compass	Henry Brown
FO, DO, & LO separator	Alfa-Laval
Plate heat exchangers	Alfa-Laval

CENTURY HOPE
Mitsui

The 68,082-dwt bulk carrier Centruy Hope was delivered this year at the Tamano Works of Mitsui Engineering & Shipbuilding Company, Ltd., to the Kowin Shipping Company of Hong Kong.

The bulker has an overall length of 730.68 feet, molded beam of 105.64 feet, depth of 60 feet, and full-load draft of 43.5 feet. Main propulsion is by a Mitsui/B&W 6L67GBE slow-speed diesel engine with a maximum continuous rating of 13,000 bhp at 123 rpm. On sea trials the ship achieved a maximum speed of 16.32 knots.

Cargo space is divided into seven holds with a total capacity (grain) of 80,120 cubic meters. No. 4 hold can also be used as a ballast tank to secure sufficient draft in stormy conditions. Holds Nos. 2 and 6 can also be used as ballast tanks in port for draft adjustments

Hull weight reduction has been achieved with 32-kilogram (70.5-pound), high-tensile steel for the decks, bottom shell plating, double bottom, and upper and lower hopper sections, with the exception of some areas of the side shell plating. The bottom and waterline area of the hull are coated with self-polishing, long-life antifouling paint to reduce the frictional resistance and thereby conserve fuel.

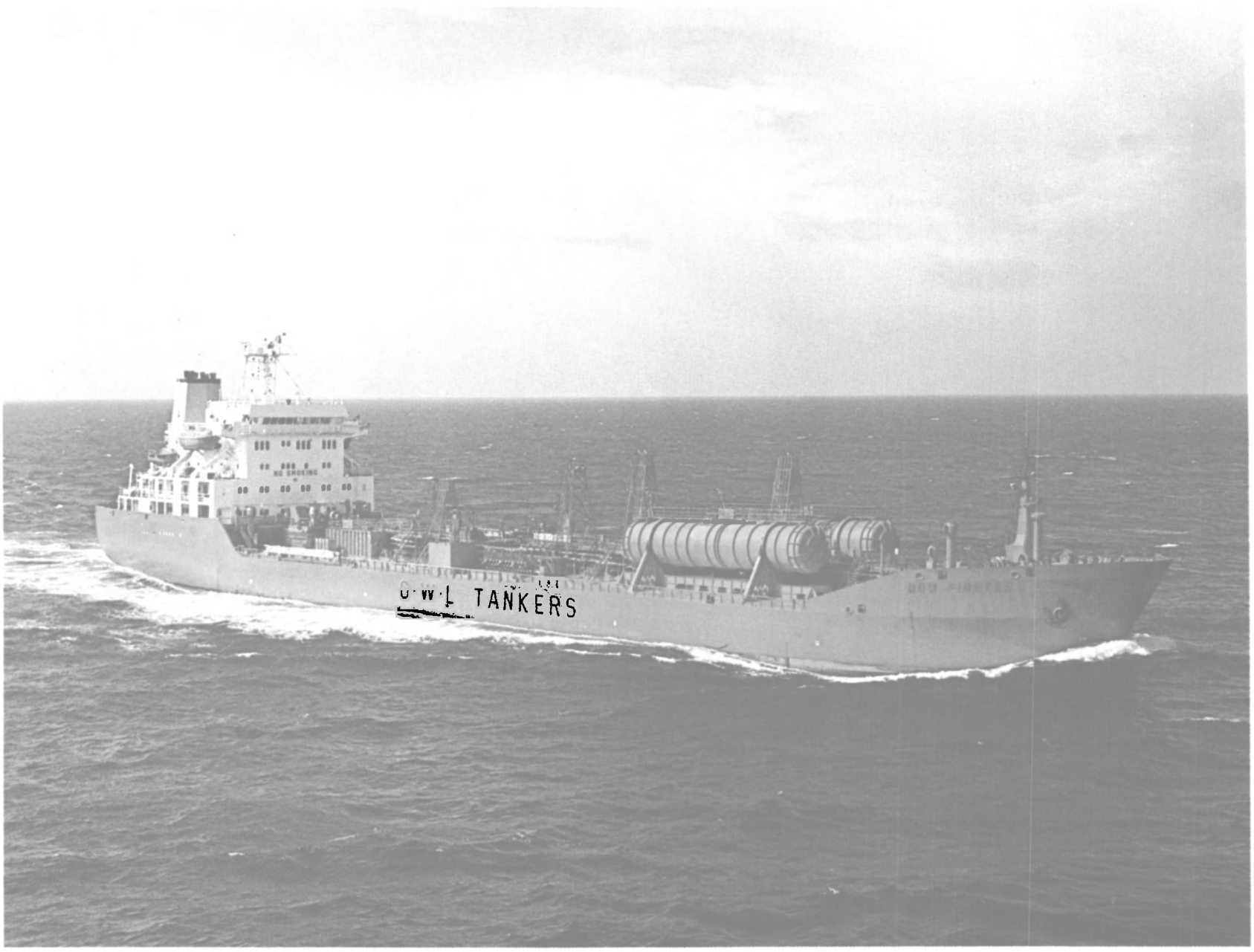
The propulsion plant features, besides the fuel-efficient Mitsui/B & W main engine, a Mitsui Integrated Duct Propeller. Remote maneuvering, control and monitoring systems qualify for the UMS (unmanned engine room) notation of Lloyd's Register of Shipping.

Navigation equipment includes a Loran C receiver and Decca Navigator.

EVER GATHER
China Shipbuilding

The containership Ever Gather, delivered to Evergreen Line this year by China Shipbuilding Corporation, is the first of six delivered during 1984 by the Taiwan shipyard

(continued on page 25)



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Ever Gather

(continued from page 22)

that are part of an eventual fleet of 24 sister ships of 2,728 TEU each that will provide a weekly around-the-world service in both directions starting in mid-1986. Known as the G-type full containerships, six have been delivered by Ishikawajima-Harima, and Onomichi Dockyard in Japan has delivered four. CSBC will deliver four more in 1985 and Onomichi will deliver an additional four in 1985-86, at which time the 24-ship G-Class fleet will be complete.

Evergreen has designed these high-efficiency G-type vessels with many innovative features. When fully utilizing cargo holds and deck space, with containers four tiers high on deck, each ship is capable of carrying 2,728 TEUs. At the same time, minimized wind resistance, and propulsion power from a 24,000-bhp Sulzer 6RBL90 main engine, allows them to maintain a service speed, with the engine operated at 21,600 bhp and 98 rpm, of 20.5 knots with a consumption of 68 tons a day for maximum fuel economy.

Every care was taken to provide the new ships with the most advanced and reliable navigation equipment, including satellite navigation, Decca receivers, Loran C, Doppler sonar and logger, and Japan Radio Company radars with automatic plotting aids (ARPA). In each system, microcomputers calculate the optimum sailing route and give continual video display of updated route information. Marine satellites continuously monitor sea and weather conditions, and guide the ship's autopilot.

The G-type vessels are also equipped with a JRC INMARSAT, an all-weather, high-technology global satellite communications system. Direct communications between ships and offices are available via telephone, telex, and telfax, allowing instantaneous transmission of messages, visual displays, and drawings.

To guarantee accurate and trouble-free sailing, the Sulzer diesel engine, which for the first six CSBC-built ships were manufactured by TMMC-IHI, is complemented with a variety of other advanced machinery. A fully automated engine room control system allows speed and direction to be controlled from the bridge, with unmanned operation of the engine room. Crews are thus reduced in size to 17 members, who are freed to undertake continual maintenance work, keeping the ship in ideal condition and running at optimum efficiency.

An anti-heeling system is installed to prevent listing while containers are being loaded and unloaded. Automatic constant-tension winches adjust moorings, and an automatic remote-controlled bunkering system allows thousands of tons of fuel oil to be taken on in a short time under the supervision of single crewman in the control room. This not only saves manpower, but also prevents potential pollution through leakage and spillage. This system was developed by Evergreen in collaboration with the Nakakita Manufacturing Company of Japan, and is in increasing demand by other shipowners under the brand name of Ever Kita.

All crewmen, from the captain to the messboy, are housed in private first-class accommodations with private bathrooms, all decorated in classical motifs. Leisure facilities include a library, gymnasium, and lounge with stereo system for the enjoyment of crew members not on duty. These amenities help to maximize crew efficiency.

EXXON BAYTOWN
Avondale Shipyards

The 57,000-dwt tanker Exxon Baytown was delivered this year by Avondale Shipyards, Inc. The crude oil carrier was built for Exxon Shipping Company of Houston, and will transport cargoes between U.S. West Coast and East Coast ports, and will also trade in the Caribbean area.

(continued on page 26)

Exxon Baytown

(continued from page 25)

Two similarly designed but smaller 42,000-dwt, multi-product petroleum and chemical carriers, the Exxon Charleston and Exxon Wilmington, were delivered to Exxon Shipping by Avondale. Each of these three ships represents an investment of $100 million.

The Exxon Baytown has an overall length of 779 feet 6 inches, beam of 105 feet 10 inches, and draft of 38 feet 5 inches. Main propulsion is provided by a 17,000-bhp Mitsubishi/Sulzer RL90 slow-speed diesel engine. The vessel is capable of carrying up to 459,312 barrels of crude oil in her 14 tanks, which are served by four main cargo pumps. Cargo piping is arranged to permit the carriage of two grades of crude oil simultaneously.

Avondale built the tanker utilizing state-of-the-art techniques for zone outfitting. Large structural modules were extensively outfitted with piping, ductwork, electrical wireways, and equipment prior to being erected at the building site. In addition, many machinery package units and pipe package units were assembled ashore and then lifted aboard.

The Exxon Baytown incorporates the latest safety and environmental protection standards, is heavily automated, has a bow thruster for docking control, and has the most modern satellite navigation and communications equipment available. Slow-speed diesel propulsion and a special hull coating to minimize water resistance are two of the energy-conserving features of the vessel's design.

Avondale Shipyards, located on the Mississippi a short distance upriver from New Orleans, is a wholly owned subsidiary of Ogden Corporation of New York.

EXXON BAYTOWN
Major Suppliers

Main engine	Mitsubishi/Sulzer
Generators	Reliance Electric
Generator engines	B&W Holeby
Emergency generator	Great Lakes Energy
IG generator	Holec Gas Generators
Cargo dehumidifiers	Cargocaire
Air conditioning	Carrier-Transicold
Anchor windlass	Lake Shore
Mooring winches	Lake Shore
Exhaust gas boiler	Green
Bow thruster	Bird-Johnson
Castings	Service Foundry
Compressors	Hamworthy
Distillers	Alfa-Laval
Control console	TANO
Ballast & cargo console	Megasystems
Joiner work	Hopeman
Cargo pumps	Worthington
Cargo pump motors	Reliance
Ballast pumps	Warren
Propeller & shifting	Avondale
Galley equipment	Alexander Industries
Steering gear	AEG-Telefunken
Radar	Sperry Marine
SatNav	Navidyne
FO, DO, & LO separator	Alfa-Laval
Plate heat exchangers	Alfa-Laval

HAPPY BUCCANEER
Hitachi Zosen

The 13,740-dwt Happy Buccaneer, said to be the most powerful heavy lift cargo carrier in the world, was delivered recently by the Hiroshima yard of Hitachi Zosen Corporation in Japan to Amstel Tanker Management B.V. (Mammoet Transport) of the Netherlands.

The vessel is fitted with two heavy lift mastcranes (HLM), a new development of Blohm + Voss of Hamburg, West Germany. Each crane has a lifting capacity of 550 tons, and operated in tandem they can lift loads of up to 1,100 tons at an outreach of 35 meters (about 115

feet). Unlike conventional cranes, the derrick of the HLM slews around a fixed mast. Because of this design, the mast diameter as well as the diameter of the slewing bearing can be relatively small, thereby reducing deck space required.

The HLMs' design and their arrangement at the starboard side of the ship make it possible to provide a continuous and very wide hatch opening for bulky heavy lifts. At sea the derricks will be lashed in a nearly vertical position, permitting the carriage of bulky deck cargoes.

Open hull construction has been adopted for this ship, and no longitudinal bulkheads are present in the cargo hold, thus allowing large-size cargoes of various shapes. The cargo hold is divided into two compartments, upper and lower, by pontoon type hatch covers. The hold is designed so that the vessel can sail while her upper-deck hatch covers are removed. In addition, heavyweight cargoes can be rolled on and off via the ship's stern ramp. As an alternate cargo, the vessel has a carrying capacity of up to 1,058 twenty-foot containers.

Main propulsion is provided by two Hitachi/Sulzer 6ZAL40 diesels, each with maximum continuous rating of 5,220 bhp at 580 rpm. Twin controllable-pitch propellers are driven through reduction gearing; a bow thruster is also installed. Together they provide the ship with efficient propulsion and enhanced maneuverability.

The Happy Buccaneer has an overall length of 439.6 feet, beam of 92.85 feet, depth of 48.56 feet, and full-load draft of 27 feet. She is built to Lloyd's Register of Shipping classification.

HUMBOLDT EXPRESS
Samsung Shipbuilding

The Koje Shipyard of Samsung Shipbuilding & Heavy Industries Company, Ltd. in Korea recently delivered two multi-purpose containerships to Hapag-Lloyd A.G. of Hamburg, the West German shipping company that operates worldwide services. Christened Humboldt Express and Cordillera Express, they each have a capacity of 1,938 TEUs in six cellular cargo holds and on deck. These sophisticated vessels were designed and built under the rules of Germanischer Lloyd and are classed + 100A4, E, MC, AUT, Multi-purpose Container Vessel.

These ships are diesel-propelled, single-screw cellular containerships of 34,000 dwt. A traveling gantry crane is installed on the main deck for self-loading/unloading of boxes and breakbulk cargoes, making them independent of shoreside cranes. With a con-airducting system installed, they can carry up to 262 TEUs of reefer containers in the hold, and up to 100 TEUs of integral reefer boxes as deck cargo.

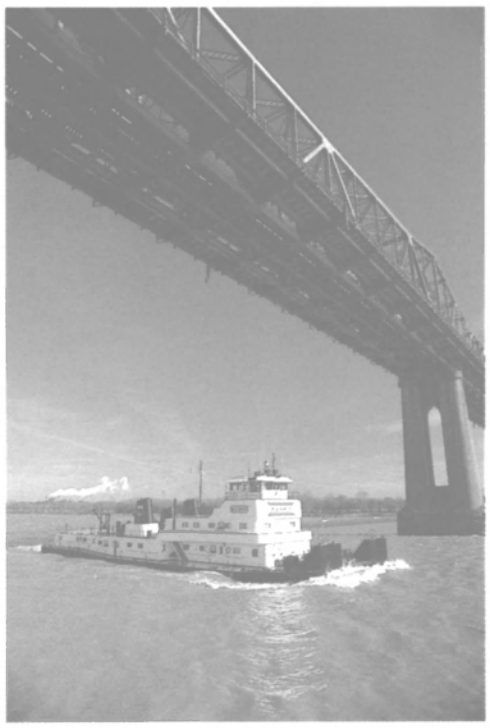
The ship has an overall length of 675.14 feet, beam of 105.64 feet, depth to main deck of 61.68 feet, and design draft of 30 feet. Accommodations are provided for a crew of 33, all in private cabins that were installed as prefabricated units.

Humboldt Express is propelled by a low-speed Hyundai/B&W 5L90GBE diesel engine with a maximum continuous rating of 19,800 bhp at 97 rpm, direct-connected to a five-bladed, highly skewed Ostermann propeller via Kobe Steel shafting. Operating at 85 percent of mcr, service speed on a draft of about 30 feet is 18.4 knots. Cruising range at the service speed is 20,000 nautical miles. The main propulsion engine is designed to burn heavy fuel oil at a rate of 46.5 metric tons per day.

The most unique feature of these new Hapag-Lloyd ships is the asymmetric afterbody hull form, newly developed by **Ernst A. Nonnecke** of Hamburg in cooperation with the Hamburg Ship Model Basin. Though it looks unconventional below the waterline, the new stern has already proven its advantage in cutting fuel costs by up to 10 percent.

The ships now being built with the asymmetric stern are all destined for German owners. In addition to the Hapag-Lloyd ships, nine vessels are being built in Brazil for three different German owners, all

(continued on page 30)

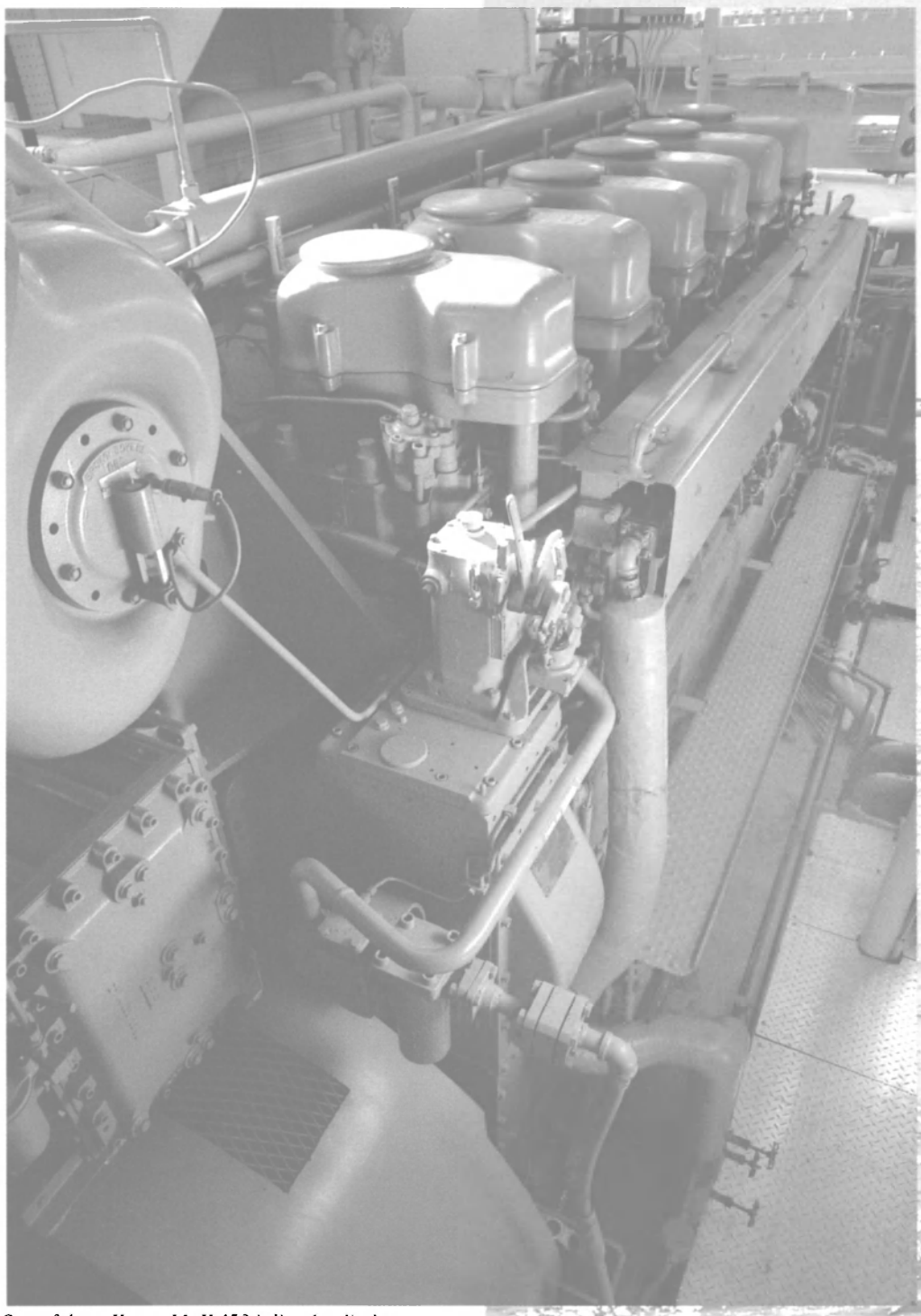


The Bill Elmer visited New Orleans for the 1984 Work-Boat Show.

"Repowering the M/V Bill Elmer with these Krupp heavy fuel engines didn't happen overnight," recalls Butch Barras of ACBL. "We studied this move for a long time; serious study for 2½ years, and dyno testing for close to a year before putting a heavy fuel engine in the boat.

"All through that, Gulf was a constant source of information and advice. Gulf helped determine power requirements and fuel mixtures, and provided a lot of information on the kind of lubricants we'd need to keep things running burning 1500 Redwood fuel with its high vanadium and carbon deposits."

With 1320 hours on the engines, the rings remain clean and free, and piston skirts show minimal scuffing.

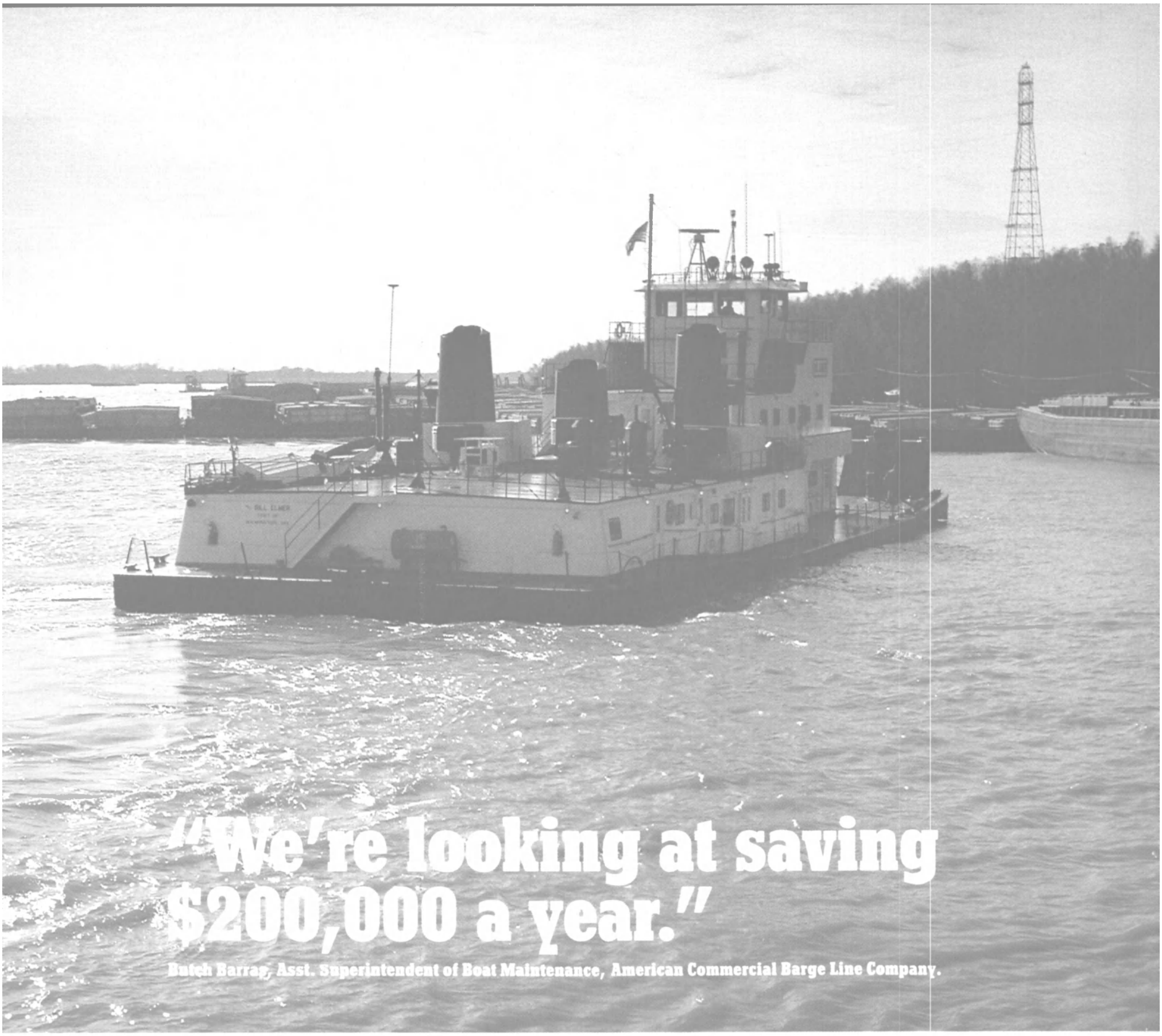


One of three Krupp MaK 453 inline 6 cylinder engines now powering the M/V Bill Elmer. ACBL repowered the vessel after studies showed the probability of significant fuel savings from heavy fuel engines.

Barras continues, "It's no exaggeration to say we wouldn't be where we are on this without Gulf. They work hard to help, and their Harmarville lab is an excellent research facility.

"Along with the advice and information, Gulf provides excellent lubricants. Gulftow Select 40 is our main engine oil, and look at these engine parts. We were planning to pull the heads and check all the valves at 2,500 hours. After looking at one cylinder here in New Orleans during the Work-Boat Show, with 1320 hours on the engines, we'll

Gulf representatives Warren Eise and Sam Ross with Butch Barras, ACBL Assistant Superintendent of Boat Maintenance, in the Bill Elmer pilot house.



"We're looking at saving $200,000 a year."

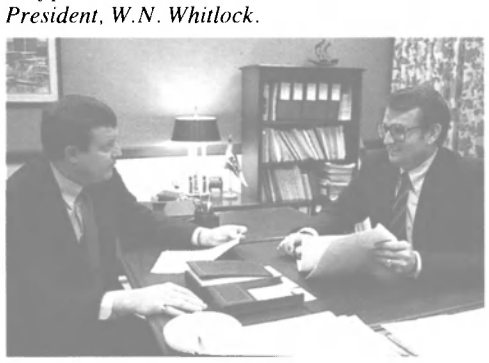
Butch Barrag, Asst. Superintendent of Boat Maintenance, American Commercial Barge Line Company.

probably wait until 4,000 hours before we even have to check for wear."

Butch concludes, "We're projecting a savings of about $200,000 a year in fuel cost alone due to repowering with the heavy fuel engines. Gulf helped make the transition a lot smoother."

For products to help save your machinery, and information to help you save money, ask your Gulf pro, or write, Gulf Oil Products Company P.O. Box 1563, Houston, Texas 77251.

Gulf pro R.O. Whelchel and ACBL Senior Vice President, W.N. Whitlock.



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Humboldt Express

(continued from page 27)

with a capacity of 700 TEU. The first vessel built with this unique afterbody was a 502-TEU containership constructed at the Heinrich Brand Shipyard in Oldenburg, West Germany. An ice class cargoliner is being built at the same shipyard, and several other vessels that will have the asymmetric stern are now being constructed or programmed for German owners.

Though the asymmetric stern is slightly more complex and therefore a little more expensive to construct, the extra cost of the ship is recovered rapidly in fuel savings. As international shipowners become increasingly aware of the German development, the asymmetric stern may well become as common as the bulbous bow is today. Development work on the new stern design has taken place at the Hamburg model basin over the past 10 years, but it is only the recent steep rise in fuel costs that has brought its advantages home to German shipowners.

Electric power for the Hapag-Lloyd ships is provided by Fuji equipment—two 1,500-kw diesel generators, one 2,200-kw generator, and one 115-kw emergency generator. Steam generation is by an Aalborg oil-fired boiler and an exhaust gas boiler. Two ballast pumps each have a capacity of 600 cubic meters per hour.

Navigation equipment includes two radars, a satellite navigation system, two gyrocompass/autopilots, a magnetic compass, and a weather facsimile unit. The main radio is a 1.5-kw SSB; a VHF radiotelephone is also provided.

HUMBOLDT EXPRESS
Major Suppliers

Main engine	Hyundai/B&W
M.E. remote controls	B.B.C.
Propeller	Ostermann
Shafting	Kobe Steel
Oil-fired boiler	Aalborg
Generators	Fuji
Steering gear	Hatlapa
Bow thruster	Lips
Radars (2)	Krupp Atlas
Satellite navigator	Magnavox
Gyrocompass/autopilot	Anschutz
Weather facsimile	Furuno
Main radio & VHF	Hagenuk
Sewage treatement plant	Sasakura
Windlasses/winches	Broehl
Air conditioning plant	Hi-Press
Cargo crane	Tsuji/Liebherr
Hatch covers	MacGregor
Reefer plant	Sabroe
Container cooling	G&H Montage
Purifiers	Westfalia
Plate coolers	Nagase/Alfa Laval
F.W. generator	Sasakura
Switchboards	Terasaki
Valve remote controls	Plieger
Motor starters	Terasaki
Coatings	Duncker, International Mobil
Lifeboats	Hattecke

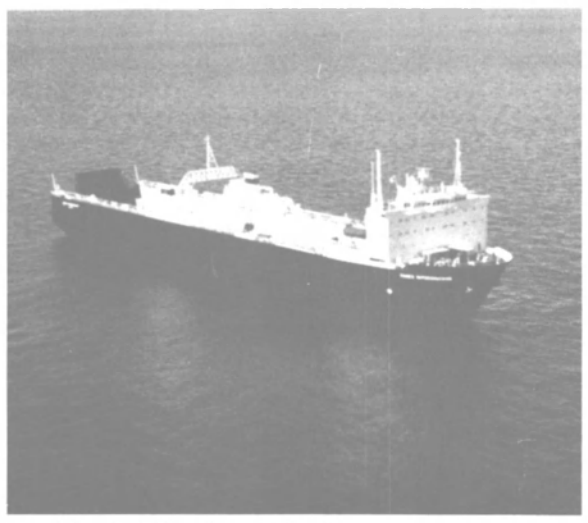
KIHU
Wartsila-Turku

The Turku Shipyards of Oy Wartsila ab in Finland recently delivered the 19,999-dwt products tanker Kihu to Neste Oy, the national oil company of Finland. Less than a year elapsed between her keel laying and delivery. The ship is classed by Lloyd's Register of Ship-

(continued on page 32)

pressure of 11 bar so that high loads carrying containers stacked in three the ship ballasted and de- stalled

Exxon Baytown built by Avondale (see page 25.)



Pavel Antokolskij built by Valmet (see page 33).

Tokai Maru built by Ishikawajima Harima (see page 39).

Kihu

(continued from page 30)

ping + 100 Al, Chemical Tanker, + LMC, IGS, Ice Class 1A. She is an IMO type II/III chemical tanker for worldwide trading of crude oil, refined petroleum products, and type II/III chemicals including benzene, styrene monomer, caustic soda, molasses, urea, solvents, and alcohols.

The vessel has an overall length of about 528 feet, molded beam of 75.8 feet, molded depth to upper deck of 46.6 feet, and draft of 33.2 feet. Total cargo tank capacity (100% full) is 26,644 cubic meters.

Main engines, auxiliary engines, boilers, and inert gas generator are all designed to run from start to stop on one grade of fuel oil—3,500 seconds Redwood at 100 F.

The Wartsila/Pielstick 6PC4.21-570 main engine is coupled through a reduction gear to a KaMeWa controllable-pitch propeller. The engine has a maximum continuous rating of 9,776 bhp at 400 rpm; service speed operating at 82 percent of mcr is 15.5 knots. The ship is fitted with a controllable-pitch bow thruster powered by a 1,340-hp electric motor.

Three Wartsila-Vasa 6R22HF auxiliary diesels are direct-coupled to Stromberg alternators of 935 kva, 450 volts, 60 Hz each. Two oil-fired steam boilers and one exhaust gas steam boiler are installed for ship's service, which include heating of cargo and ballast tanks and cargo tank washing water.

The hull is divided, by two longitudinal and 11 transverse bulkheads, into 10 center tanks and eight wing tanks for cargo, six wing tanks for water ballast, and two slops tanks. Transverse bulkheads are stiffened by corrugations; longitudinal bulkheads in the center cargo tanks are smooth, with stiffeners in the wing tanks. The center tanks are coated with pure epoxy; cargo side tanks are coated with zinc silicate.

Despite being a ship of less than 150 meters BP (492 feet) and less than 20,000 dwt; the Kihu incorporates some of the more stringent requirements applicable to larger vessels. Her damage stability meets most requirements valid for ships above 150 meters; she is fitted with crude oil washing and inert gas systems; and she has segregated ballast water tanks with capacity sufficient for the ship to operate in heavy ice conditions. Hull and propulsion machinery are designed for these conditions, above the requirements of Lloyd's Register Ice Class notation.

The four segregated cargo systems are designed for efficient operation; discharging time is about 12 hours, and loading and deballasting time is above five hours. A cargo computer is connected on-line with level transmitters of cargo, ballast, and bunker tanks, cargo tank temperature system, draft sensors fore

Each cargo tank is equipped with one vertical, centrifugal, hydraulically driven pump of Thune Eureka manufacture. For cargo heating, 18 Sunrod heaters are installed on the main deck. One Maritime Protection inert gas generator is installed in a deckhouse aft. Its capacity is 3,300 cubic meters per hour with a maximum pressure of 0.2 bar.

LEDAGAS
Paul Lindenau

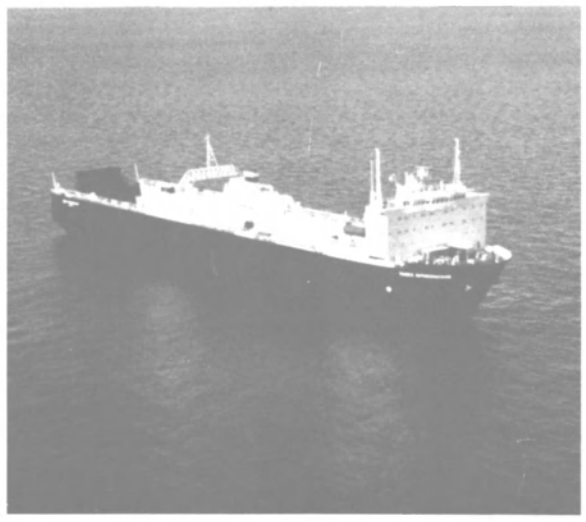
The Paul Lindenau shipyard in Kiel, West Germany, recently delivered the liquefied petroleum gas/ammonia carrier Ledagas to Reederei Hartmann LPG Schiffahrts KG of Leer. This 5,250 cubic meter, third generation gas tanker is of a new design that was worked out in close cooperation with the owner and Liquid Gas International Ingenieurgesellschaft mbH of Bonn. The design is based on Lindenau's many years of experience in realizing economic concepts. Due to the optimal lines of the ship and the use of heat from exhaust gas and cooling water, considerable energy savings were attained.

The Ledagas is 376.6 feet long overall, with a beam of 56.4 feet and draft when carrying LPG of 17.7 feet. The main propulsion engine is a medium-speed MaK 6M551AK with an output of 3,500 bhp at 375 rpm, capable of burning fuel oil of 3,500 sec. Redwood at 100 F; service speed is 14 knots. The ship is built to Germanischer Lloyd classification +100 A4 El Type 2PG "Liquid Gas Tanker" +MC E1 AUT.

Other shipboard equipment includes a Siemens 820-kva shaft-driven generator, Schaffran controllable-pitch propeller, Jastram 220-kw bow thruster, GeKa exhaust gas boiler, Novenco air conditioning, and Debeg satellite communications system.

The four cargo tanks each have a capacity of 1,312.5 cubic meters. The gas plant is designed in such a way that two cooled shipments can be transported at the same time. In order to attain the greatest possible flexibility of operation, the cargo

Exxon Baytown built by Avondale (see page 25.)



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(continued from page 30)

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LEDAGAS
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tanks are designed to hold an overpressure of 11 bar, so that high loading and unloading performance are possible. An inert gas plant is provided to allow fast change of cargoes. This plant is said to be one of the first inert gas plants on a gas tanker that is able to produce nitrogen—a concept of the future.

These two Hartmann LPG tankers meet the highest national and international safety requirements. They will be deployed throughout the world under long-term charter contracts.

LEDAGAS
Major Suppliers

Main engine	MaK
C-P propeller	Schraffran
Bow thruster	Jastram
Shaft-driven generator	Siemens
Exhaust gas boiler	GeKa
Air conditioning	Novenco
SatCom & Fax	Debeg
Radars (2)	Racal Decca
Gyrocompass & autopilot	Anschutz
Echo sounder	Simrad
Direction finder	Debeg

PAVEL ANTOKOLSKIY
Valmet

Valmet's Helsinki Shipyard in Finland recently delivered the second of a pair of 8,638-dwt multipurpose, dock type barge feeder vessels built for the Soviet Union's Danube Shipping Company. The sponsor of the ship, named the Pavel Antokolskiy, was **Mrs. Irene Kankaanpaa,** wife of Valmet Corporation president **Matti Kankaanpaa.**

The new vessel, like her sister ship Boris Polevoy that was delivered earlier this year, will be operated by the Interlighter Shipping Company, which has been maintaining a very successful liner service carrying the 1,000-ton Danube seabarges from the Black Sea down to India, the Bay of Bengal, Burma, Singapore, and Vietnam.

The two new feeder ships will maintain liner service on the Black Sea, Mediterranean, and Red Sea collecting and distributing barges coming down the rivers. These vessels are each able to carry six Danube barges or 12 LASH barges in their wide cargo holds with a deck area of about 3,000 square meters. The watertight stern door also serves as a ramp for RO/RO. When carrying containers stacked in three layers instead of barges, the capacity is 513 TEUs.

The dock type vessels can load directly from the pier or at sea. Barges are floated in or out of the cargo hold by ballasting the vessel using two big pumps, each with a capacity of 1,500 cubic meters per hour. This pumping capacity allows the ships to be ballasted and deballasted in only 12 hours.

Main propulsion is provided by two Wartsila-Vasa 9R32 medium-speed diesel engines with a total output of 7,560 bhp at 750 rpm. Each engine is connected via a flexible coupling and single-stage reduction gear to a controllable-pitch propeller. A bow thruster is also installed. Trial speed was 13.9 knots.

The Pavel Antokolskiy has an overall length of about 521 feet, molded beam of 101.7 feet, maximum operating draft of 14.4 feet, and submerged draft of 30.5 feet. Volume of the cargo hold is about 31,000 cubic meters. She will operate with a crew of 32 persons.

(continued on page 36)

PAVEL ANTOKOLSKIY
Major Suppliers

Main engines (2)	Wartsila/Vasa
Reduction gears (2)	Valmet
Propellers (2)	KaMeWa
Steering gear	C.J. Wennberg
Machinery controls	Stromberg
Alarms & printers	Moland Automation
Oil-fired boiler	Bronswerk Ketel
Exh. gas boilers (2)	Bronswerk Ketel
Autopilot	Kockums
Air conditioning	Valmet Pansio
CO_2 & smoke detectors	Hein-Larssen
Stern ramp	MacGregor-Navire
Anchor/mooring and mooring winches, chain stoppers, deck machinery	Salzgitter Kocks
Lifeboats	Centromor
Electronics & galley equipment	Owner
FO & LO separators	Alfa-Laval

Numb

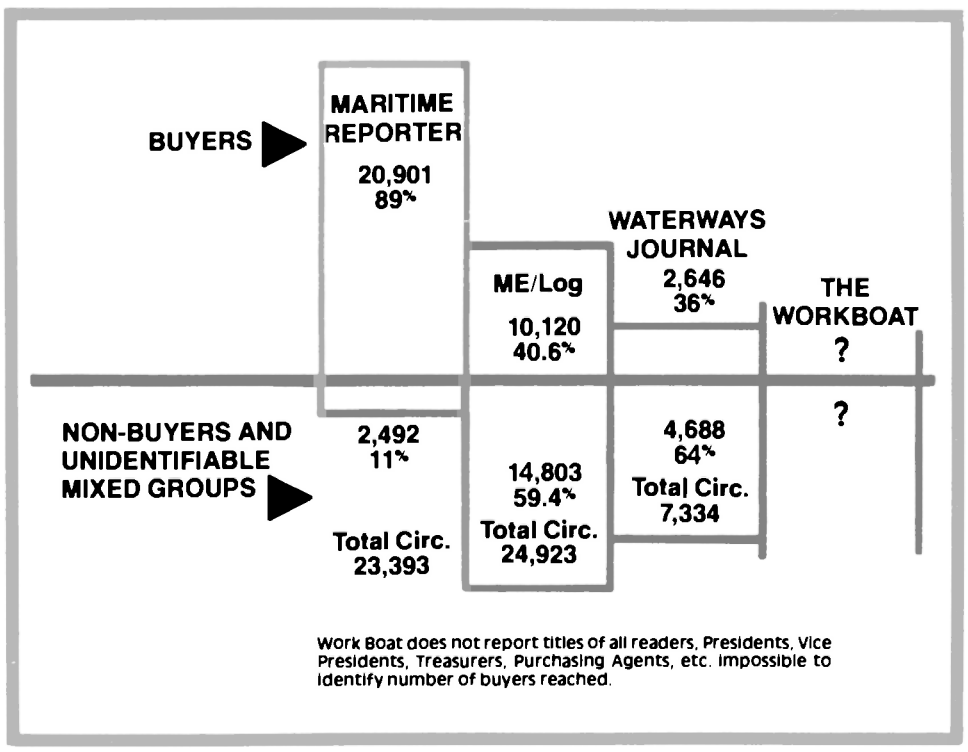
MARITIME REPOR
THE LARGEST INCREASE IN
IN MARINE PUBI

in 1984, MARITIME REPORTER's total circulation increased by thousands to a record 23,323 copies every issue.

This entire increase consisted of only Buying Influence Readers. MARITIME REPORTER now delivers your advertising to an unequalled 20,901 buying influence readers...

WORLD'S LARGEST CIRCULATION TO BUYERS

Now, MARITIME REPORTER delivers your advertising to 20,901 identifiable buyers...over twice the number 2 magazine.



THE BEST ADVER

MARITIME REPORTER produces m other Marine magazine...two ti number 2 magazine. Each figure for an individual advertiser by MA

Paints/Corrosion Control
756
657
655

Shipbuilding/Repair N
2,147
613
547

Deck Machinery/ Cargo Handling
523
419
395

THOUSANDS MORE BUYERS . . . FOR BE

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thousands more than ever before...and thousands more than any other Marine magazine in the entire world.

Here is complete and unmatched coverage of your entire marine buying market...for maximum advertising results in 1984-1985.

TISING RESULTS

re and better sales leads than any
s and three times more than the
sted represents inquiries produced
ITIME REPORTER in one year or less.

Diesel Engines
1,168
1,153
1,123

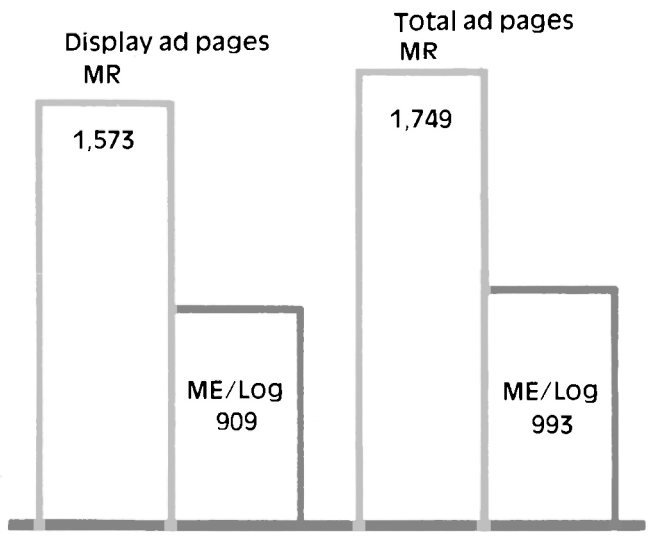
vigation & Communications
663
621
590

Oily Water Separators
756
459
360

THE ADVERTISING LEADER

In 1983, and for years, more media buyers placed more pages of advertising, for a larger number of advertisers, in MR than in No. 2, ME/Log.

COMPARE 1983 ADVERTISING



Note — shows only magazine advertising 13 ME/Log issues — 24 MR issues . . . no catalogs, buyers guides, etc. Ad pages reported in 7" x 10" units for comparision.

And in the first 6 months of 1984, MARITIME REPORTER carried more pages of advertising than No. 2, ME/Log.

MR clearly leads by a wide margin in advertiser acceptance.

ST ADVERTISING RESULTS

December 1, 1984

MARITIME REPORTER AND ENGINEERING NEWS

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New York, New York 10016
(212) 689-3266

ROYAL PRINCESS
Wartsila-Helsinki

The 45,000-gt cruise liner Royal Princess was delivered to her owner, The Peninsular and Orient Steam Navigation Company, on October 30 this year. The luxury vessel represents a completely new passenger liner concept, all outside cabin, introduced by Wartsila and developed jointly with the P&O technical staff. She is the 35th passenger vessel and the 15th cruise ship deliverd by the Helsinki Shipyard.

Through this concept, all of the ship's 600 passenger cabins have natural light from large picture windows. In addition, 152 deluxe staterooms and suites have private balconies. All cabins have bathrooms with showers, color television sets connected to the ship's central information system, and twin beds that are convertible into doubles. The air-conditioning system will be a high-economy, rotary heat exchanger design, with individual cabin control and no recirculation.

The 1,200-passenger Royal Princess has an overall length of 757.85 feet, molded beam of 95.80 feet, and design draft of 25.59 feet. The eight-deck ship will be classed by Lloyd's Register of Shipping and will fly the British flag. Service speed will be 22 knots.

Main propulsion will be by four Wartsila/Pielstick 6PC4-2L diesel engines, each developing 9,900 bhp and designed to burn 600 CST fuel oil. The engines will be arranged in pairs, each pair driving a KaMeWa heavily skewed, controllable pitch propeller through reduction gearing. Each main engine will also drive an alternator through the same gearing. All four engines will be fitted with economizers, thus all normal energy demands will be fulfilled with the use of heavy fuel. Two 750-kw KaMeWa bow thrusters are installed in the hull, as is a pair of Sperry Marine fin stabilizers.

Two standby alternators, each developing 950 kw at 1,200 rpm, will be driven by Wartsila-Vasa 6R22 diesel engines. Two evaporators using waste heat from the main engine cooling water or steam from the two boilers will each have a capacity of 30 tons per day.

A biological sewage treatment plant is to be fitted, and a comprehensive system for garbage treatment, including two Hamworthy incinerators, will be installed. Stores will be loaded through two large, two-deck-high doors on each side of the ship. Special pallet loaders will be fitted at each door, and conveyors will be used where pallets are not available. The underwater hull will be coated with self-polishing paint.

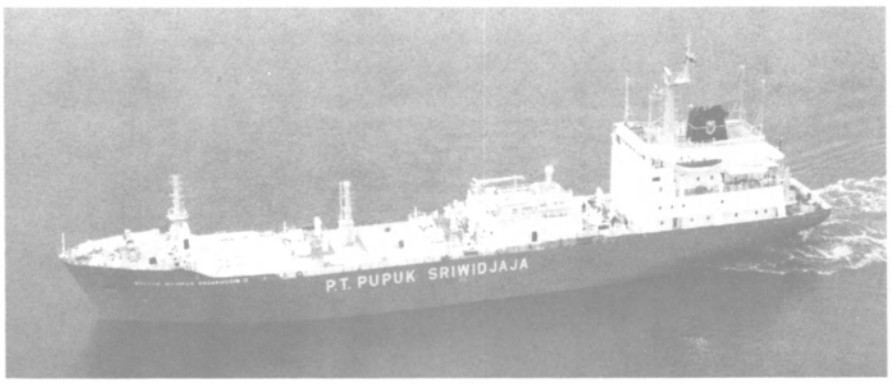
As safety measures, accommodations areas will be protected by sprinklers, and the machinery spaces will be fitted with a Halon fire extinguishing system. Lifesaving equipment is being designed to comply with the latest Intergovernmental Maritime Organization requirements.

Public rooms will include a central foyer/reception area, restaurant, show lounge, nightclub, central lounge, disco/observation lounge, casino, library, cinema with full conference facilities, and a health center with sauna and gymnasium. Two pools and two whirlpool baths will be installed on the open decks.

Passenger accommodations, some senior officers' cabins, and certain public rooms and bars, as well as the crew's mess and recreation rooms, will be served by a closed-circuit TV system that will provide four off-air channels, two video channels, one live on-board channel and an information system.

The ship will be fitted with a wide range of modern navigation and communications equipment, including a radio station, radars, radio direction finder, depth sounders, satellite communications gear, and a Magnavox satellite navigation system. A computer will be installed to handle all accounts, passenger and crew data, and ship management functions.

The crew of approximately 500 will be berthed in single and double cabins, all with private facilities. Each cabin will have a TV and radio aerial outlet. In addition to restaurants, crew amenities will include a swimming pool, quiet room, gymnasium, and recreation rooms.



SULTAN MAHMUD BADARUDDIN II
Meyer Werft

The liquefied gas carrier Sultan Mahmud Badaruddin II was delivered recently by Jos. L. Meyer GmbH & Company in Papenburg, West Germany, to P.T. Pupuk Sriwidjaja (Pusri) of Indonesia. Pusri is a state-owned fertilizer manufacturer and distributor, with responsibility for distributrion of all fertilizer and fertilizer-related products in Indonesia.

The vessel is the first semi-refrigerated liquefied gas carrier in Indonesia and in Pusri's fleet of modern self-unloading urea carriers. It is designed to transport ammonia from a new ammonia/urea production facility in Kalimantan on the island of Borneo to domestic and foreign ports in Southeast Asia.

The gas carrier is 372 feet long overall, with a beam of 53.5 feet and depth of 35.75 feet; cargo tank capacity is 5,683 cubic meters. Cargo is carried in three independent bilobe tanks at a temperature of —48 C and pressure up to 4.5 bar. It is capable of transporting ammonia, propane, butane, butadiene, propylene, and vinyl chloride monomer. Cargo is cooled by a reliquefaction plant that includes two Sulzer compressors. Six deepwell pumps discharge cargo at a combined rate of 540 cubic meters per hour.

Propulsion power is provided by a MaK 8M 552 diesel engine that produces 6,200 bhp at 500 rpm, and a speed of about 15.7 knots. Power is transmitted through a Lohmann + Stolterfoht to give the Ostermann propeller a speed of 156.6 rpm.

Electrical power is supplied by three Taijo generators driven by Daihatsu diesels each with an output of 550 kw. The main engine and the generator diesel are capable of burning heavy fuel oil of 107.5 sec Redwood I.

The vessel has a dual classification, with Lloyd's Register of Shipping and Biro Klasifikasi Indonesia as a Type IIC Liquefied Gas Carrier, and is provided with an IMO certificate according to the Gas Code, Resolution A328(IX). The carrier also complies with U.S. Coast Guard regulations for ships under foreign flag.

Accommodations are provided for

SULTAN MAHMUD B. II
Major Suppliers

Main engine	Krupp/MaK
Turbocharger	BBC
Gear & coupling	Lohmann & Stolterfoht
Shaft seals	HDW
Propeller	Ostermann
Aux. engines (3)	Daihatsu
Generators (3)	Taiyo
Emergency generator	Janssen
Electric motors	AEG
Fresh water cooler	Alfa-Laval
Sewage plant	Hamworthy
Incinerator	Format Chemie
Fresh water generator	Alfa-Laval
Bow thruster	KaMeWa
Main switchboard	Janssen
Steering gear	Hatlapa
Hydraulic pumps	Rexroth
Anchor/mooring winches, cranes	Hatlapa
Compressors	Sulzer
Deepwell pumps	Svanehoj
Air conditioning	Bronswerk
Fire ext. systems	Preussag Minimax
Gyrocompass	Plath
Echo sounder	Atlas
SatNav, radars, radios, RDF, log	JRC
Galley equipment	Scantina
FO & LO separators	Alfa-Laval

a crew of 34 in 16 single and nine double cabins. Navigation equipment includes two radars, gyrocompass with autopilot, echo sounder, speed log, and satellite navigation system. The ship is equipped with a radiotelephone system and two separate VHF radio units.

Marine Consultants & Designers, Inc. of Cleveland, designers of Pusri's self-unloading urea carriers, provided a transportation study to define the ammonia carrier's requirements and speed, prepared the design and specifications for tendering and contract documents, and represented Pusri during tendering, contract negotiations, and construction, providing both plan review and construction supervision. Marine Consultants & Designers was assisted in these tasks by Intership Services, Inc. of Waltham, Mass., who provided design and consultation for the liquefied gas aspects of the project.

THOROUGHBRED TOPPER
Bay Shipbuilding

Bay Shipbuilding Corporation of Sturgeon Bay, Wisc., a subsidiary of The Manitowoc Company, recently delivered the oceangoing coal top-off barge Thoroughbred Topper to Lamberts Point Barge Company, a subsidiary of the Norfolk Southern Corporation of Norfolk, Va. The big 33,000-dwt vessel will be operated by Coastal Barge Corporation, a subsidiary of the Dowd Group of New York.

The Topper will be used primarily for topping off partially loaded, oceangoing bulk coal carriers of such size that they have too deep a draft to be completly loaded at U.S. coal-loading terminals. This procedure will allow vessels that receive a partial load of cargo at the coal docks to proceed to deeper water, where they will be topped off to full cargo capacity.

The barge has an overall length of 550 feet, beam of 78 feet, and draft of 34 feet; capacity is in excess of 36,000 short tons of coal. She is fitted with a deep stern notch to accommodate a 7,200-bhp tug. The barge is equipped with hydraulically controlled skegs to maintain directional stability while under tow. A 1,000-hp, fixed-pitch bow thruster provides additional maneuverability.

Bay Ship's parent, The Manitowoc Company, provided two 4600 Series-3 clamshell cranes that provide the barge with self-loading, unloading, and transfer capabilities in excess of 1,500 tons per hour. The two 4600s rotate on special 16-foot roller paths mounted atop self-propelled gantries that travel on rails along the length of the four cargo holds. The gantries, manufactured by Bay, also serve as hatch cover cranes. Each crane is equipped with a 120-foot boom and provides 50,000-pound clamshell capacity. In addition, each is equipped with an operator's module to provide optimum visibility for loading.

The Thoroughbred Topper complies with all regulations of the U.S. Coast Guard, and is classed by the American Bureau of Shipping +A1 Barge, Unrestricted Ocean Service.

(continued on page 38)

THOROUGHBRED TOPPER
Major Suppliers

Clamshell cranes	Manitowoc Engineering
Crane gantries	Bay Shipbuilding
SS diesel generator sets	Stewart & Stevenson
Switchboards	Bay Ship
Ballast & general service pumps	Goulds Pump
Anchor/mooring winches	New England Trawler
Bow thruster	Bird-Johnson
Bow truster diesel	Ohio Machinery
Paint coating system	Devoe Marine
Ballast tank coating	Eureka Chemical

Outstanding Oceangoing Ships Review—

(continued from page 37)

TOHKAI MARU
Ishikawajima-Harima

The Kure Shipyard of Ishikawajima-Harima Heavy Industries in Japan in the spring of this year completed one of its biggest jobs in recent years when it delivered the very large crude carrier Tohkai Maru to Daikyo Tanker Company, that company's first VLCC.

This 238,500-dwt tanker was designed using two fuel-efficient main engines together with the supereconomical shaft generator system (SSG Mark II); the IHI LV hull form that was developed for large full-form, low-speed vessels to improve energy efficiency; and the AT fins that can recover the energy of rotational flow aft of the propeller that has so far been wasted.

The design of the new tanker also includes innovative automation systems to reduce manning to a complement of 16, provide ease of operation and maintenance, and many other features.

The ship has an overall length of 1,035 feet, beam of 178.8 feet, depth of 99.4 feet, and full-load draft of 64.56 feet. A flush decker with engine room and all accommodations aft, she has 13 cargo oil tanks in three rows, and large, segregated ballast tanks to meet MARPOL requirements

Main propulsion is by two IHI/S.E.M.T. Pielstick 8PC4 diesel engines with exhaust turbocharger, driving a single controllable-pitch propeller through a reduction gear. Propeller speed and pitch, main engine load, ship speed, and other factors can be controlled to meet specific maneuvering conditions.

The two medium-speed engines deliver a maximum continuous total output of 24,000 bhp at rpm; the reduction gear reduces the speed of the 30-foot-diameter propeller to 69.3 rpm. This low-speed, large-diameter propeller provides high propulsion efficiency.

In the SSG Mark II system, the reduction gear is coupled mechanically to the turbogenerators through a speed-changing clutch to feed part of the main engine output to the generators when the turbines alone cannot meet the on-board electricity demand, or to feed excess output of the turbines back to the propulsion system. All this is done automatically.

The main engines and the controllable-pitch propeller are regulated by IHI's electronic remote control system either in the wheelhouse or in the engine control room, whichever is suitable for the occasion.

Automation and fuel economy were the two main aims in designing the propulsion system. They save fuel cost, the SSG Mark II system is employed to recover heat from the main engines. It is combined with the two-engine/single-screw shafting and c-p propeller to insure maximum fuel efficiency over a wide range of operation from slow to fast running. Automation of the entire system was studied extensively to guarantee safety.

All of the operations of the SSG Mark II system can be performed with a single switch in the engine control room. The statuses of the system are displayed and monitored on a graphic panel.

The steam plant is made up of an auxiliary boiler, a high-pressure exhaust gas economizer, a medium-pressure exhaust gas economizer, a low-pressure exhaust gas economizer, and a charging air economizer. When at anchor or leaving or entering port, the auxiliary boiler is fired to generate steam. At sea, it is used as a separator for the high-pressure exhaust gas economizer to generate and feed saturated steam to the generator turbine and other equipment. The medium-pressure exhaust gas economizer is equipped with a dedicated separator to generate steam to be used for miscellaneous purposes.

The engine control room is arranged alongside the cargo control room on the boat deck in the accommodations area. It contains control and monitoring equipment for all machinery. An elevator between the boat deck and the lower engine room flat provides quick personnel transit.

Driving a variable-pitch propeller by two medium-speed diesel main engines was a first such experience for IHI. In implementing this new system for energy-efficient operation, arrangement of the engine room equipment was studied with utmost care.

The Tohkai Maru has been built with designed-in energy-efficient and labor-saving features in response to the needs and wants of the new era. Running foremost in shipbuilding technology, this new ship represents innovations in instrumentation, automation, and systems engineering.

Armco's Baltimore Precision Forging Complex Now In Full Operation

Armco Inc. president **Robert E. Boni** was present at opening of new forging complex.

The precision rotary forging complex of Armco's Stainless Steel Division is part of a $30-million program to add new forging and casting capabilities at its Baltimore Works. Steel billets, bar, and other forged shapes produced by the new equipment are used in the marine and energy markets as boat shafts, engine and generator shafts and couplings, drill collars, gears, and numerous other products, including forging stock for open and closed die forgings.

"The finished products have significantly improved mechanical properties and surface quality, among other things," said **T. W. Harris,** works manager. "Productivity and flexibility is far greater than possible with most conventional forging processes."

He said the precision rotary forging machine is the latest generation of forging equipment and, in addition to improving quality, produces far straighter products of up to 38 feet in length, and allows tighter dimensional tolerances.

Sophisticated computers make this equipment remarkably precise in an industry that hasn't had the luxury of precision," Mr. **Harris** added. "We are able to produce wrought products with hot-worked tolerances much closer than those specified by the American Iron & Steel Institute."

The precision rotary forging machine, model SX-55, was manufactured by Gesellschaft fur Fertingungstechnik und Maschinenbau AG of Steyr, Austria. It is capable of hot-working 300 and 400 series stainless steel, precipitation-hardening alloys, and Armco's proprietary Nitronic grades.

The highly automated forging process has several stages. First, large manipulators or "chuckheads" grab hot ingots or billets delivered by conveyor from a new rotary hearth furnace, place them into the forging machine, and rotate and position the workpiece during the forging process.

Forging is done with four high-powered hammers striking the workpiece at the rate of 200 strokes per minute. Each stroke reduces the diameter of the ingot and increases the length until the billet bar or the desired shape is completed. The hammers, working simultaneously to exert equal pressure on all sides of the piece, refine cast grain structure and can contribute enough energy to give isothermal reduction—an advantage for stainless grades with narrow hot-working ranges.

The manipulators feed and rotate the piece so that it will not be moving at the instant the hammers strike. This eliminates the problem of twist and stretch that can mar the quality of the forged piece.

The finished workpiece is removed from the machine by a transfer mechanism with supports to preserve straightness. It is placed on a conveyor and taken to a hot abrasive saw for cropping and cutting into lengths needed for the final products. Finally, the piece is taken to a cooling bed or a water quench tank, depending upon the grade.

The finished product has excellent surface quality, improved mechanical properties, and better straightness than forging produced by conventional methods, said **Dennis Jensen,** general foreman of precision rotary forging.

Round forged shapes can be produced as small as 3¾ inches in diameter, and flat forged shapes can be produced with cross sections ranging from 2½ by 4 inches to 12 by 14 inches. All configurations can be made up to 38 feet long with a maximum piece weight of 6 tons.

A new 60-foot diameter rotary hearth furnace has been installed adjacent to the forging machine. This furnace receives ingots from a walking-beam conveyor and heats the ingots to the proper forging temperature. An automatic discharge machine then pulls the ingot out of the furnace and places it on the forging line within a minute.

Operators can use computers to direct and monitor the complete forging operation or, if desired, can operate the machine manually or semi-automatically. Forging times can be reduced from up to six hours to as little as 6 minutes, depending on the alloy, conditioning requirements, and finished product.

The machine is capable of forging

Precision forging machine in operation at Armco's expanded Baltimore Works.

several shapes on a single bar, giving the mill flexibility in handling smaller orders or orders for unusual shapes and sizes beyond the typical rounds, squares, and flats produced in the normal forging process.

The rotary hearth, handling equipment, forging machine, abrasive saw, and quench tanks are all installed in a 35,000-square-foot addition to the existing bar mill complex. The addition was designed, engineered, and constructed by other Armco business units, including Armco Building Systems of Sharonville, Ohio; Bovay Engineers of Houston; Burns & McDonnell of Kansas City, Mo.; Encorp of Blue Ash, Ohio; and the Armco Construction Products Division of Middletown, Ohio.

Also on stream is a new state-of-the-art horizontal continuous caster, a first in the U.S. specialty steel industry. Both the forging machine and caster are part of the second phase of a three-phase program to modernize Armco's Baltimore Works, according to works manager **Thomas Harris.** The first phase included installation of a top-charge electric furnace, a rotary hearth rod and wire annealing furnace, and a rough bar turner. Phase three will involve rolling facilities, Mr. **Harris** said.

The Baltimore-based Stainless Steel Division produces ingots, billets, bar, rod, and wire products; it also produces stainless flat-rolled products at the Butler Works in Butler, Pa., and stainless pipe and tube products in Wildwood, Fla. Armco Inc., the parent company, is based in Middletown, Ohio.

Armco is offering a new color brochure describing the capabilities and products of the precision rotary forge; for a free copy,

Circle 35 on Reader Service Card

Capt. J. Graham Appointed Vice President, Operations, Gulfcoast Transit Company

John G. Graham

Gene Flood, president of Gulfcoast Transit Company, recently announced the appointment of Capt. **John G. Graham** to the position of vice president of operations, Gulfcoast Transit Company.

Captain **Graham** has been employed with the company since October 1972 in a variety of positions which have included master, port captain, operations manager and general manager. Captain **Graham** is a member of the Towing Safety Advisory Committee of the U.S. Department of Transportation.

Mrs. Margaret Jill Hart christens the vessel named in her honor. Looking on are: (left to right) **John J. Kelly,** senior vice president and general manager, Bell Aerospace Textron, New Orleans operations, and president, Bell Halter, Inc.: **Dennis Hart,** and the Reverend **Gregory Deane.**

The Bell Halter-built M/V Margaret Jill, shown above, will operate as a crewboat in the oil fields in the Gulf of Suez, offshore Egypt.

Surface Effect Ship Margaret Jill Christened In New Orleans

The Surface Effect Ship M/V Margaret Jill, built by Bell Halter Inc., was recently christened by her namesake, Mrs. **Margaret Jill Hart,** wife of an Offshore GAC Services, Ltd. executive. The ceremony was conducted aboard the vessel, which was docked at the Louisiana World Exposition following demonstration rides on the Mississippi River.

Offshore GAC Services Ltd. will operate the M/V Margaret Jill as a crewboat in the oil fields in the Gulf of Suez, offshore Egypt. The vessel is an air-supported craft with catamaran-style rigid sidehulls. A cushion of air trapped between sidehulls and flexible bow and stern seals lifts a large part of the sidehulls clear of the water to reduce drag, thereby producing greater efficiency and higher speed. The lower parts of the sidehulls remain in the water to aid in stability and maneuverability of the craft.

The Margaret Jill departed New Orleans following the commissioning ceremony and will begin operations in Egypt before the end of this year.

Free Jered Brown Brochure Highlights Denny Brown Folding Fin Stabilizers

A new 16-page four-color brochure on Denny Brown folding fin stabilizers is being offered free by Jered Brown Brothers Inc. of Troy, Mich.

Filled with photos, illustrations, charts, features and benefits of the Brown Brothers complete system of folding fin stabilization, the publication starts with an introduction which states that the purpose of the brochure is to provide a brief glimpse into the fascinating world of ship motion control systems technology. This is followed by a page on the evolution of ship stabilization, with a listing of milestones in its development. Also included are detailed sections on how the Denny Brown system operates, a guide to fin selection, the hydraulic system that powers it, and the state-of-the-art electronics that control it.

Stabilizers reduce ship roll by using fins projecting from the side of the hull. Micro processor controls sense the ship's motion and computer demand signals for the hydraulic power units to tilt the fins to the correct angle to generate lift and damp out roll. A guide for computing the most efficient system is provided along with detailed specifications on power and control units. Brown Brothers operates on a worldwide basis and is a Vickers Marine Engineering Company.

For a free copy of the brochure

Denny Brown
Folding Fin Stabilisers

and further information on Denny Brown folding fin stabilizers,

Circle 37 on Reader Service Card

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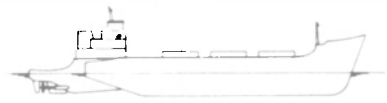

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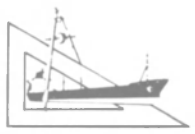

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The Memphis fireboat, shown aboard its transporter trailer, can achieve a cruising speed in excess of 27 miles per hour.

MonArk Boat Delivers Fireboat To City Of Memphis

The City of Memphis has received and placed into service a fireboat made by MonArk Boat Company of Monticello, Ark. The fireboat, MonArk's Model 2609, will be used by the Memphis Fire Department in responding to waterfront fires and emergencies on the Mississippi River. The Memphis fireboat and its transporter trailer, also manufactured by MonArk, were delivered to the city in June.

The Memphis craft is the first fireboat of its size produced in the U.S. containing three diesel engines for propulsion and pumping requirements. The diesels were chosen as the propulsion system so that additional hazards would not be encountered by the use of gasoline engines. The boat was constructed in accordance with the specifications and design requirements of the Fire Department for the City of Memphis.

The all-welded aluminum hull, combined with the twin Cummins Model 6BT 5.9-litre marine diesels enables the boat to achieve a cruising speed in excess of 27 mph. In addition to the twin Cummins propulsion engines, the main pump systems are powered by a Cummins Model 6BT 5.9 litre diesel. These are the first Cummins engines of this model and type installed in a workboat application.

The fire-fighting systems are powered by Hale Model 60FJ-M pump rated at 1,200 gpm. The boat is equipped with a forward deck monitor, Elkhart Model 294-11X rated at 1,100 gpm; the monitor is equipped with a CSW Select-O-Flow nozzle and foam stem. Two spill fire protection sprays, Elkhart Model NTL-CF 1 inch, are located under the forward deck with a remote control at the operator's console. The boat contains a 100-gallon foam tank capable of discharging 3 or 6 percent concentrate through the forward monitor or spill protection nozzles.

Electric systems on the boat include a Raytheon Model 1200, 12-mile range radar and a Raytheon Model D250 fathometer.

Halifax Yard Appoints Keppel As U.S. Agent —Literature Available

Keppel Marine Agencies, Inc., with offices in New York and Houston, has recently been appointed exclusive agent in the United States for Halifax Industries Ltd. of Halifax, Nova Scotia, Canada.

Halifax Shipyard in 1983 increased its drydocking capacity to vessels of about 100,000 dwt with the arrival of its new $63.5-million Panamax floating drydock.

For further information and descriptive literature,

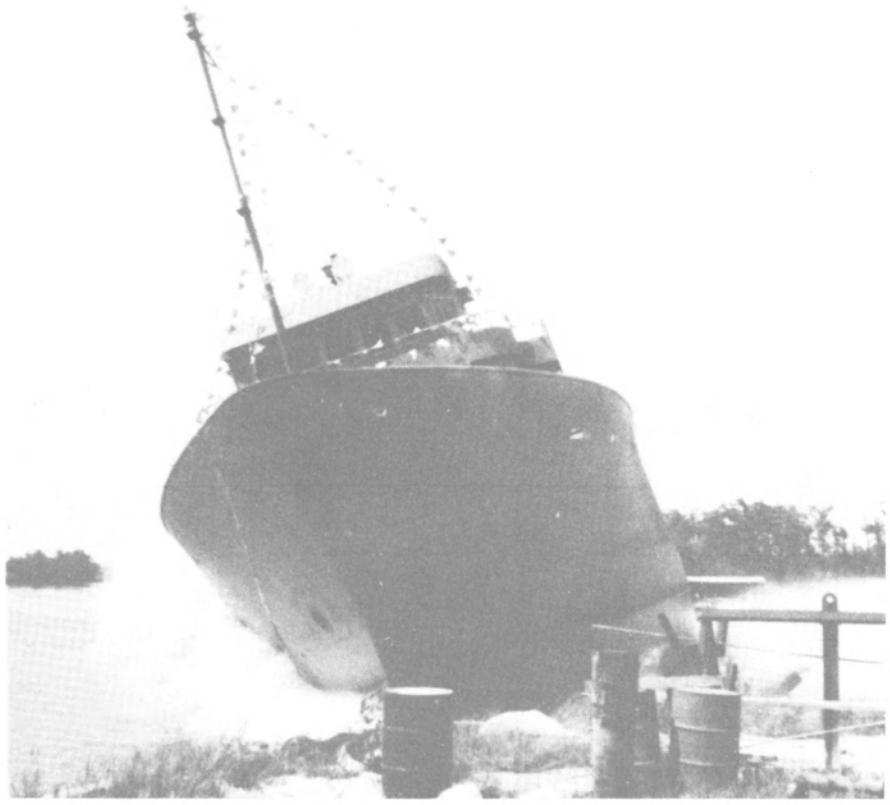
Circle 26 on Reader Service Card

PROFESSIONAL

(CONTINUED)

Moss Point Marine Launches Supply Boat For Argosy Offshore

Moss Point Marine, Inc. recently christened and launched the Argosy Navigator (shown below) fourth of five supply boats being built for Argosy Offshore Ltd. of Lafayette, La. She was christened by **Lucille Taylor,** wife of **William R. Taylor,** vice president and division general manager, Central Gulf Division, Tenneco Oil Exploration and Production Company. When completed, the vessel will work for Tenneco in the Gulf of Mexico.



The all-steel supply boat is 181 feet long with a beam of 40 feet and 14-foot depth. She is powered by two fuel-efficient Caterpillar 3512 engines developing a total of 2,400 bhp. These diesels drive two 80-inch-diameter, four-bladed propellers through Caterpillar reverse/reduction gears having a ratio of 5.11:1.

The vessel can carry 4,000 cubic feet of dry drilling mud and 1,540 barrels of liquid mud below deck, and about 600 long tons of cargo on her 3,800-square-foot aft deck. Fuel capacity is approximately 61,000 gallons and fresh water 11,000 gallons. Accommodations are provided for 15 persons.

Argosy Navigator is classed by the American Bureau of Shipping +A1, AMS, and meets applicable U.S. Coast Guard and Public Health Service regulations. She will soon join her Moss Point Marine-built sister vessels Argosy Captain, Argosy Admiral, and Argosy Commander, and will be followed by another identical boat, the Argosy Pilot.

Earlier this year Moss point delivered the Argosy Mate and Argosy Chief, two 140-foot vessels that serve as standby rescue and supply boats in the Gulf of Mexico.

Sea Float Buoys Approved By Norwegian Maritime Directorate

To obtain approval of the Norwegian Maritime Directorate for use of its buoys in the North Sea, Seaward International, Inc. recently held collision trials of one of its Sea Float buoys in Stavanger, Norway.

The buoy tested was an anchor pendant buoy of 20,000 pounds or 9 tons net buoyancy—hawse pipe style with top and bottom bellmouths. The lower hawse pipe was counter-weighted to provide upright stability even without a pendant wire. The basic buoy construction has a high density rigid foam core bonded to an internal steel core. A layer of resilient foam is then added and covered with a one inch-filament reinforced elastomer skin.

The Norwegian Maritime Directorate required collision trials of the Sea Float buoy with a wooden fishing boat at a speed of 8 to 10 knots to insure the safety of vessels that might collide with a loose or drifting buoy.

There was no damage to the buoy or vessel during any of the collision trials and the personnel aboard the vessel reported that the impacts were barely noticeable.

For additional information on Seaward International's complete line of Sea Float buoys and floats,

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Tracor Hydronautics Delivers Part Task Ship-Handling Simulator To Panama Canal Commission

Tracor Hydronautics recently delivered a Part Task Training Aid Marine Simulator to the Panama Canal Commission. The simulator is now located in Balboa, Republic of Panama. It will be used as part of an overall program in the training of pilots for the Panama Canal in ship handling.

The simulator was purchased from Tracor Hydronautics as a result of a competitive procurement based on specifications and requirements developed by the Panama Canal Commission. The system supplied was based on an evolution of a similar system already developed by Tracor.

The Panama Canal Commission Part Task Simulator consists of a student's station and an instructor's station. The student's station includes a 19-inch color CRT display showing a bird's-eye view of own ship and its surroundings; it also includes a graphical CRT display of ship control information. The instructor's station contains duplicates of the student's station displays as well as a ship control console, a CRT terminal to control the simulator and a plotter and printer. The complete system runs on a Micro/PDP 11 computer from the Digital Equipment Corporation.

For free literature describing the Tracor Hydronautics system,

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Pictured above with the simulator are (from left to right): **Bent K. Jakobsen,** Tracor Hydronautics; Capt. **G. A. McDonald;** Capt. **Robert D. Valentine;**Capt. **George A. Markham;** and **Heidi Steiner** of Panama Canal Commission.

New York Section SNAME Meeting Discusses Drydock Certification

A recent meeting of the New York Metropolitan Section of The Society of Naval Architects and Marine Engineers was held at the American Bureau of Shipping Building, a new location for the Section's meetings. A paper titled "Criteria for Capacity Certification of Drydocks and Significance of Classification and U.S. Navy Standards as They Affect Ship Safety" was presented by **Paul S. Crandall,** president of Crandall Dry Dock Engineers, Inc.

Extremely expensive and sensitive warships, as well as valuable merchant ships, are being handled in a wide variety of drydocks, Mr. **Crandall** said, many of them not originally built for modern vessels and often operated by personnel with very rudimentary training and experience and with limited engineering back-up. Only since 1973 has Lloyd's Register of Shipping published rules for steel floating drydocks, and the American Bureau of Shipping rules were created only recently.

Following the example of the Fifth Naval District, the Naval Sea Systems Command in Washington started the MIL-STD-1625 code using very limited personnel and funds to prepare a drydock certification program to attempt to insure ship safety in all docks.

The honored guest at the meeting was **Alvin E. Cox.** He retired from J.J. Henry Co., Inc. as a vice president, and has been an active member of SNAME for more than 40 years.

Principals at recent N.Y. Section SNAME meeting included (seated, L to R): **Paul S. Crandall,** author, president of Crandell Dry Dock Engineers; **William H. Garzke Jr.,** chairman; **Alvin E. Cox,** honored guest; standing are **Daniel Savitsky,** co-chairman of Papers Committee; and **John H. Higginbotham,** vice chairman.

BUYERS DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER/Engineering News. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all 24 issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR/EN assumes no responsibility for errors. **If you are interested in having your company listed in this Buyers Directory Section, contact John C. O'Malley at (212) 689-3266.**

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Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England
Gulf International Divers, P.O. Box 1342, Gretna (New Orleans), LA 70052
Pacific Maine Services, TLX: 664540 seaserv, Long Beach, CA 90802
Petrochemical Services, Inc., 3820 Dauphine St., New Orleans, LA 70117
Phosmarine Equipment, 21 Bd. de Paris, 13002, Marseille, France
Seaward Marine Services, Inc., 6269 Leesburg Pike, Falls Church, VA 22044
Taylor Diving & Salvage Co. Inc., 701 Engineers Rd., Belle Chasse, LA 70037

HYDRAULICS
Aeroquip Corp., 1130 Maynard Road, Jackson, MI 49202
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
Del Gavio Marine Hydraulics Inc., 207 W. Central Ave., Maywood, NJ 07607
Hydra-Dynamics, Inc., 2141 Greenwood Ave., Wilmette, IL 60091
Washington Chain & Supply, Inc., P.O. Box 3646, Seattle, WA 98124

INERT GAS—Generators—Systems
Foster Wheeler Boiler Corp., 110 So. Orange Ave., Livingston, NJ 07039
Maritime Protection A/S, N. American Agents, American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906

INSULATION—Cloth, Fiberglass
Bailey, Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
Superior Energies, Inc. P.O. Drawer 386, Groves, TX 72619
Waco Inc., 5450 Lewis Rd., P.O. Box 836, Sandston, VA 23150-0836

INSURANCE
Adams & Porter, 510 Bering Dr., Houston, TX 77057-1408
Adams & Porter, 1 World Trade Center, Suite 8433, New York, NY 10048
MGA International, 419 Park Avenue South, New York, NY 10016
United States P&I Agency, Inc., 80 Maiden Lane. New York, NY 10038

JOINER—Watertight Doors—Paneling
Advanced Structures Corp., 235 W. Industry Ct., Deer Park, NY 11729
Bailey Distributors, Inc., 74 Sullivan St., Brooklyn, NY 11231
Masonite Commercial Division, Dover, OH 44622
Megadoor Inc., 441 Lexington Ave., Suite 903, New York, NY 10017
Walz & Krenzer, Inc., 400 Trabold Road, Rochester, NY 14624

KEEL COOKERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
ACR Electronics, Inc., P.O. Box 2148, Hollywood, FL 33022
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Oreck Corp., 100 Plantation Rd., New Orleans, LA 70123
Perko Inc., P.O. Box 6400D, Miami, FL 33164
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209

LINE BLINDS
Stacey/Fetterolf Corp., P.O. Box 103, Skippack. PA 19474

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
A-C Brake Co., 308 E. College St., Louisville, KY
Jered Brown Brothers Inc., 1300 Coolidge, P.O. Box 2006, Troy, MI 48007
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080
Rosan, Inc., 2901 West Coast Hwy., Newport Beach, CA 92663

METALS
Bayou Steel Corp., P.O. Box 5000, Laplace, LA 70068

MINING
Rocky Mountain Energy, 10 Longspeake Dr., Box 2000, Broomfield, CO 80020

MOORING SYSTEMS
Murdock Machine & Engineering Company of Texas, P.O. Box 2278, Irving, TX 75061
Samson Ocean Systems, Inc., 99 High Street, Boston, MA 02110

NAME PLATES—BRONZE—ALUMINUM
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Highway (Suite 1300), Arlington, VA 22202
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Systems Engineering Corp., P.O. Box 4265, Virginia Beach, VA 23454
Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, MD 20015
Art Anderson Associates, 148 First St., Bremerton, WA 98310
B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C. Canada V6S 2L2
Del Breit inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
C.A.C.I., Inc., 1815 No. Fort Myer Dr., Arlington, VA 22209
C.D.I. Marine Co., 5520 Los Santos Way, Suite 600, Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829
Phillips Cartner & Co., Inc., 203 So. Union St., Alexandria, VA 22314
Century Engineering, inc., 32 West Rd., Towson, MD 21204
Childs Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, MA 02026
Crane Consultants Inc., 15301 1st Ave., So. Seattle, WA 98148
C.R. Cushing & Co., Inc., One World Trade Center, New York, NY 10048
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, Inc., 1725 Jefferson Davis Highway, Suite 700, Arlington, VA 22202
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
Fleetweather Ocean Services, Inc., Rd. #2, Box 260, Hopewell Junction, NY 12533
Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, NY 11050
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., 610 Colman Bldg., 811 First Ave., Seattle, WA 98104
Phillip Gresser Associates, Ltd., 3250 South Ocean Blvd., Palm Beach, FL 33480
Morris Guralnick Associates, Inc., 620 Folsom Street, Suite 300, San Francisco, CA 94107
Hamilton Cornell Associates, Box 188, Snug Harbor Station, Duxbury, MA 02331
J.J. Henry Co., Inc., Two World Trade Center—Suite 9528, New York, NY 10048
Hi-Test Laboratories, Inc., P.O. Box 226, Buckingham C.H., VA 23921
Hoffman Maritime Consultants Inc., P.O. Box 186, Glen Head, NY 11545
HydroComp, Inc., 10 Cutts Road, P.O. Box 865, Durham, NH 03824
Intramarine, Inc., P.O. Box 53043, Jacksonville, FL 32201
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Jantzen Engineering Co., 6655-H Amberton Drive, Baltimore, MD 21227

J.L. Konopasek & Associates, 3523 Scrimshaw Dr., Jacksonville, FL 32217
James S. Krogen & Co., Inc., 3333 Rice St., Miami, FL 33133
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
John J. McMullen Associates, Inc., 1 World Trade Center, New York, NY 10048
McLear & Harris, Inc., 28 West 44 Street, New York, NY 10036
Fendall Marbury, 1933 Lincoln Drive, Annapolis, MD 21401
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, OH 44114
Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, NY 11746
Marine Power Associates, 4475 Mission Blvd., Suite 235, San Diego, CA 92109
Marine Technical Associates, Inc., 95 River Rd., Hoboken, NJ 07030
George E. Meese, 194 Acton Rd., Annapolis, MD 21403
R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003
NKF Engineering Assoc., Inc., 8150 Leesburg Pile, Vienna, VA 22202
Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
New England Engineering & Marine Services, Rt. 2, Box 50, York, ME 03909
Nickum & Spaulding Associates, Inc., 2701 First Ave., Seattle, WA 98121
Northern Marine, P.O. Box 1169, Traverse City, MI 49685
Ocean-Oil Internatinal Engineering Corporation, 3019 Mercedes Blvd., New Orleans, LA 70114
PRC Guralnick, 5252 Balboa Ave., San Diego, CA 92117
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, FL 33156
S.L. Petchul, Inc., 1380 S.W. 57th Avenue, Fort Lauderdale, FL 33317
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St., San Francisco, CA 94105
Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, FL 33316
SEACOR Systems Engineering Associates Corp., 19 Perina Blvd., Cherry Hill, NJ 08003 (Publications Division at Cherry Hill location)
STV/Sanders & Thomass, Inc., 1745 Jefferson Davis Hwy., Arlington, VA 22202
Seaworthy Engine Systems, 36 Main Street, Essex, CT 06426
Seaworthy Engine Systems, 17 Battery Place, New York, NY 10004
George G. Sharp, Inc., 100 Church St., New York, NY 10007
Simmons Associates, P.O. Box 760, Sarasota, FL 33578
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
J.F. Stroschein Associates, 666 Old Country Rd., Garden City, NY 11530
Richard R. Taubler, Inc., 610 Carriage La., Dover, DE 19901
Timsco, 622 Azalea Road, Mobile, AL 36609
Tracor Hydronautics, Inc., 7210 Pindell School Rd., Laurel, MD 20707
Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744

NAVIGATION & COMMUNICATIONS EQUIPMENT

American Hydromath Co., Buckwheat Bridge Rd., Germantown, NY 12526
Anschutz & Co., GmbH, Postfach 6040, D-2300 Kiel 14, West Germany
Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080
CMC Communications Inc., 5479 Jetport Industrial Blvd., Tampa, FL 33614
COMSAT World Systems, 950 L'Enfant Plaza, S.W., Suite 6151 Washington, DC 20024
Cybernet International, Inc., 7 Powder Horn Dr., Warren, NJ 07060
A/S Elektrisk Bureau, P.O. Box 98, N-1360 Nesbru, Norway
Electro-Nav Inc., 840 Bond Street, Elizabeth, NJ 07201
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
General Electric Company, Mobile Communications Division, Lynchburg, VA 24502
Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610
Henschel Corp., 9 Hoyt Drive, Newburyport, MA 01950
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
King Radio Corporation, 400 North Rodgers Rd., Olathe, KS 66062
Kongsberg North America Inc., 400 Oser Ave., Hauppauge, NY 11738
Kongsberg Vopenfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway
Krupp Atlas-Elektronik, 1453 Pinewood St., Rahway, NJ 07065
Lorain Electronics Corp., 2307 Leavitt Rd., Lorain, OH 44052
Magnum Distributors Inc., 1000 S. Dixie Hwy. #3, Pompano Beach, FL 33060
Micrologic, 20801 Dearborn, Chatsworth, CA 91311
Nav-Com, Inc., 9 Brandywine Drive, Deer Park, NY 11729
Navigation Sciences Inc., 6900 Wisconsin Ave., Bethesda, MD 20815 TX: 705999
Perko Inc. (Lights), P.O. Box 6400D, Miami, FL 33164
Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033
Raytheon Marine Co., 676 Island Pond Road, Manchester, NH 03103
Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061
Robertson Autopilot, 400 Oser Ave., Happauge, NY 11738
Servo Corporation of America, 111 New South Road, Hicksville, NY 11802
Simrad, Inc., 2208 N.W. Market St., Suite 600, Seattle, WA 98107
Sperry Corporation, Great Neck, NY 11020
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Texas Instruments, Inc., P.O. Box 405, 3438, Lewisville, TX 75067

OILS—Marine—Additives

Exxon Company, U.S.A., Room 2323 AH, P.O. Box 2180, Houston, TX 77701
Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001
Gulf Oil, New York District Sales Office (Domestic), 433 Hackensack Avenue, Hackensack, NJ 07601
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
Mobil Oil Corp., 150 East 42 Street, New York, NY 10017
Texaco, Inc. (International Marine), 135 East 42nd St., New York, NY 10017

OIL/WATER SEPARATORS

Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Biospherics Incorporated, 5001 Forbes Blvd., Lanham, MD 20801
Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223-9989
Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307
Hyde Products, Inc., 810 Sharon Dr., Westlake, OH 44148
Microphor, Inc., P.O. Box 490, Willits, CA 95490
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696

PAINTS—COATINGS—CORROSION CONTROL

American Abrasive Metals, 460 Coit Street, Irvington, NJ 07111
Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754
A.W. Chesterton Co., Middlesex Industrial Park, Rt. 93, Stoneham, MA 02180
Chugoku Marine Paints (U.S.A.) Inc., 1290 Ave. of Americas, New York, NY 10104
CLEMCO, P.O. Box 7680, San Francisco, CA 94120
"CONSOL" manufactured by Contact Paint & Chemical Co. Inc., 200 S. Franklintown Rd., Baltimore, MD 21223
Dampney Company, Inc., 85 Paris St., Everett, MA 02149
Devoe Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207
Drew Ameroid Marine, One Drew Chemical Plaza, Boonton, NJ 07005
E.I. DuPont De Nemours & Co., Inc. Nemours Bldg., Rm. N-2504-2, Wilmington, DE 19898
Eureka Chemical Company, 234 Lawrence Avenue, So. San Francisco, CA 94080
Glidden Coatings & Resins, Architectural & Maintenance, 925 Euclid Ave., Cleveland, OH 44115
Hempel Marine Paints, Inc., Foot of Currie Ave., Wallington, NJ 07057; 2425 Fountainview, Suite 340, Houston, TX 77057, P.O. Box 10265, New Orleans, LA 70181
International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083
Jotun Marine Coatings Inc., 840 Key Hwy., Baltimore, MD 21230
Magnus Maritec International Inc., 150 Roosevelt Pl., P.O. Box 150, Palisades Park, NJ 07650
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470
Palmer Products Inc., P.O. Box 8, Worcester, PA 19490
Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203
Selby, Battersby & Company, 5220 Whiby Avenue, Philadelphia, PA 19143
Sermatech International, 4401 SermeTel Dr., Moss Point, MS 39563

PIPE-HOSE—Cargo Transfer Clamps, Couplings, Coatings

Amermarine International, P.O. Box 9205, Dundalk, MD 21222
Crawford Fitting Company, 29500 Solon Rd., Solon, OH 44139
Hydro-Craft Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063
Knights Piping Inc., 5309 Industrial Rd., Pascagoula, MS 39567
Selkirk Metalbestos, Box 19000, Greensboro, NC 27419
Tioga Pipe Supply Co. Inc., 2450 Wheatsheaf La., P.O. Box 5997, Philadelphia, PA 19137

PLASTICS—Marine Applications

Hubeva Marine Plastic, Inc., 390 Hamilton Ave., Brooklyn, NY 11231
Norton Chemplast, 309-150 Dey Rd. Wayne NJ 07470

PLYWOOD

Simpson Timber Co., Third and Franklin, Sheton, WA 98584

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines

Aquamaster Inc., 4125, 9th Avenue N.W. Seattle, WA 98107
Armco Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
Bergen Diesel Inc., 2110-10 Service Rd., Kenner, LA 70062
Bird-Johnson Company, 110 Norfolk St., Walpole, MA 02081
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Capitol Gears, 349 N. Hamline Ave., St. Paul, MN 55104
Caterpillar 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
Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520
Combustion Engineering, Inc., Windsor, CT 06095
Daihatsu Diesel (USA) Inc., 180 Adams Ave., Hauppauge, NY 11788
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505
George Engine Company, Inc., Lafayette, LA
General Motors, Electro-Motive Division, LaGrange, IL 60525
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231
Isotta Fraschini S.p.A., c/o Italian Aerospace Industries (U.S.A.), Inc., 1235 Jefferson Davis Hwy., Suite 500, Arlington, VA 22202
KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada
KaMeWa, P.O. Box 1010, S-68101, Kristinehamn, Sweden
KaMeWa, 1800 West Loop So., Suite 1620, Houston, TX 77027
Krupp Mak Diesels, Inc., 4329-33 Di Paolo Center, Glenview, IL 60025
Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323
M.A.N.-B&W Diesel, 2 Ostervej, DK-4960 Holeby, Denmark
MTU of North America, One E. Putnam Ave., Greenwich, CT 06830; 10450 Corporate Dr., Sugarland, TX 77478; 2945 Railroad Ave., Morgan City, LA 70203; 180 Nickerson St., Seattle, WA 98109; 1730 Lynn St., Arlington, VA 22209
MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046
Mapeco Products, Inc., 20 Vesey St., New York, NY 10007
Maritime Industries Ltd., 6307 Laurel St., Burnaby, B.C., Canada V5B 3B3
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA 70037
North American Marine Jet P.O Box 1232 Benton, AR 72015
Omnithruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
Penske GM Power, Inc., 600 Parsippony Road, Parsippany, NJ 07054
Penske GM Power, Lodi N.J., 180 Rt. 17 South, Lodi, NJ 07644
Inland Water Propulsion Systems, Inc., 580 Walnut St., Cincinnati, OH 45201
Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032
SACM (Societe Alsacienne De Constructions Mechaniques De Mulhouse) 1, Rue De La Fonderie, Boite Postale 1210, 68054 Mulhouse Cedex, France
Schottel of America, Inc., 8375 N.W. 56 St., Miami, FL 33166
Karl Senner, Inc., P.O. Box 10055, New Orleans, LA 70181
Skinner Engine Company, P.O. Box 1149, Erie, PA 16512
Stewart & Stevenson Services, Inc., P.O. Box 1637, Houston, TX 77251-1637
Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland
Tech Development Inc., 6800 Poe Ave., P.O. Box 14557, Dayton, OH 45414
Transamerica DeLoval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621
Transamerica Delaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, NJ 08650
Ulstein Trading Ltd. A/S, N-6-65, Ulsteinvik, Norway
Voith Schneider America, 159 Great Neck Rd., Ste. 200, Great Neck, NY 11021
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
WABCO Fluid Power, an American-Standard Company, 1953 Mercer Rd., Lexington, KY 40505
Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072
Waukesha Engine Division, Waukesha, WI 53187

PUMPS—Repairs—Drives

Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
Ingersoll—Rand Pump Group, Dept. B—346, Washington, N.J. 07882
Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
Sims Pump Valve Co., Inc., 1314 Park Ave., Hoboken, NJ 07030
Transamerica Delaval, Pyramid Pump Div., P.O. Box 447, Monroe, NC 28110
Vita Motivator Company, 200 West 20th St., New York, NY 10011
Warren Pumps Division, Bridges Avenue, Warren, MA 01083
Wilden Pump & Engineering Co., 22060 Van Buren St., P.O. Box 845, Colton, CA 92324

REFRIGERATION—Refrigerant Valves

Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, NY 11231

ROPE—Manila—Nylon—Hawsers—Fibers

American Mfg. Co., Inc., Willow Avenue, Honesdale, PA 18431
Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008
DuPont Co., KEVLAR Aramid Fiber, Room G-15465, Wilmington, DE 19898
Samson Ocean Systems, Inc., 99 High Street, Boston, MA 02110
Tubbs Cordage Company, P.O. Box 709, Orange, CA 92666
Vermeire N.V. Industripark Zwoarveld, B-9160 Hamme, Belgium TX: 21687
Wall Industries, Inc., P.O. Box 560, Elkin, NC 28621

SANITATION DEVICES—Pollution Control

Davit Sales Inc., P.O. Box 232, Jefferson Valley, NY 10535
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
FAST Sewage Systems, Div. of St. Louis Ship, 611 East Marceau St., St. Louis, MO 63111
Golar Metal A/S, P.O. Box 70, 4901 Tvedestrand, Norway
Marine Moisture Control Co., Inc., 60 Inip Dr., Inwood, L.I., NY 11696
National Sanitation Foundation, P.O. Box 1468, Ann Arbor, MI 48105

SCAFFOLDING EQUIPMENT—Work Platforms

McCausey Lumber Co., 7751 Lyndon, Detroit, MI 48238
Trus-Joist Corp., P.O. Box 60, Boise, ID 83704

SCUTTLES/MANHOLES

Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

SHAFT SEALS, REVOLUTION INDICATOR EQUIPMENT

Bird-Johnson Co., 100 Norfolk St., Walpole, MA 02081
Crane Packing Company, 435 Regina Dr., Clarksberg, MD 20734
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470

SHIPBREAKING—Salvage

The Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Fred Devine Diving & Salvage, Inc., 6211 N. Ensign, Swan Island, Portland, OR 97217
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

SHIPBUILDING EQUIPMENT

Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, FL 33156
Total Transportation System Inc., 813 Forest Dr., Newport News, VA 23606
Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 248, N 5201, Os, Norway

SHIPBUILDING STEEL

Armco Steel Corp., 703 Curtis St., Middletown, OH 45042
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
United States Steel Corp., Christy Park Plant, 2214 Walnut St., McKeesport, PA 15132
Welded Beam Company, P.O. Box 280, Perry, OH 44081

SHIPBUILDING—Repairs, Maintenance, Drydocking

Advanced Technology, Dept. PZ-01, 7926 Jones Branch Dr., McLean, VA 22102
Amsterdam Drydock Company, Post Box 3006, 1003 AA, Amsterdam, Holland
Arsenale Triestino-San Marco Shipyard, Trieste, Italy, U.S. Rep: Marine Technologies & Brokerage, 33 Rector St., New York, NY 10066
Asmar Shipyards Co., Astilleros y Maestranzs de la Armada, Prat 856, Piso 14, Casilla 150-V, Valpariso, Chile, S.A.
Astilleros Balboa, S.a., c/o Jackson Marine Corp., 17 Battery Place, New York, NY 10004
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
Bath Iron Works Corp., 700 Washington St., Bath, ME 04530
Bender Shipbuilding & Repair Co., Inc., P.O. Box 42, Mobile, AL 36601
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
Burmeister & Wain Skibsvaerft A/S, P.O. Box 2122, Refshaleoen-1015 Copenhagen K-Denmark
Burrard Yarrows Corporation, P.O. Box 86099, North Vancouver, B.C., Canada
Cantieri Navali Riuniti, Via Cipro, 11, 16100 Geneva, Italy
Conrad Industries, P.O. Box 790, Morgan City, LA 70380
Curacao Drydock Company Inc., 26 Broadway, Suite 741, New York, NY 10040
Daewoo International (America) Corp., 437 Madison Ave., New York, NY 10022
Daewoo Shipbuilding & Heavy Machinery Ltd., Ayangri, Changsung-PO Koje-Kun, Kyungnam, Korea
Davie Shipbuilding Ltd., P.O. Box 130, Levis, Quebec, Canada G6V6N7
Dorbyl Ltd., Military Road, 1 Industrial Sites, West Bank, 5201 East London, Republic of South Africa
Dravo Marine Equipment Company, Neville Island, Pittsburgh, PA 15225
Dubai Drydocks, P.O. Box 8988, Dubai, United Arab Emirates—U.S.A. Agents: Keppel Marine Agencies, Inc., 26 Broadway, New York, NY 10040, 6240 Richmond Ave., Houston, TX 77057
Eastern Marine, Inc., P.O. Box 1009, Panama City, FL 32401
FMC Corp., Marine & Rail Equipment Div., 4700 N.W. Front Ave., Portland, OR 97208
Far East Levingston Shipbuilding Ltd., 31 Shipyard Rd., Jurong Town, Singapore 2262
Genstar Marine, 10 Pemberton Ave., No. Vancouver, B.C., Canada V7P 2R1
Gladding-Heorn Shipbuilding Corp., 1 Riverside Ave., Somerset, MA 02725
Golten Marine Co., Inc., 60 Van Brunt St., Brooklyn, NY 11231
HBC Barge, Inc., Grant Building, Pittsburgh, PA 15219
Halter Marine, Inc., P.O. Box 29266, New Orleans, LA 70189
Hitachi Zosen Corp., 1-1-1 Hitotsubashi, Chiyoda-ku, Tokyo 100, Japan
Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong
Hyundi Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, Korea
Jakobson Shipyard Inc., P.O. Box 329, Oyster Bay, NY 11771
Jeffboat Inc., Jeffersonville, Ind. 47130
Jered Brown Brothers, Inc., 56 S. Squirrel Rd., Auburn Hills, MI 48057
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
Kone Corp. P.O. Box 6 SF-05801 Hyvinkaa, Finland
Paul Lindenau GmbH, & Co., Schiffswerft u. Maschinenfabrik, D-2300 Kiel-Friedrichsort, West Germany
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
Main Iron Works, Inc., P.O. box 1918, Houma, LA 70361
Marinette Maine Corporation, Marinette, WI 54143
Mitsubishi Heavy Industries, Ltd., 5-1, Marunochi 2-chome, Chiyoda-ku, Toyko, 100 Japan
MonArk Boat Co., P.O. Box 210, Monticello, AR 71655
Moron Shipping Agencies, 602 Sawyer, Suite 200, Houston, TX 77077
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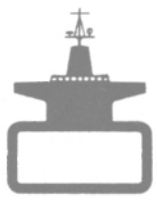

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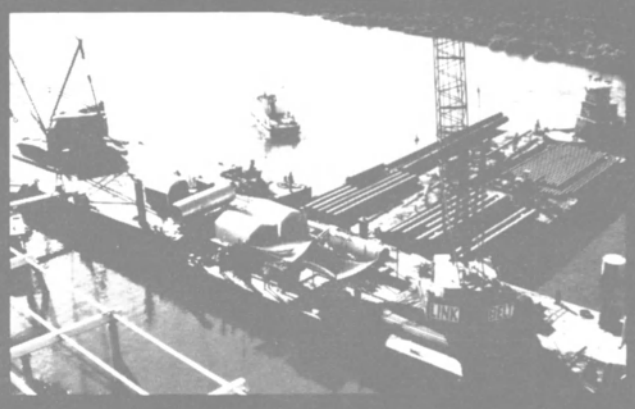

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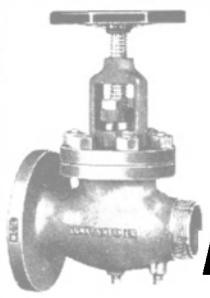

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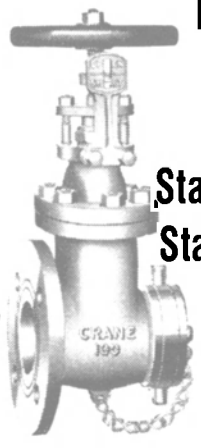

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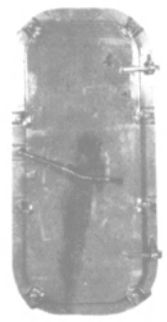

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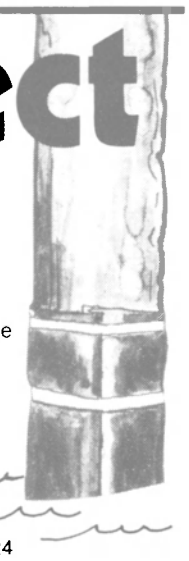

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Dillingham Maritime Delivers Building Modules To Valdez For Transport To North Slope

Dillingham Maritime recently delivered 124 building modules and support materials on three separate sailings from Seattle to the Port of Valdez, Alaska. The cargo was en route to Alaska's North Slope for the Conoco, Inc., Group Milne Point oil development project.

The delivery demonstrated the advantages of routing tug and barge shipments destined for the North Slope through the Port of Valdez. After arriving in Valdez, the cargo was trucked 920 miles to Milne Point, which is located 35 miles from Prudhoe Bay.

The modules were delivered to Valdez aboard 274- and 250-foot Foss barges, towed by the 2,900-hp tug Stacey Foss. Each module measured up to 60 feet long, 14 feet wide and 11 feet 10 inches high. The modules, manufactured by Olympic in Boise, Idaho, were trucked to Seattle's Foss Terminal for loading on barges for the journey to Valdez.

The modules were loaded aboard the barges by the Foss 300, a 75-ton-capacity steam crane which provided the precise positioning necessary to stack the long units two high.

The first oil from Milne Point is expected to be received at the Trans-Alaska Pipeline Marine Terminal in Valdez in early 1986.

Dillingham Maritime maintains a U.S.-flag fleet of some 100 tugs and more than 100 barges, and serves major ocean transportation markets including the U.S. West Coast, Alaska, Hawaii, the Pacific, the Gulf of Mexico and Central and South America.

ASEA Hagglunds Establishes New Division For Marketing Cargo Cranes In The U.S.

ASEA Hagglunds Inc., Houston, Texas, has established a new division for the marketing of Hagglunds cargo cranes in the United States. The transfer of these responsibilities from ASEA Stal to ASEA Hagglunds became effective September 1984.

The new marine division will be directed by **John A. Albino,** executive vice president and 19-year veteran of the company. Mr. **Albino** will direct the division from ASEA's Yonkers, N.Y. facility. His responsibilities will be to further strengthen the company's position in the marine and offshore industry with the utilization of existing and recently acquired products.

Claes G. Spens, president of ASEA Hagglunds, has stated that the marine and offshore division has been added as part of the corporate plan to bring all Hagglunds products under one organization. These products include Hagglunds hydraulic drives, specialized transportation equipment, deck cranes and offshore equipment.

ASEA Hagglunds has supported the U.S. maritime industry for 14 years with U.S. manufactured goods, centralized service, parts and operator training.

ASEA Hagglunds is a division of ASEA, Inc., the U.S. subsidiary of the worldwide ASEA Group. ASEA designs, manufactures and markets hydraulic, electronic, electrical, metallurgical and robotic equipment and systems for the transportation, marine, utility, pulp and paper, chemical, metal, mining and industrial markets.

For further information on ASEA Hagglunds,

Circle **34** on Reader Service Card

Southwest Marine Awarded Two Contracts Worth $2.8-Million

Southwest Marine, San Pedro Division, has been awarded a $1.24-million contract by the Military Sealift Command, Pacific, for the drydocking and lay-up of the USNS Comet.

The 449-foot-long Comet, a T-AKR with a gross tonnage of 13,793 tons, will be in dry dock for approximately 15 days for work on the hull, sea valves and the shafting.

Following drydocking and some post dock work, the Comet, which is being transferred from active to inactive status, will be prepared by Southwest Marine for lay-up with MarAd.

The contract on the Shoshone, valued at $1.6 million dollars, is for drydocking, a complete paint job and maintenance work on valves, piping and pumps.

The Shoshone, a 659-foot tanker, is owned and operated by the Maritime Administration, U.S. Department of Commerce.

Videoteleconferencing Systems To Be Built By COMSAT General

COMSAT General Corporation recently announced that it has been selected by the Naval Underwater Systems Center (NUSC) to construct three modular full-motion color videoteleconferencing systems. The systems will link the Naval Sea Systems Command headquarters, located in Arlington, Va., with research laboratories operated by NUSC in Newport, R.I., and New London, Conn. Total value of the contract to COMSAT General is $2.9 million.

Full implementation and operation of NUSC's videoteleconferencing system is expected by mid-1985. Part of a demonstration project being conducted by the Navy Laboratories Technical Office Automation and communication System (NALTOACS), the new system will improve NUSC's ability to communicate between dispersed groups working on common programs. The network will allow simultaneous transmission and reception of voice, full-motion video, still graphics and data.

Commenting on the contract award, COMSAT general president **Robert W. Kinzie** said: "The Navy is moving rapidly into the realm of advanced telecommunications capabilities, seeking more efficient and productive use of labor, enhancement of meetings through greater participation and, cost savings in time, travel and money. The teleconferencing rooms now being built for NUSC by COMSAT General are a major component of realizing those goals."

For additional information and free literature on COMSAT's videoteleconferencing systems,

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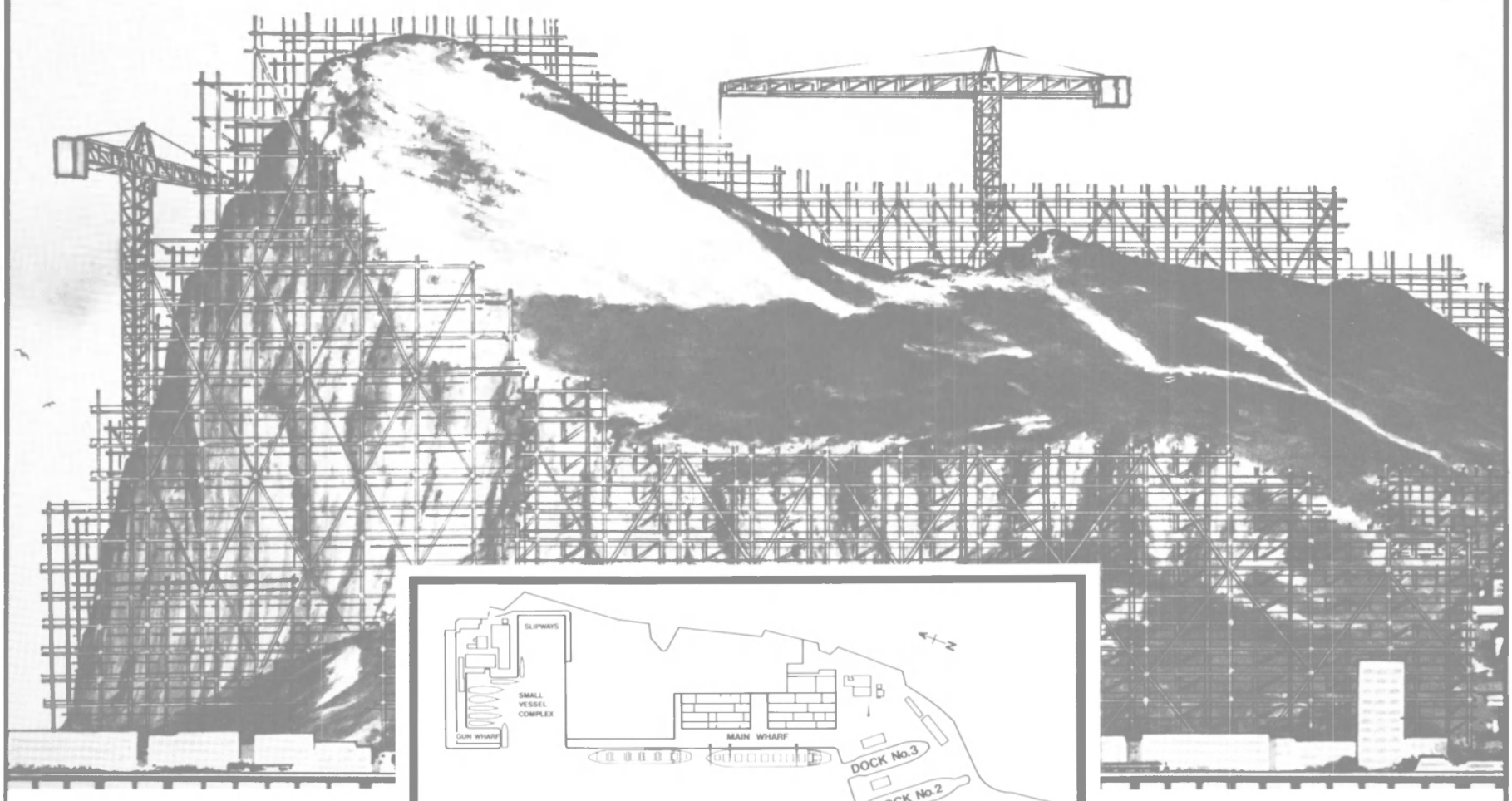
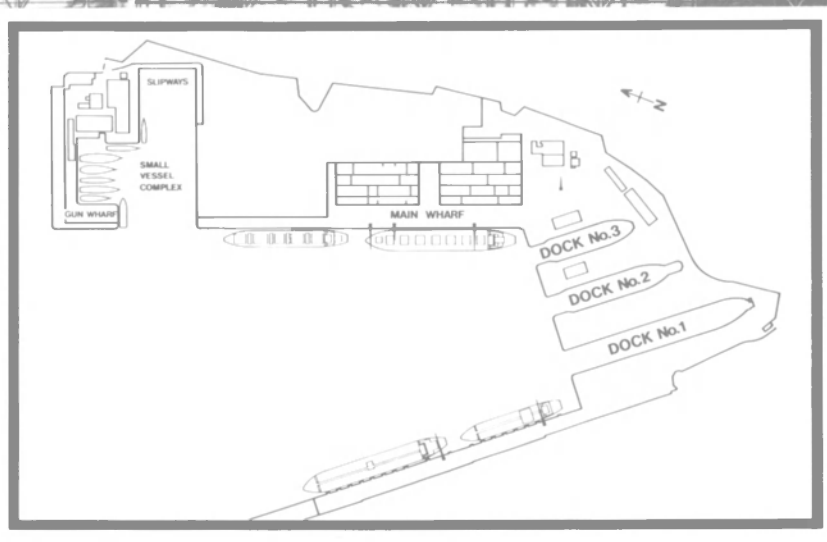
Circle 321 on Reader Service Card

Before the Rock's ready for ship repairs we're having to repair the Rock





The Rock is having its biggest facelift since the turn of the century. At a cost of £28 million, Gibraltar's former Royal Dockyard is being turned into a commercial repair yard for ships up to Panamax size.

Gibraltar has the location, at the crossroads of the world.

It will have the equipment – 7 new cranes, slop barge, re-fitted shops, full mechanisation. It has the workforce: Admiralty-trained, with the will and the incentive to succeed.

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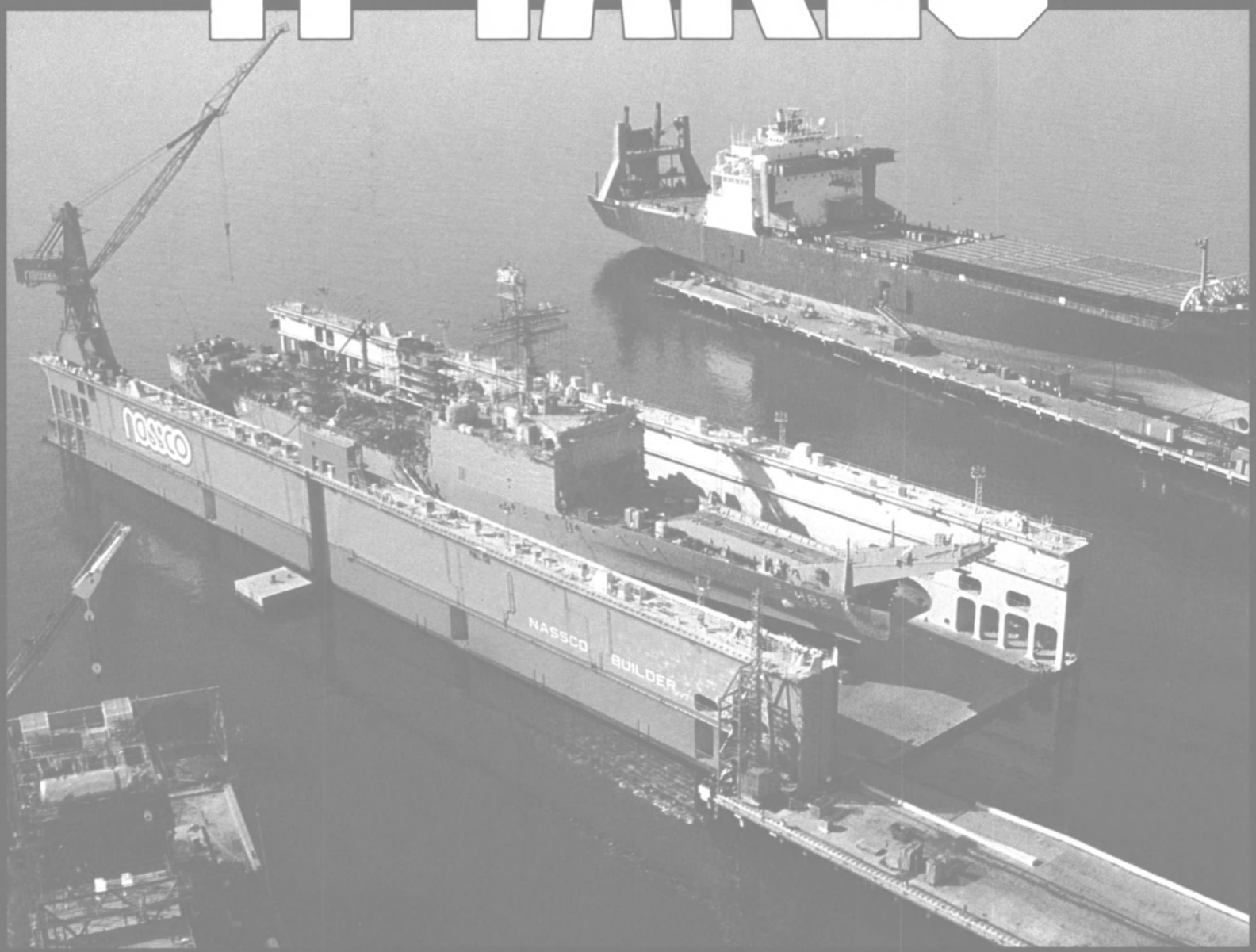
WHATEVER IT TAKES



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