MARITIME REPORTER
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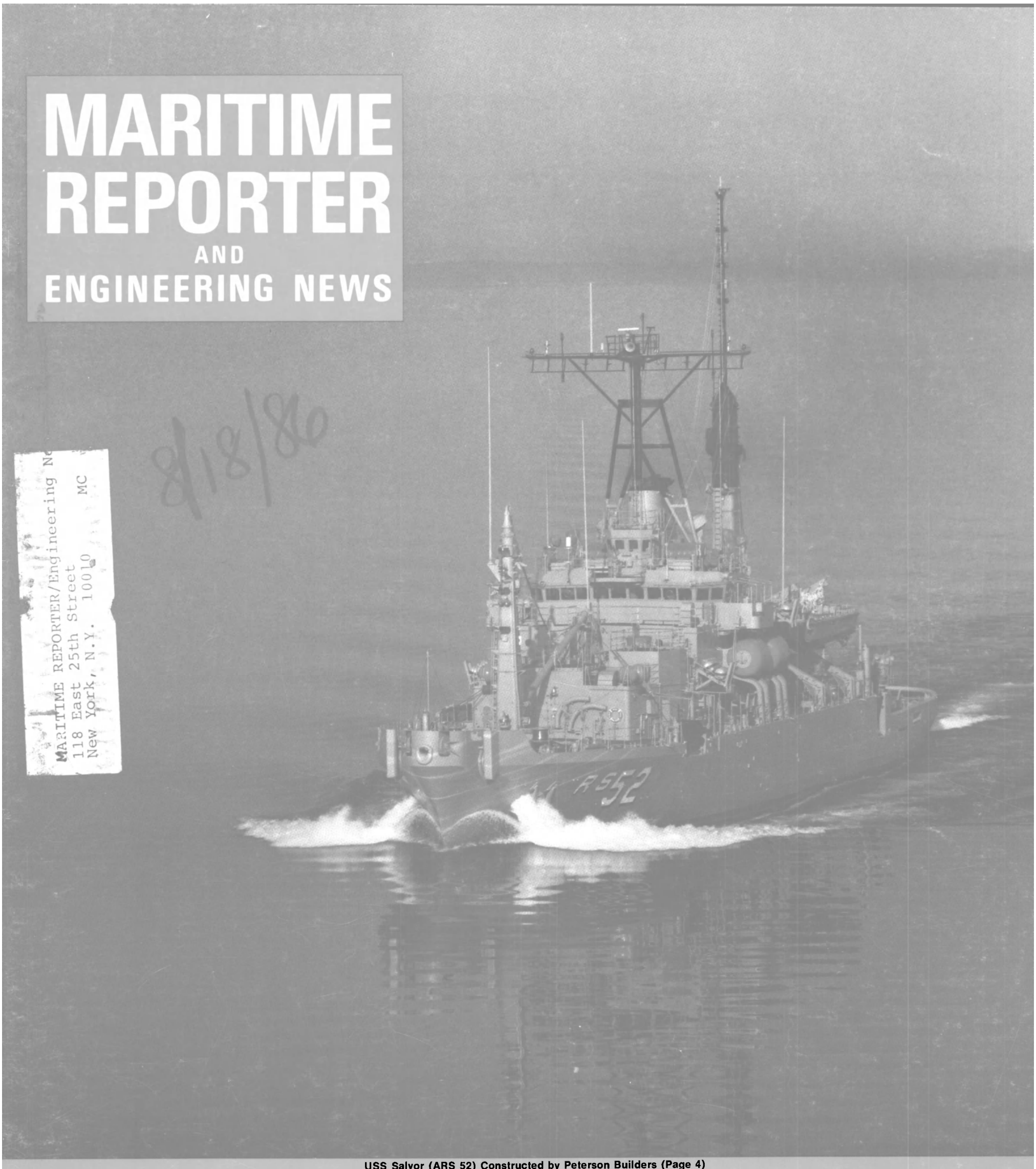
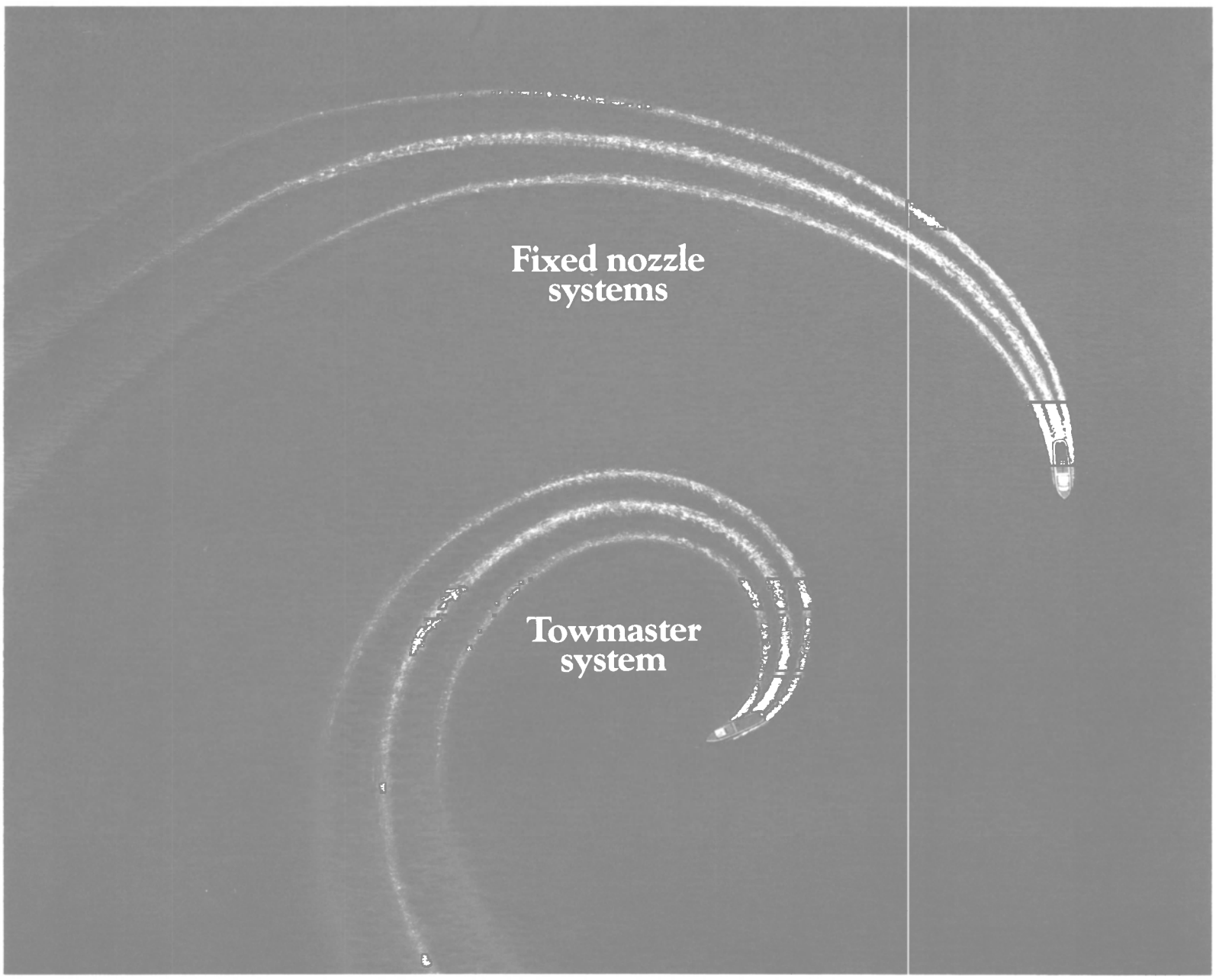


USS Salvor (ARS 52) Constructed by Peterson Builders (Page 4)

NOR-FISHING • OFFSHORE NORTHERN SEAS

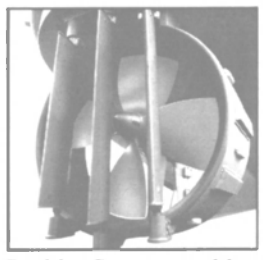
U.S. PORTS ANNUAL

AUGUST 1986 ISSUE



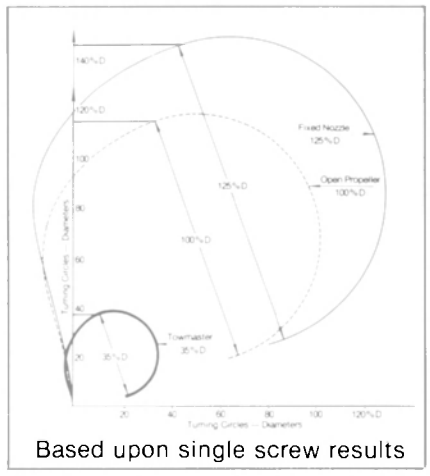
The Towmaster™ Nozzle/Rudder System can cut your turning circle by 70%

If your vessel has a ducted propeller system, Michigan Wheel's Towmaster Nozzle/Rudder System can give you a dramatic improvement in maneuverability and turning efficiency. In fact, if your vessel presently has a fixed nozzle system, tests prove the Towmaster Nozzle/Rudder System could reduce your turning circle by 70%. If yours is an open propeller system, you can expect an improvement of up to 60%.



The Towmaster can give you this kind of performance because of its unique triple-rudder design. Each rudder, by itself, produces a higher lift-to-drag ratio than conventional centerline rudders.

Turning diameter test results



Based upon single screw results

Together, they create a cascade effect that can allow 60° helm angles before rudder stall occurs.

And because the Towmaster also reduces rudder torque and makes more efficient use of propeller thrust, vessel operation is easier and less fatiguing.

The Michigan Wheel Towmaster Nozzle/Rudder System. It's proven its ability to increase maneuverability and overall operating efficiency in over 100 applications. To learn how it can do the same for you, contact Michigan Wheel for complete facts and the name of the distributor nearest to you.

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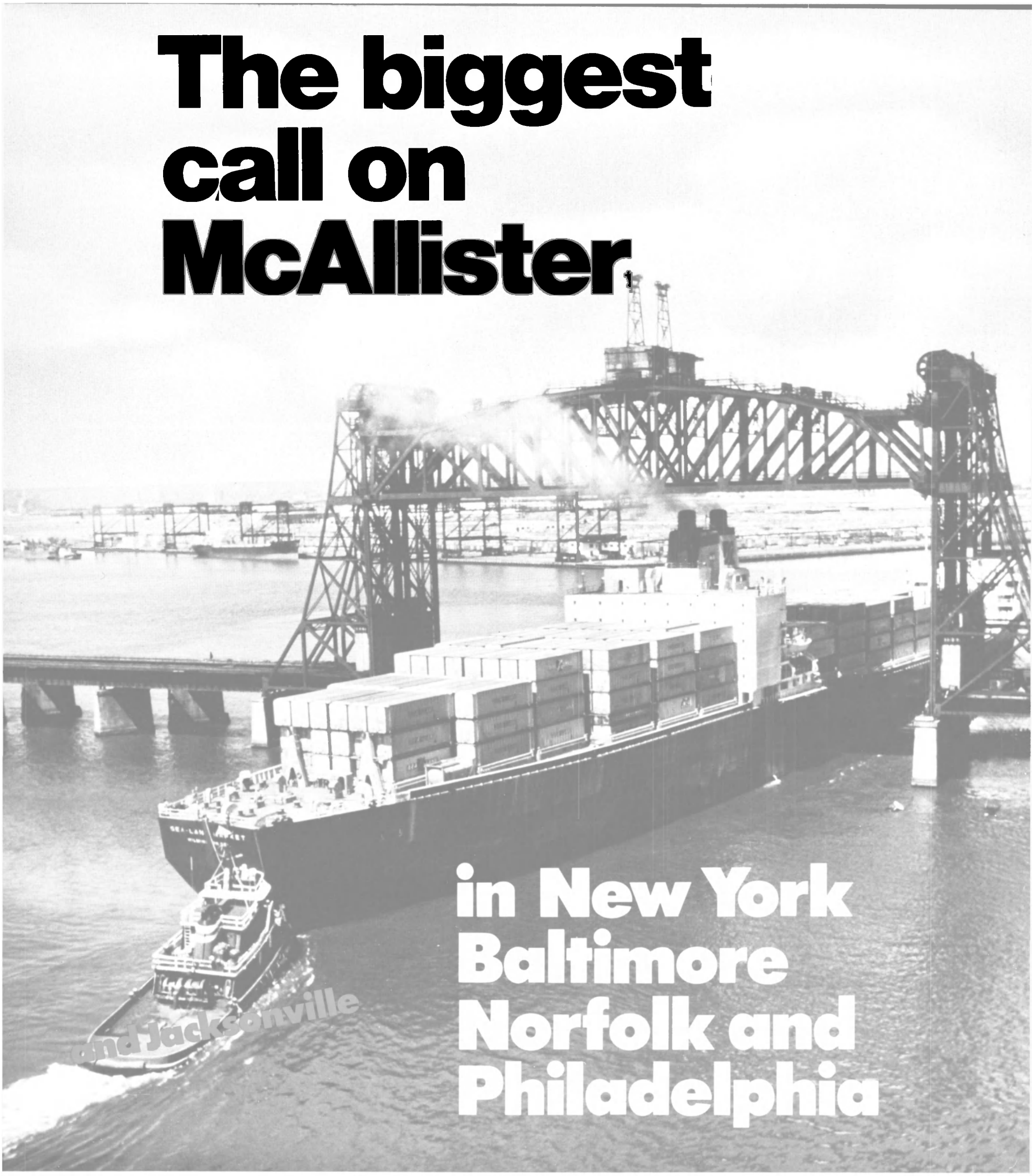
The biggest call on McAllister



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ON THE COVER

MacGregor-Navire Announces Key Appointments

The International MacGregor-Navire Organisation, recognized leaders in the design and supply of marine cargo access and port equipment, recently announced the appointment of **Ulf Hedberg** as president, and **Barry E. Gilmour** as executive vice president of its worldwide group of companies.

Mr. **Hedberg** is well-known in Scandinavian shipping circles and has been promoted from his previous position as managing director of the Finnish Group. He brings to the position 18 years of experience within the MacGregor-Navire Organisation. Mr. **Gilmour** was previously managing director of the MacGregor-Navire (UK) Group of companies and, prior to this, held senior positions in shipping and industry.

In line with its development and diversification policy, MacGregor-Navire has also formed a new Far East Division within its existing organizational structure, and recently announed the appointment of **Goran Johansson** as the divisional managing director. The new division will strengthen MacGregor-Navire's Far Eastern activities, thereby ensuring that the group's customers and business interests in that important market area are effectively served.

For more information on MacGregor-Navire,

Circle 20 on Reader Service Card

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Editorial and Executive Offices
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Publishers: JOHN E. O'MALLEY, CHARLES P. O'MALLEY
Editorial Director: CHARLES P. O'MALLEY
Editor: ROBERT WARE
Senior Editor: THOMAS H. PHILLIPS
Associate Editor: JOHN SNYDER
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Advertising Circulation and Sales Offices
118 East 25th Street, New York, NY 10010
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REPRESENTATIVES

Holland — MR. TONY KENTER
Kenter & Co.
P.O. Box 130, 7470 AC Goor, Holland
Telephone: 05470-5005
Telex: 72028

Italy — MR. VITTORIO F. NEGRONE
Ediconsult Internazionale
Piazza Fontane Marose, 3-16123 Genova, Italy
Telephone: (010) 543.659-268.334-268.513
Telex: 211197 EDINT I

Scandinavia — MR. STEPHAN R. G. ORN
AB Stephan R. G. Orn
Box 184, S-271 00 Ystad, Sweden
Telephone 0411-184 00
Telex: 33335 Orn S

West Germany — MR. WOLF O. STORCK
Schiffahrtswerbung Karl-Otto Storck
Stahlwiete 7, 2000 Hamburg 50,
Federal Republic of Germany
Telephone 040/850 0071

United Kingdom — MR. MICHAEL J. DAMSELL
Euromedia, Ltd.
P.O. Box 122, Haywards Heath
West Sussex RH16 1YF, England
Telephone: 0444-416845

Korea — MR. CHRIS MAENG
IPR Int'l PR, INC.
Yongsan
P.O. Box 100
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Telephone: 273-7765
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Japan — MR. TOSHIO EGUSA
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21-7, Hakusan, Bunkyo-ku, Tokyo 112 Japan
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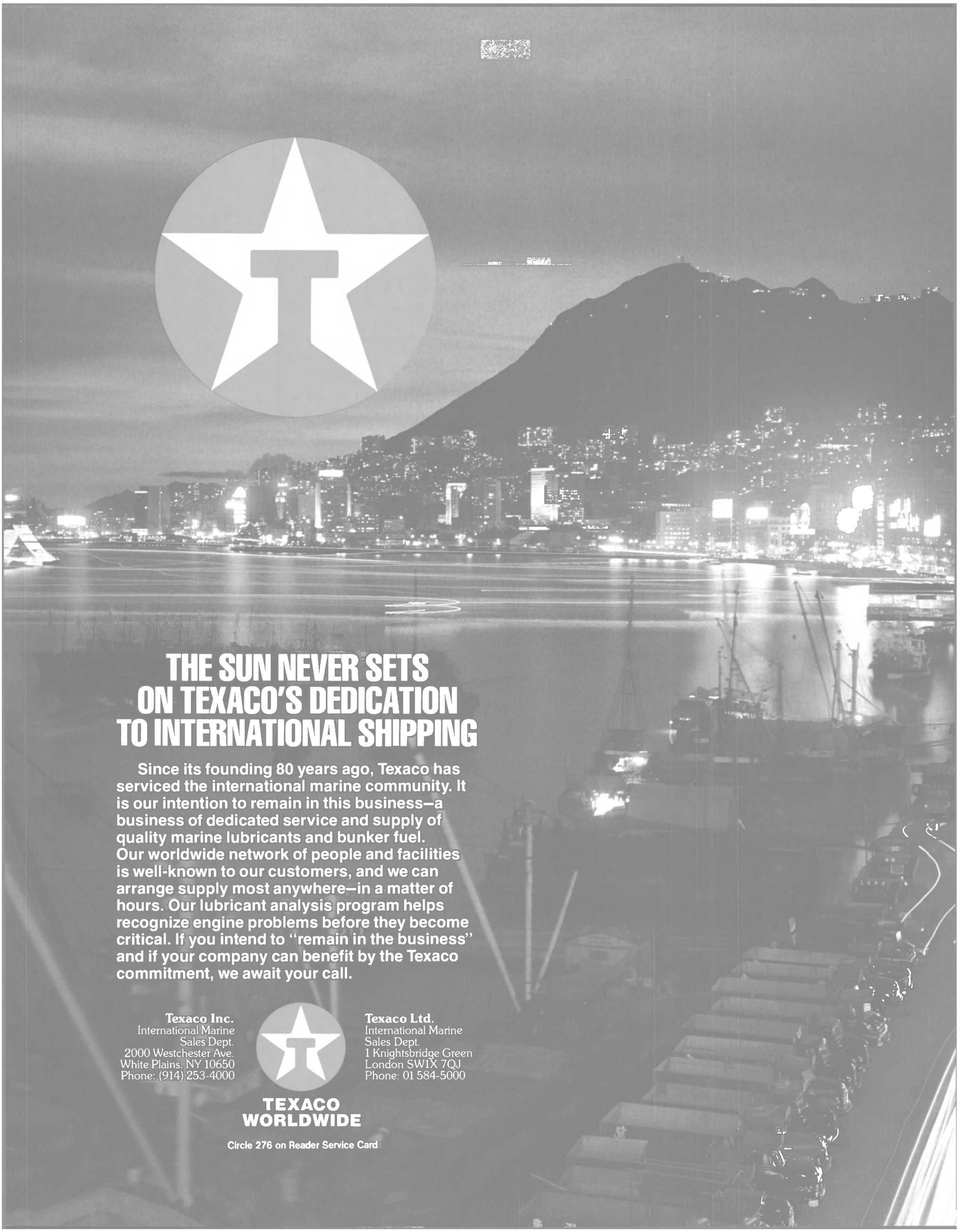

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TEXACO WORLDWIDE

Circle 276 on Reader Service Card

Francis J. Barry

Francis J. (Frank) Barry, 79 founder of the Circle Line boat tours around Manhattan, died last month at Memorial Sloan-Kettering Cancer Center in New York City.

Mr. **Barry,** who described himself as a self-made man, played a leading role in the development of the Port of New York for more than 40 years. Born in Manhattan's Hell's Kitchen, he founded Circle Line Sightseeing Yachts Inc. in 1945, and was board chairman at his death. He was also owner and president of Circle Line-Statue of Liberty Inc. and chairman of Hudson River Day Lines, a 164-year-old company he bought in 1962.

New Repair Yard Under Construction In Southern Chile For ASMAR & Partner

A new shipyard now under construction at Punta Arenas on the most southern tip of Chile is scheduled to begin repair operations in November this year. Named Astillero Estrecho de Magallanes Ltda., the new yard is a joint venture of Chilean shipbuilder and repairer, ASMAR, and Sandock-Austral of South Africa.

The yard is being equipped with a 4,000-ton lifting capacity marine railway designed by Crandall Dry Dock Engineers, Inc. of Dedham, Mass. The railway will be able to accommodate vessels of up to 426 feet in overall length, 78.7 feet in beam, and having a draft of up to 19.7 feet.

Since 1960, ASMAR has had a shipyard facility at Punta Arenas that has a slipway with a maximum lifting capacity of 1,000 tons, limiting drydocking to smaller vessels only. Repairs to larger vessels have been carried out afloat, and many merchant ships, icebreakers, supply vessels, and jackup rigs have been repaired by ASMAR in Punta Arenas.

When both yards are in operation, the Port of Punta Arenas will be able to offer almost any repair service, thereby enabling owners to avoid the 8-10 days of costly sailing to the next closest repair yard.

Yamazaki New President Of Sumitomo Machinery

Nick Yamazaki

Nick Yamazaki, formerly vice president and chief operating officer of Sumitomo Machinery Corp. of America, Teterboro, N.J., has been promoted to president and chief executive officer.

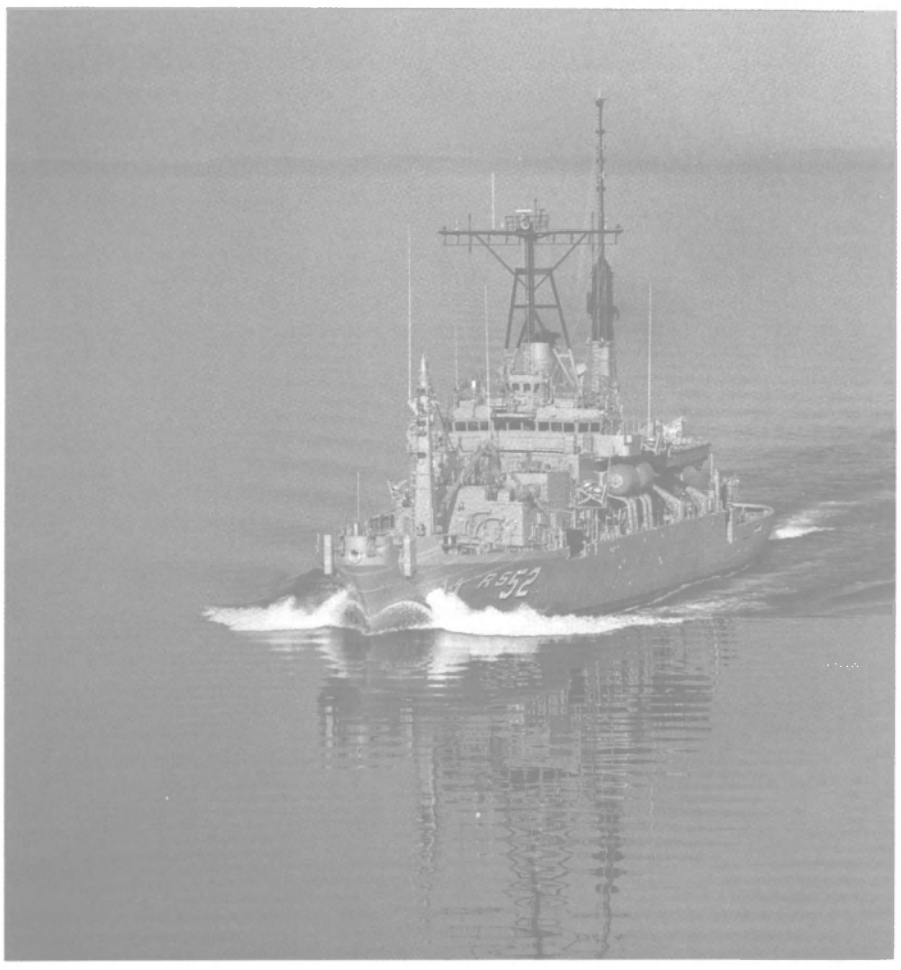
Mr. **Yamazaki** replaces **Takashi Fuji**, Sumitomo Machinery president for the past two years, who has been promoted to general manager, planning department, Power Transmission Group, of Sumitomo Machinery's parent company, Sumitomo Heavy Industries, Ltd., Tokyo, Japan.

Sumitomo Machinery is North America's fastest-growing supplier of industrial power transmission products, including mechanical, speed reducers, and mechanical and electrical adjustable-speed drives.

During the past year, the company doubled its North America sales of these products. During the same period, Sumitomo Machinery greatly expanded its North American stocking and assembly capacity, and introduced 15 new product lines.

As Sumitomo Machinery president, Mr. **Yamazaki** plans to accelerate the company's already fast growth rate and to continue to increase the number of the company's power transmission product lines.

ON THE COVER



Auxiliary Rescue Salvage Vessel Commissioned At Peterson Shipyard

Several hundred people gathered at the Sturgeon Bay, Wisc., shipyard of Peterson Builders, Inc. (PBI) recently for the commissioning ceremonies of the USS Salvor (ARS-52), one of the most versatile support ships in the U.S. fleet. She is the third of four vessels of this class contracted to PBI by the Navy.

The ship's new commanding officer, Lt. Cdr. **Robert A. Reish,** USN, assumed command in response to the commissioning directive read by Comdr. **John R. Drucker,** USN, Commander of Service Squadron Five. Principal speaker at the ceremony was Vice Adm. **Robert L. Walters,** USN (Ret.). Other speakers on the occasion were **Ellsworth L. Peterson,** president of PBI; Rear Adm. **Harry K. Fiske,** USN, Assistant Deputy Commander for Surface Ships Logistics Management; and Capt. **Thomas J. Kile,** USN, Supervisor of Shipbuilding, Conversion and Repair at Sturgeon Bay. Mrs. **Diana Walters,** sponsor of the ship at her christening 33 months earlier, was also in attendance.

In addition to being equipped with a recompression chamber to treat diving-related accidents, this new class of salvage ship will replace an older class of rescue vessels with state-of-the-art lift, towing, and diving equipment. The ARS-50 Class has an overall length of 255 feet, beam of 51 feet, draft of 16 feet 7 inches, and displacement of about 3,200 long tons. The Salvor carries a crew of six officers and 85 enlisted personnel; as a non-combatant support vessel, both men and women are eligible to serve in the crew.

Main propulsion is provided by four Caterpillar diesels, each with an output of 1,200 bhp, driving two Bird-Johnson controllable-pitch propellers via GEC reduction gears. A Brunvoll bow thruster provides enhanced maneuverability. Service speed is 14.5 knots.

The Salvor is equipped with a Raytheon SPS-64 navigational radar fitted with a computerized collision-avoidance system. This unit automatically tracks up to 20 separate surface targets up to a range of 48 miles, giving true course and speed, closest point of approach for each contact, and warns the watch if any ship will pass closer than desired.

Installed on the signal bridge directly below the mast are two 19-inch Xenon searchlights that can be trained and focussed remotely from the pilothouse. Four fire monitors are located fore and aft on the signal bridge, on the forward kingpost, and on the forecastle for off-the-ship firefighting. Each monitor is capable of pumping 1,000 gallons of water or foam per minute. The monitor on the kingpost is remotely controlled from the signal bridge.

Aft of the superstructure is a 40-ton boom that can be operated from a chest harness control unit, allowing the operator to be positioned anywhere from the port or starboard bulwark. This boom provides the capability for loading/offloading, moving onboard equipment, striking below and breaking out salvage equipment, plumbing the hold of a disabled vessel to increase its buoyancy, and launching/recovering boats. A 7½-ton boom on the forecastle has similar capabilities.

Retractable tow rollers are installed on the fantail to restrain the sweep of the twin 3,000-foot, 2¼-inch wire towing hawsers when raised. When rotated to the retracted position, the rollers are clear of the hawsers' sweep. This ship is capable of towing alone an aircraft carrier of the Nimitz Class at a speed of five knots.

Ships of the ARS class carry a complement of divers to perform underwater ship's husbandry and salvage operations, as well as underwater search and recovery. The diving equipment is the MK-12, a technologically advanced replacement for the copper MK-5 deepsea diver's equipment, which has recently been retired from service. The advanced diving gear allows divers to descend to a depth of 190 feet.

Built to assist ships in peril on the high seas, the Salvor's mission is fourfold. In addition to assisting disabled vessels, she is designed to fight fires alongside other ships, recover submerged objects, and perform manned diving operations. Her sturdy steel construction combined with speed and endurance make the ARS Class ships well suited for rescue and salvage operations around the world.

For additional information on the facilities and capabilities of Peterson Builders,

Circle 64 on Reader Service Card

USS SALVOR
Major Suppliers

Main engines (4)	Caterpillar
Reduction gears (2)	GEC of England
Propellers (2)	Bird-Johnson
Bow thruster	Brunvoll
Generators (3)	Caterpillar/GE
Boilers	Cyclotherm
Switchboards	Nelson Electric
Ship control system	Henschel
Machinery control system	Eldec
Steering system	Paul Munroe
Windlass/capstans	New England Trawler
Anchors/chain	Baldt
Radars	Raytheon
Cathodic protection	Engelhard

NOR-FISHING '86

Trondheim, Norway, August 11-16

Nor-Fishing '86, the 11th International Fishery Fair to be held in Trondheim, Norway, August 11-16, has been fully booked, with the Nidaro Exhibition Hall filled to its maximum capacity, despite a space increase of 30 percent over 1984. Thus, this year's Nor-Fishing exhibition will be the biggest ever held.

Approximately 260 exhibitors from 15 countries will be showing the products and services of about 400 manufacturers from 20 countries. The countries represented by exhibitors are Austria, Denmark, East Germany, Finland, Great Britain, Iceland, Italy, Netherlands, Norway, Poland, Portugal, Spain, Sweden, United States, and West Germany.

It is expected that Norway's new Ministry of Fisheries, **Bjarne Mork Eidem,** will open the fair, which has been organized by the Royal Norwegian Ministry of Fisheries/Directorate of Fisheries, in cooperation with the Norwegian Trade Fair Foundation.

Through the years, Nor-Fishing has gained a reputation as one of the world's leading fishery fairs, with a pronounced international profile. Among the exhibitors, there is a particularly large contingent from the Nordic countries; prominent among these is Denmark with a national joint stand for 16 exhibitors.

Nor-Fishing attracts expertise from every corner of the world; for the six days in August, it will be the hub of international fishery activities. This applies particularly to the concurrent seminars, which in 1984 attracted delegates from 17 countries. The principal themes for this year's seminars are biotechnology applied to the utilization of marine resources, and the potential for minced fish and fish meal. In 1984, Nor-Fishing was visited by nearly 23,000 fishery specialists from 40 countries.

High-Technology Equipment

Over the years, the world fishery industry has learned to make full and efficient use of technological advances. This year, Nor-Fishing will introduce a wide range of new technology, particularly electronic innovations in the fields of weighing, reception systems, filleting and packaging, refrigeration, and deep-freezing. Advanced navigation equipment, communications and warning systems, automated equipment for trawlers, and the world's biggest trawl door will be on view at the fair. New equipment for fish farming and lifesaving will also be exhibited.

The organizers have endeavored as far as possible to group exhibitors by products. For example, the whole of Hall **E** in the Nidaro complex is devoted to maritime electronics, and most exhibitors of engines, fish processing, and refrigeration have been grouped in Hall F. An extensive range of fishing gear and equipment will be on display, and the packaging, transport, and storage side are also represented. Other exhibitors include shipyards, boatbuilders, and manufacturers of deck equipment, cranes and fittings, accommodations, cleaning services, etc.

Topical Seminars

As in previous years, the seminars will occupy two days, August 13-14, concurrent with the exhibition. This year the focus will be on processing technology, a topic that has been given much attention lately, involving both research and industrial aspects.

The seminar committee, headed by chairman **Ole Johan Ostvedt,** head of research at the Norwegian Fisheries Directorate Marine Research Institute, will again bring the world's foremost fishery expertise to Trondheim. Responsible for the seminars are the organizers of Nor-Fishing '86—the Royal Norwegian Ministry of Fisheries/Directorate of Fisheries, in cooperation with the Norwegian Trade Fair Foundation.

The first day of the seminar, Wednesday August 13, will be devoted to biotechnology, and will be chaired by Prof. **Jan Raa** of the University of Tromso. This session will discuss potentials and methods for the utilization of marine resources. Research within biotechnology opens significant perspectives for the Norwegian fishing industry. This applies particularly to the processing sector, which can lead to the rapid development of completely new fish products. Furthermore, valuable biochemicals aimed at entirely different markets other than the traditional ones can be obtained from fish—processes that may very well lead to a complete readjustment within the Norwegian processing industry.

The seminar will be opened by Prof. **Viggo Mohr** of the Institute for Biotechnology, Norwegian Institute of Technology in Trondheim. He will be followed by research director **Eirik Nestaas** from the U.S., who will discuss the competitive situation and perspectives in relation to biochemicals obtained from marine raw materials.

Then **Karl A. Almas** of the Institute of Fishery Technology Research in Tromso will cover the production of biochemicals from fish and fish oil. Finally, biotechnology and the herring meal industry will be discussed by Dr. **Agnar Mjelde** and director **Nils Urdahl,** both of the Herring Oil and Herring Meal Industry Research Institute in Bergen.

The August 14 session will be chaired by secretary general **Finn Bergesen Jr.** of the Norwegian Fishermen's Association. The subject of the day will be product development and marketing of minced fish and fish meal. Increased costs and competition from other food and feed products have lead to increasingly stringent demands on the fishing industry for the more efficient use of fish. Research in fisheries technology on the development of new products from minced fish and fish meal is therefore given high priority.

The session will begin with director **Ole Enger** of Norsildmel in Bergen, who will focus on foodstuff opportunities for the fish meal and fish oil industry. Traditional products for minced fish will be covered by **Jette Nielsen** of the Danish Ministry of Fisheries Research Laboratory in Lyngby.

New surimi-based products from minced fish will be covered by **Ragni Ofstad** of the Institute of Fisheries Technology in Tromso. The last presentation of the day will be given by research director **Johannes Opstvedt** and researcher **Eyolf Langmyhr** of the Herring Oil and Herring Meal Industry's Research Institute in Bergen.

Both seminars will allow an hour's panel discussion at the end of each day. Due to the wide international attention given to the Nor-Fishing seminars, there will be simultaneous translation into English. During the previous seminars in 1984, 17 different nations were represented on the list of delegates. The organizers are estimating the number of delegates to be in the range of 300-400 this year.

NOR-FISHING EXHIBITORS

Company	Stand No.
Aas Skipsbyggeri	A-17
Aco Nord Norge	B-110
Akerlund & Rausing	D-312
Alfa Laval Zeta	F-529
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Ramstad Eskefabrikk	D-314
Ranheim Papirfabrikk	D-332
Rapp Hydema	F-569
Rapp Hydema Syd	U-646
Redningsselskapet, NSSR	B-3
Refa Fiskeredskap	A-5
Rena Kartonfabrik	D-319
Rishaug Maskin	D-330
Robertson Tritech	E-407
Saba Molnlycke, Storforbruker	D-304
Sabb Motor	U-639
Sarpsborg Papp, Div. Kartong	D-332
Scanmar	E-412
Scanmarin	C-215
Scanvekt-Avery	D-309
Sea-Tek	F-539
Seatronic	C-201
Seljesth M.V.	U-620
Selo-Gjerstrup	F-553
Selsbakk Fabrikker	U-628
Selstad, Brdr.	A-10
Semi-Stal	D-316
Setsaas Avd. Rengjoringsteknikk	U-634
Shiptronics	E-405
Siemens	E-409
Sigbjorn Iversen	A-17
Sigma Elektroteknisk	D-313
Sildemelnaeringens Info. tjeneste	B-107
Simonsen & Eek	D-315
Simonsen Elektro	F-509
Simrad Subsea	E-414
Sjofartsdirektoratet	B-4A
Sjoforsvaret/Kystvaken	B-2
Skanti Radio	E-402
Skipsrevyen	B-101
Solhaug, O.S.	E-408
Solstrand Slip & Batbyggeri	A-17
Sperry Aerospace Marine Group	B-106
Spray Service	U-613
Stal Kulde	F-558
Stangebye-Hansens	C-218
Steen, Bertel O.	F-559
Stord Bratz	F-554
Stranda Motorverksted	F-510
Strandeberg, Arne	D-318
Straumplast	D-317
Strom, Leif H.	C-213
Stromberg, Per S.	D-316
Sunnmorsbanken	B-108
Syberg Agenturer	E-406
Som og Presse Teknikk	E-541
Soviknes Verft	A-17
Teknisk Industrieservice	F-564
Teknotherm	F-512
Telaeg Aksjeselskap	E-404
Tenfjord M.V.	F-508
Tico Norge	U-607
Tronderverftet	U-623
Ulstein Trading	F-514
Univern	B-105A
Universal Diesel	F-532
Upab; Ulo Produkter	F-572
Vaagland Batbyggeri	A-17
Vaagland M.V.	U-627
Vakuum-Service	D-321
Valmet	F-571
Vega Vekt	F-552
Vestlandske Fartyrbyggjarlag	A-17
Vestre	A-11
Vik & Sandvik	F-547
Viksund Nor	U-617
Volvo Norge, Avd. Volvo Penta	F-523
Wartsila Diesel	F-549
Veiberg Gullisken, J.	F-543
Wenaas Konfeksjonsfabrikk	F-518
West Mekan	U-636
Wichmann	F-535
Wright & McGill	A-20

McDermott Shipyard Lays Dredge Keel

Officials of McDermott Shipyard and American Dredging Company of Camden, N.J., recently celebrated the keel-laying for a 294-foot, self-propelled, diesel-electric, split-hull hopper dredge at McDermott's Morgan City, La., yard.

Scheduled for completion by March 1987, the trailing dredge, with a hopper capacity of 3,990 cubic yards, will be used to deepen, maintain, and improve waterways. It will accommodate a crew of 21 and have an American Bureau of Shipping Maltese Cross A-1 Ocean Going classification in addition to a U.S. Coast Guard Ocean classification with unattended automated engine room. The vessel, which has a molded breadth of 54 feet and depth of 22 feet, can dredge to a depth of 70 feet and is equipped with underwater dredge pumps on the drag arms. Its gross tonnage is 2,746, with a lightship displacement of 2,400-tons and loaded displacement of 7,787 tons.

The 10,500-horsepower dredge is propelled by two 2,600-horsepower Nigata Electric drives. Its six main Caterpillar generators product 7,500 kilowatts of power. The vessel can carry 180,000 gallons of fuel and 27,000 gallons of fresh water.

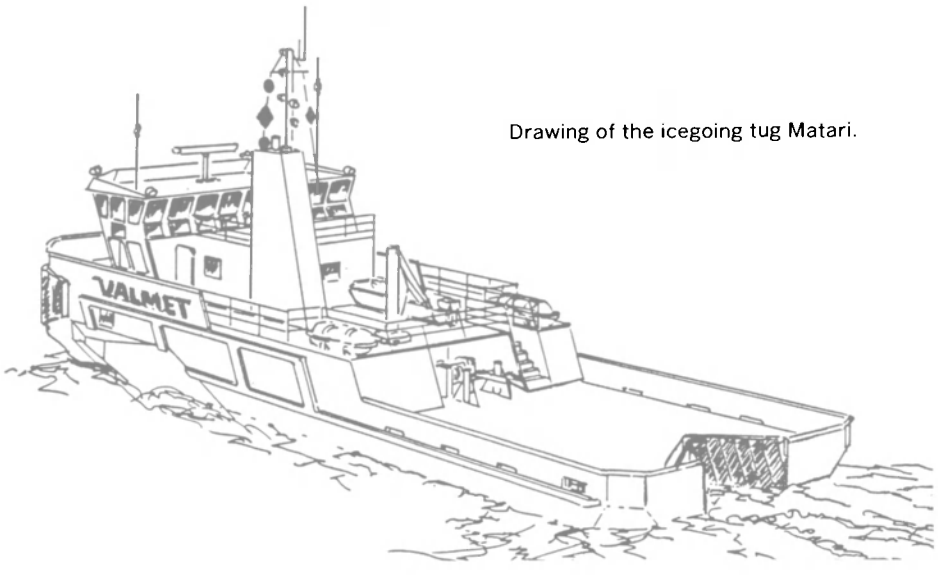
American Dredging Company has been engaged for 119 years in the business of excavating solid material in, out or through rivers, harbors and seas to deepen and maintain ship channels, create harbors, provide fill for rights-of-way, take cables and pipelines across rivers, harbors and other bodies of water, restore and maintain beaches, dig canals, and drill, blast and remove subaqueous rock to improve channels, harbors, coastal areas and marine basins.

McDermott Shipyard, a division of McDermott Marine Construction, specializes in the construction and repair of large tugs, supply boats, barges, dredges, and a wide variety of oceangoing work vessels. McDermott Marine Cosntruction is a major operating unit of McDermott International, Inc., a leading energy services company. The company and its subsidiaries provide worldwide engineering and construction services for industrial and commercial facilities onshore and to the oil and gas industry offshore. They also manufacture steam generating equipment, tubular products, insulating products, and process control systems, and provide trading services for markets around the world.

For more information on McDermott,

Circle 51 on Reader Service Card

Show above at the keel-laying, left to right: **Joe Boutchard,** principal surveyor for New Orleans ABS; **A.D. Pistilli,** president, American Dredging; Capt. **J.W. Klotz,**Chief Inspector, USCG; Comdr. **Scott Cooper,** OCMI, USCG; **W.L. Higgins,** vice president and group executive, McDermott; **Eugene Santhin,** vice president, American Dredging; **Jim Franklin,** vice president and general manager, McDermott; and **Gary Newchurch,** division general manager, McDermott.



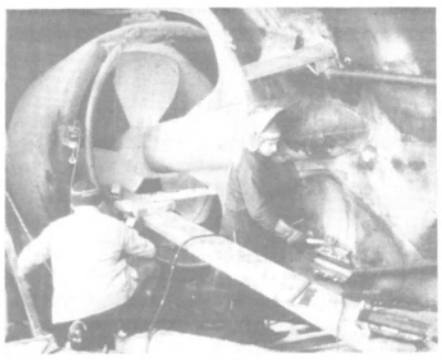
Drawing of the icegoing tug Matari.

Valmet Testing Newly Developed Ducted Propeller For Icegoing Vessels

Valmet's Helsinki Shipyarc, as the culmation of a two-year research program, recently tested a new type of ducted propeller with the tug Matari off the coast of Savonlinna. The new type duct is said to be a new generation propulsion solution for Arctic vessels operating in ice.

As already known, a duct installed around a propeller increases the total thrust by some 30 percent when the propeller is heavily loaded, as it is in ice conditions. At the same time, the duct protects the propeller from bigger ice loads. Until now, the problem has been that the duct gets blocked by large ice floes, and thus the use of ducted propellers has been very rare in spite of the obvious advantages.

As the result of two years of research, Valmet has now developed a patented ducted propeller that solves nearly all the problems related to the blocking of the nozzle. This new development will either increase the icebreaking capability of icegoing vessels or significantly decrease their fuel consumption. The Valmet ice duct is suitable for all types of icegoing vessels, including icebreakers, cargo ships, etc. It



Valmet's new type of ducted propeller for ice conditions being installed.

works in both directions, both forward and astern.

The development of the new type duct is part of Valmet's ongoing research and development program aimed at new solutions and techniques for the icegoing vessels of the future. Started a few years ago, the development work achieved remarkable results last year from tests with the winter trawler Jarvsaar, where an open propeller was compared with a ducted propeller, according to **Mikko Niini,** marketing director of Valmet Helsinki Shipyard. For the first time, Valmet succeeded in documenting the underwater process by recording the propeller-ice interaction on video tape. The testing program was continued this past winter with several vessels, both in sea conditions and in the lake Saimaa.

Building of icegoing cargo ships and offshore supply vessels is one of Valmet's principal plans for the future, Mr. **Niini** said. One proof of this is the newly started five-year research program, and the Valmet investments in engineering facilities in the U.S. and Canada.

In connection with plans for the future, Valmet has, together with Mopro Oy, developed an icebreaking tug that will work as a high-technology testing vessel for the icegoing vessels of the future. Some six to eight different technical solutions will be tested with this vessel. In midwinter when the traffic at the lake Saimaa is laid down, Valmet will use the icebreaking tug and the lake Saimaa as a full-scale ice testing laboratory. Features of this vessel include a new, efficient icebreaking bow, special solutions to decrease friction, and the new ducted propeller.

Valmet plans new projects both in Finland and by the new affiliated company, Valmet Arctic Canada Ltd., founded in Canada at the beginning of this year.

For additional information on Valmet's research and development programs for vessels operating in ice conditions,

Circle 50 on Reader Service Card

Wijsmuller Salvage And Offshore Tugs Inc. Form New Company

Wijsmuller Salvage B.V., one of the world's foremost salvage companies, has joined forces with Offshore Tugs, Inc., the well-known offshore towage company from Golden Meadow, La., to establish a new company: Wijsmuller Salvage & Offshore Tugs, Inc.

The new company will provide complete salvage and towage services for the marine and offshore industry, including removal of offshore equipment, salvage services including cargo and wreck removal for environmental protection.

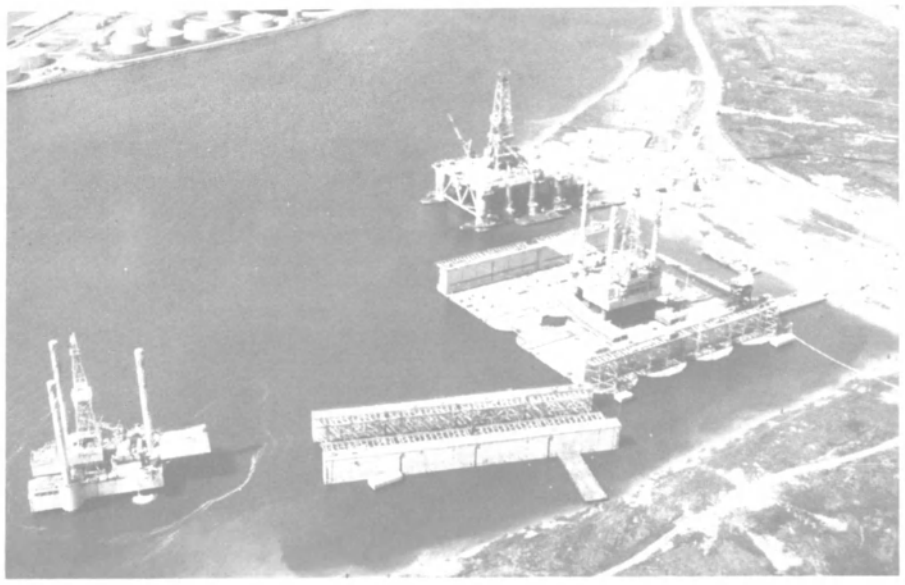
Wijsmuller Salvage, headquartered in Holland, brings an 80-year history of successful international salvage experience into the joint venture with Offshore Tugs, Inc., a company established by **Nolty J. Theriot**.

In addition to a large inventory of highly specialized salvage equipment, which can be air-lifted to any location, the company will provide a large fleet of modern oceangoing tugs, especially equipped for towing, anchor handling and other offshore services. The company has also established relations with Blue Streak Marine, operator of 14 jackup maintenance vessels, and will rely on the extensive facilities and resources of Bell Pass Drydocks.

Management of the newly formed company will be directed by **Joe Jullens**, a professional with many years of experience in worldwide salvage.

For full information,

Circle 25 on Reader Service Card



Bethlehem's Sabine Yard Busy With Drill Rig And Ship Dockings

While one mobile offshore drilling unit is drydocked (photo), two others await their turn at the new Sabine Yard of Bethlehem Steel Corporation in Port Arthur, Texas. The rigs shown are the Comanche (in the dock) and Marlin 4 (left), which were both built by Bethlehem at its nearby Beaumont Yard, and the semisubmersible rig Diamond M New Era. All three rigs were drydocked for repairs and inspection.

Since the Sabine Yard began operations in August 1985, the facility has serviced a total of six ships and four rigs. The yard's floating drydock is one of the nation's largest, and is said to be the only one in the world that can be configured in either a ship or rig mode.

For additional information on the Sabine Yard's facilities and capabilities,

Circle 63 on Reader Service Card

Fleet Oiler Construction At Penn Ship Adds To Beginning Of A New Era

Pennsylvania Shipbuilding Company, Chester, Pa., announced that on Saturday, July 12, 1986, the keel was laid for the first of three new Fleet Oilers (TAO-191, Hull #1) being constructed for the U.S. Navy.

In addition, Penn Ship announced that Monday, June 23, 1986, marked the beginning of fabrication for the second of three new Fleet Oilers (TAO-192, Hull #2) being constructed for the U.S. Navy.

Penn Ship stated that "these events add to the beginning of a new era" at the shipyard and brings with it long-term employment opportunities in the Delaware Valley.

Pennsylvania Shipbuilding Company is one of the USA's largest and most versatile shipyards, engaged in the construction, conversion, overhaul, and repair of all types and sizes of naval and commercial vessels. The company is a wholly owned subsidiary of Capital Marine Corporation.

For more information and color literature on Penn Ship's facilities and capabilities,

Circle 54 on Reader Service Card

Shown at the beginning of fabrication for the second of three new Fleet Oilers are, left to right: **H. Sasaki,** IHI International; **J. Loulies,** USN; **J. Barrios,** Penn Ship; **J. Wittmeyer,** Penn Ship; Capt. **M. Staiger,** USN; Comdr. **K. Sigman,** USN; and **R. Stevens,** Penn Ship.

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Circle 124 on Reader Service Card

PROPULSION UPDATE

Cummins Diesels Selected To Repower Research Vessel Calypso

The well-known Cousteau Society oceanographic research vessel Calypso recently underwent a major refurbishing at the Merrill Stevens Dry Dock Company in Miami, Fla. The vessel's engineers and mechanics installed two Cummins KTA19-M diesels, along with Twin Disc reduction gears, and new shafts, gensets, and electrical systems in preparation for a five-year journey to film a new series entitled "Rediscovery of the World."

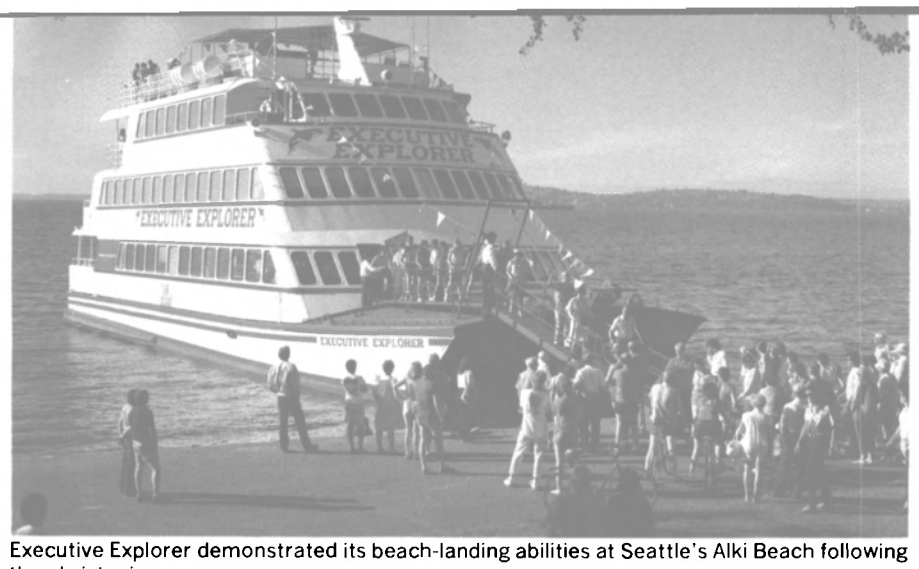
Furnished by Cummins Metropower of the Bronx, N.Y., the KTA19-Ms were selected to replace the vessel's original 1942 vintage twin diesels rated 500 bhp each, which were deemed too old to complete the five-year trip. The Cummins KTA19-M is a six-cylinder, inline, four-cycle turbocharged and aftercooled diesel rated 500 bhp at 1,800 rpm. The new engines are expected to reduce the Calypso's fuel consumption nearly 50 percent and increase cruising speed by as much as two knots. Operating at a derated 1,200 rpm, the KTA19-Ms will consume approximately 7.3 gallons per hour, significantly less than the 14.5 gph required by the old engines.

A 500-bhp Cummins KTA19-M marine diesel, one of two that will repower the research vessel Calypso, is lowered into engine compartment at Merrill Stevens Shipyard.

Built by Ballard Marine Railway Yards in Seattle, the Calypso was originally designated J-826, a YMS Class minesweeper. The 141-foot ship was commissioned into British service in March 1942 as a lend-lease vessel, and was operated in the Mediterranean. She was transferred back to the U.S. Navy in 1947, and in 1949 was sold and converted into a ferryboat that ran between Malta and Gozo Island. It was then that she acquired the name Calypso. In 1950 she was sold to **Jacques Cousteau**, then a young French Navy lieutenant commander, and was soon transformed into an oceangraphic research vessel.

For complete information and detailed brochures on the Cummins line of marine diesel engines,

Circle 49 on Reader Service Card



Executive Explorer demonstrated its beach-landing abilities at Seattle's Alki Beach following the christening.

Nichols Brothers Yard Delivers Luxury Catamaran Cruise Vessel

Nichols Brothers Boat Builders, Inc. on Whidbey Island (Freeland), Wash., recently delivered the luxury cruise vessel Executive Explorer, a catamaran designed to carry 49 passengers, to Glacier Bay Yacht Tours, Inc. of Seattle. The 104-foot, four-deck vessel has a beam of 36 feet 9 inches and full-load draft of 8 feet 3 inches.

Propulsion is provided by two Deutz 816 diesel engines, each with an output of 1,346 bhp, driving five-bladed Nicel propellers manufactured by Columbian Bronze, via Reintjes WVM 842 2.96:1 reduction gears supplied by Karl Senner, Inc. of New Orleans. Top speed for the loaded vessel is 22 knots. She is steered by conventional rudders employing a Wagner steering system supplied by Hough Marine of Seattle. The 5-inch Aquamet 17 shafting was supplied by Coolidge Propeller of Seattle, and propulsion controls are from Systems Engineering. Harco of Portland supplied the silencers.

The vessel has accommodations for a crew of 20 in two bunkrooms in the hulls and several upper cabins. The 25 passenger staterooms are all located on the outside periphery of the Bridge, Upper, and Main Decks. All cabins feature color television, VCR units, mini-bar/refrigerators, and wide windows. Other facilities on the Main Deck include the Vista View Lounge forward, the Explorer Dining Room, and the galley. The topmost Observation Deck is an open solarium.

According to Nichols Brothers president **Matt Nichols**, the Executive Explorer is the first U.S.-flag catamaran cruise vessel of its type built in the U.S. She is the sixth of a series of catamaran vessels built at the Whidbey Island yard to designs by International Catamarans of Australia. Two additional catamarans are currently under construction at the Nichols yard—a 300-passenger excursion day boat and an 86-foot commuter vessel for use in San Francisco Bay by the Red & White Fleet.

Electrical power is supplied by two 120-kw Mercedes-Benz diesel generators supplied by Pacific Diesel of Seattle. A sewage treatment plant supplied by Sea-Land Industries of Tacoma is based on Orca II equipment from Envirovac. Peter Kalby Company of Bellevue engineered and supervised installation of an extensive heating, air conditioning, and ventilations system; one of its functions provides individual HVAC to each stateroom.

Northern Marine Electronics of Seattle supervised installation of the electronics suite, which includes: Furuno FCR 1411/G and F 803D radars, LC 90 Loran C, FSN-90 SatNav, and 108 Weather-Fax; ICCM M-700 SSB and ICM-80C VHF radiotelephones; Ross depth finder; Simrad watch receiver; and Aiphone TB-12F intercom stations.

The Executive Explorer was christened jointly on the Seattle waterfront by **Deborah Ritchie** and **Peggy Giersdorf**, daughter and daughter-in-law of **Robert** and **Lori Giersdorf** of Seattle, owners of the vessel. Immediately following the christening the vessel left for cruising in Alaska. In October this year she will move to Hawaii where Catamaran CruiseLines, a division of Glacier Bay, will operate the vessel on week-long cruises from Honolulu to the major Hawaiian Islands.

For further information and free color literature on Nichols Brothers Boat Builders facilities and capabilities,

Circle 43 on Reader Service Card

Manufacturers (Suppliers)

Main engines (2)	Deutz (KHD Canada)
Reduction gears	Reintjes (Karl Senner)
Shafting	Aquamet (Coolidge)
Propellers	Columbian Bronze
Silencers	Harco
Steering gear	Wagner (Hough Marine)
Propulsion controls	Systems Engineering
Diesel generators	Mercedes-Benz (Pacific Diesel)
Pumps	Paco
Sewage plant	Envirovac (Sea-Land)
Anchor	Danforth
Chain & cable	Everett Steel
Aluminum plate & shapes	Reynolds
Windows & doors	Pacific Coast Marine
HVAC systems	Peter Kalby
Halon system	Wormold (Peter Kalby)
Paints & coatings	Hempel
Electronics	(Northern Marine)
Radars, Loran C, SatNav & weatherfax	Furuno
SSB & VHF radiotelephones	ICCM
Depth finder	Ross
Watch receiver	Simrad
Intercom stations	Aiphone

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Circle 111 on Reader Service Card

AMERICA'S SEAPORTS

—The Dynamics Of Change—

by Rex Sherman
American Association of Port Authorities

For more than three centuries, America's seaports have been centers of population, trade, and vibrant economic activity. Within the past three years, the U.S. seaport industry has emerged from the throes of recession, and today, in many respects, is as healthy and optimistic as it has ever been. Problems remain, to be sure. Not all of our ports have shared in the renewed prosperity. Major legislative questions still await resolution. But basically the news is good. And that is good news—not only for our ports, but for the economic regions they serve and for the national economic and security interests of the United States, as well.

The industry itself is vast, versatile, vibrant, and highly competitive. The United States is served by 183 deepdraft commercial seaports dispersed along the Atlantic, Pacific, Gulf, and Great Lakes coasts. Included in that number, too, are the ports of Alaska, Hawaii, Puerto Rico, and the Virgin Islands. In 1984, America's ports accommodated just over 1.2 billion tons of cargo in the U.S. foreign, domestic ocean, Great Lakes, intercoastal and coastwise trades.

Foreign trade is essential to the United States. The United States annually exports more than 10 percent of its coal production, nearly 40 percent of its wheat and wheat flour, 35 percent of its rice, and 40 to 50 percent of its cotton. About 10 percent by value of U.S. manufacturers are also sold in foreign markets.

Equally important, exports mean jobs—American jobs. Barely 20 years ago, one in 14 American manufacturing workers were engaged in making products for exports. Today, that ratio stands at one in six—an increase of 130 percent. From 1977 to 1980, four out of every five new jobs created in the U.S. manufacturing sector were export related.

America's dependence on imports is equally strong, particularly the strategic materials so essential to its national defense industries. The United States relies heavily on imported minerals—iron ore, petroleum, bauxite, natural rubber, tin, tungsten, cobalt, and manganese, for example. Imported goods and services contribute to the stocks available to American consumers. The processing and distribution of imported goods also generates jobs and income for Americans. Moreover, selling to the United States enables foreign nations to earn the

TABLE 1

PROPOSED PUBLIC PORT EXPENDITURES—FACILITY TYPE—1983-1989
(Millions of Dollars)

COASTAL REGION	CONVENTIONAL CARGO	SPECIALIZED CARGO (1)	DRY BULK	LIQUID BULK	REGIONAL TOTAL
North Atlantic	$199.9	$339.4	$118.2	$1.0	$657.5
South Atlantic	200.8	297.5	36.5	0.0	534.2
Gulf	388.9	191.4	102.4	260.0	942.7
North Pacific	80.4	99.4	0.0	0.9	180.7
South Pacific	105.0	621.4	19.6	74.4	820.3
Great Lakes	30.6	1.3	3.4	0.0	35.3
U.S. Territories	72.5	14.5	7.0	0.0	94.0
TOTAL	$1,078.2	$1,564.6	$286.5	$335.4	$3,264.7

(1) Includes, for example, container, LASH, RO/RO, etc.

SOURCE: U.S. Maritime Administration, **Public Port Financing in the United States**, Volume II, Main Report (Washington, D.C.: June 1985), p. 24.

dollars they need to buy American goods and services.

Trade *is* important. Even more to the point, however, is the fact that more than 95 percent of U.S. overseas merchandise trade by volume and approximately 70 percent by value moves in deepdraft, oceangoing vessels. Consequently, the successful conduct of U.S. foreign waterborne commerce is vitally dependent on the services and facilities provided at U.S. seaports. For many shippers, particularly those involved in the bulk movement of coal, grain, liquids, and the like, there is simply no economical alternative to ocean transport.

Ports are also essential to national security. Major naval installations are located at a number of U.S. ports—a number that will increase if the U.S. Navy's current strategic homeporting initiative comes to fruition. U.S. Marine Corps units are regularly rotated through the ports of San Diego and Moorehead City. Two dozen U.S. ports have been designated by the Department of Defense for use in the initial deployment and resupply of U.S. forces abroad. A number of U.S. commercial ports are also regular participants in military exercises, such as the annual REFORGER exercises in Europe.

Ports have had a central role in virtually every major U.S. conflict since the Revolutionary War times. That has been particularly true in this century, when America's wars have been mostly overseas, with ports serving as staging points for the deployment, supply, reinforcement, and resupply of U.S. forces fighting thousands of miles from our shores. That pattern will almost certainly be repeated in future conflicts. Indeed, the Joint Chiefs of Staff have stated that a major European war, sealift could bear the brunt of the workload in deployment, reinforcement, and resupply efforts. More specifically, they state: "In any overseas deployment, sealift will deliver about 95 percent of all petroleum products. That implies a need, not only for ships, but for ports to load them. And in most instances, these ships would be loaded at commercial port facilities—at terminals developed, owned, and in many instances operated by state and local port authorities.

The port industry contributes importantly to the national economy in other ways. In 1984, according to the U.S. Maritime Administration, commercial seaport activities generated $60 billion in direct and indirect benefits to the U.S. economy and contributed more than $30 billion to the U.S. Gross National Product. The stevedoring marine terminal component of the port industry alone generated $8.4 billion in revenues and salaries, and employed 138,000 persons. Altogether, seaports accounted for more than a million jobs, and billions of dollars in federal, state, and local taxes. During the past four years, imported cargo unloaded at U.S. seaports has produced an average of 70 percent of U.S. Customs receipts from duties. That came to $6.5 billion in fiscal 1983, $8.3 billion in fiscal 1984, and an estimated $9.0 billion in fiscal 1985. A 1986 survey by the American Association of Port Authorities (AAPA) revealed, in addition, that U.S. public port authorities were providing U.S. Customs at nominal or, in most cases, at no charge, facilities and services with a total market value of just under $1.5 million annually.

The growth of ocean commerce and the revolutionary change in marine technology have placed enormous demands on U.S. public port authorities. Between 1950 and 1984, U.S. port traffic more than doubled in volume, with port handlings of imports and exports alone multiplying sixfold, reaching a peak of just over 1.0 billion tons in 1979. Fueling that growth initially was the postwar economic recovery of Europe and Japan, and subsequently, the dramatic rise in imported petroleum and exported grain, and the expansion of U.S. trade with the Soviet Union, the Pacific Rim, and the Middle East.

On the shipping side, the relatively small and undifferentiated merchant-men of two generations ago—the war-built *Victory* and *Liberty*

(continued)

America's Seaports

(continued)

ships and T-2 tankers—have been all but totally replaced by huge tankers, drybulk carriers, containership car carriers, refrigerated ships, and a bewildering variety of other highly specialized vessel types. Ships, on average, have become larger, technologically more sophisticated, and significantly more expensive to build and to operate, requiring equally sophisticated ports to turn them around quickly and keep them on schedule. In response, more than $5 billion was invested in commercial port facilities in the United States from 1946 through 1980. During the period 1973-1983, public port authorities alone invested some $3.0 billion in facilities, and are expected to invest another $3.2 billion in capital improvements between 1983 and 1989, according to the Maritime Administration. More detail as to the pattern of future investment is provided in Table 1.

Note that the Maritime Administration's forecasts do not include port-related investments by private-sector entities, such as coal, petroleum, and grain companies.

Most public port authorities are general purpose in nature with each catering in varying degrees to all types of cargo, bulk, and nonbulk. Leading petroleum import centers are the ports of New York and New Jersey, the Delaware River, the lower Mississippi, the Gulf Coast, and southern California. Coal is shipped in greatest volume from Philadelphia, Hampton Roads, Baltimore, Mobile, New Orleans, and certain ports on the Great Lakes. The Gulf, Pacific Northwest, and the Great Lakes are prime grain exporting areas. Log and timber exports are a specialty of the ports in Oregon and the state of Washington, iron ore of the Great Lakes, and tobacco of the ports of Virginia and North Carolina.

Most U.S. ports are equipped with general cargo terminals—facilities at which merchandise is handled in containers, boxes, barrels, and bales. Thousands of imported automobiles are unloaded at various ports on the East, Gulf, and West Coasts. While regular, transoceanic passenger service is largely a historic memory, a number of U.S. ports are finding the expanding cruiseship business to be extremely lucrative and a considerable source of local economic benefit.

The onset of the 1980s brought with it a host of economic difficulties for U.S. ports. Cargo volumes dropped. Foreign cargo at U.S. ports declined from the 1979 peak to a low of 735.1 million tons in 1983. The sharpest decline occurred in petroleum imports, reflected the combined effects of the OPEC price hikes, the recession in the U.S. economy, conservation efforts, and the substitution of coal and other domestic fuels for foreign oil. High unemployment and the depressed

(continued)

U.S. Oceanborne Foreign Trade
Top Thirty U.S. Ports
All Services
Calendar Year 1984

Thousands Of Long Tons

RANK	U.S. PORT	Total Tons	Pct(1) Change	Import Tons	Pct(1) Change	Export Tons	Pct(1) Change
1	New York	51811	12	47033	13	4778	−1
2	Houston	42221	16	20459	24	21762	10
3	Gramercy	40314	−9	12409	−5	27905	−11
4	New Orleans	35925	10	13623	27	22302	2
5	Norfolk	29070	−16	2615	−32	26455	−14
6	Corpus Christi	22430	47	19955	58	2475	−5
7	Baltimore	20145	4	10264	22	9881	−9
8	Tampa	19427	5	4667	20	14760	1
9	Philadelphia	19385	−2	16786	5	2599	−32
10	Long Beach	17915	+*	7659	9	10256	−6
11	Baton Rouge	17632	1	6326	14	11306	−5
12	Beaumont	14739	−8	11344	−10	3395	−1
13	Newport News	13724	8	2742	27	10982	4
14	Marcus Hook	13624	15	13508	15	116	−15
15	Mobile	13172	116	3425	81	9747	132
16	Portland, Oregon	13148	2	1783	5	11365	2
17	Los Angeles	12327	13	6227	13	6100	13
18	Christiansted, V.I.	12323	+*	11865	−2	458	135
19	Texas City	12253	−14	11595	−15	658	13
20	Pascagoula	10908	13	10735	13	173	25
21	Destrehan	9709	−25	10	−85	9699	−25
22	Tacoma	9363	15	2417	25	6946	12
23	Seattle	8665	119	4104	133	4561	107
24	Galveston	8481	16	868	−5	7613	18
25	Paulsboro	8446	32	8339	35	107	−54
26	Savannah	8076	10	4965	35	3111	−16
27	Freeport, Texas	6724	−16	6071	−19	653	26
28	Wilmington, Del.	6170	−2	6147	−2	23	−52
29	St. Rose	5229	−35	145	−78	5084	−31
30	Port Arthur	5075	−33	3959	−5	1116	−67
	ALL OTHER	168346	16	94510	12	73836	22
	TOTAL	676777	7	366555	12	310222	2

*-Less than 0.5 percent.
(1)-Compared to Calendar Year 1983.

Source: Maritime Administration, Office of Port and Intermodal Development

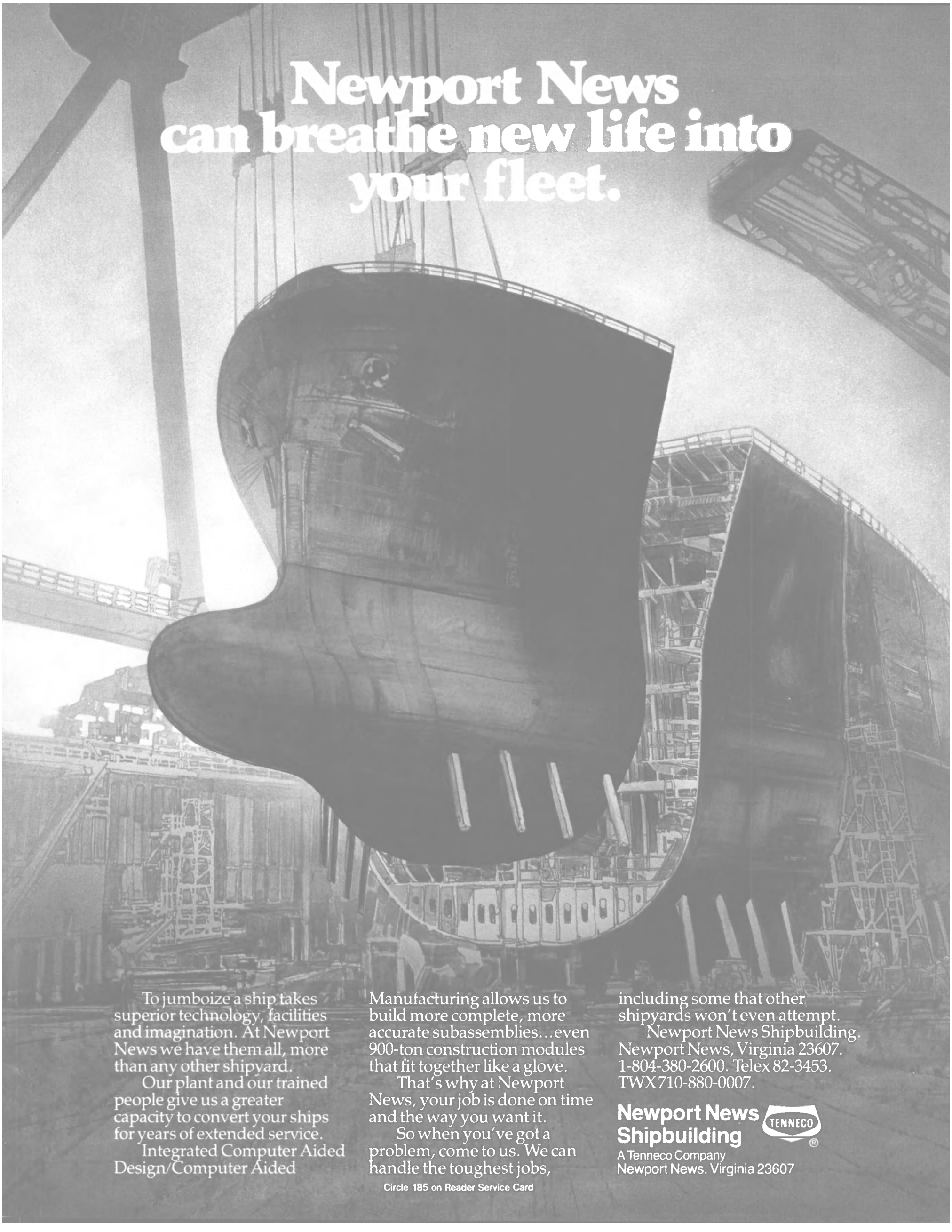
U.S. Oceanborne Foreign Trade
Top Thirty U.S. Ports
Tanker Services
Calendar Year 1984

Thousands Of Long Tons

RANK	U.S. PORTS	Total Tons	Pct(1) Change	Import Tons	Pct(1) Change	Export Tons	Pct(1) Change
1	New York	34914	12	34438	12	476	11
2	Houston	19996	6	14105	11	5891	−3
3	Corpus Christi	17306	39	16350	44	956	−9
4	Marcus Hook	13624	15	13508	15	116	−15
5	Christiansted, V.I.	12323	+*	11865	−2	458	135
6	Texas City	12253	−14	11595	−15	658	13
7	Beaumont	11496	−11	11308	−10	188	−34
8	Philadelphia	11181	−5	11161	−5	20	−77
9	Pascagoula	10908	13	10735	13	173	25
10	Lake Charles	10057	50	9517	57	540	−12
11	Gramercy	9159	−22	8333	−19	826	−38
12	Paulsboro	8446	32	8339	35	107	−54
13	New Orleans	7773	20	5888	12	1885	50
14	Freeport, Texas	6724	−16	6071	−19	653	26
15	Wilmington, Del.	5954	−6	5938	−5	16	−67
16	Boston	5924	52	5918	52	6	−*
17	Port Arthur	5075	1	3959	−4	1116	25
18	Richmond, Cal.	3429	−10	2182	15	1247	−34
19	Baton Rouge	3218	−23	1550	−30	1668	−15
20	Los Angeles	3124	1	1924	1	1200	+*
21	Humacao. P.R.	3078	52	3033	53	45	13
22	Long Beach	2972	−10	1250	−7	1722	−12
23	Honolulu	2822	−27	2353	−33	469	37
24	Portland, Maine	2788	−36	2788	−35	0	−100
25	Tampa	2716	43	1945	25	771	128
26	Newport News	2586	28	2586	28	0	N/A
27	San Juan, P.R.	2148	−11	2139	−11	9	−63
28	Savannah	2120	39	2019	44	101	−14
29	El Segundo	2072	34	1901	25	171	533
30	Martinez	1878	192	555	26	1323	552
	All Other Ports	28853	−25	22428	−26	6425	−22
	Total	266917	4	237681	5	29236	2

*-Less than 0.5 percent.
(1)-Compared to Calendar Year 1983.

Source: Maritime Administration, Office of Port and Intermodal Development



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America's Seaports

(continued)

state of U.S. industry in general lowered overall demand for goods and services, including those purchased abroad. The soaring value of the U.S. dollar against foreign currency effectively increased the price of U.S. goods and services to foreign purchasers. The worldwide recession made matters worse. Although U.S. coal exports surged in 1980-1982, that was not enought to cushion the overall drop in trade.

Since 1983, however, there has been a turn around reflecting, in part, the resurgence of the U.S. economy. In business was good at U.S. ports in 1984, and even better in 1985. Container cargo movements last year reached record highs at many U.S. ports. While petroleum imports and U.S. grain imports remained depressed, the overall picture at U.S. ports is encouraging. One important factor for U.S. public port authorities has been the continued rise in imported dry cargo, a trend that appears to have continued unabated into the first half of 1986, despite the drop in the dollar. U.S. coal exports last year hit a near record high of 92.0 million tons; this year promises to be nearly as good, with foreign buyers rushing to take advantage of low prices for U.S. steam coal. The ongoing OPEC price war appears to have brought a resurgence of U.S. petroleum imports, though volumes are unlikely to ever again reach the peak levels of the 1970s. U.S. grain exports are also expected to recover from last year's dismal performance, reflecting lower U.S. prices engendered by the dollar's fall and the impact of the new farm act. A summary of recent trends in U.S. waterborne imports and exports is provided in Table 2.

Of course, problems remain. The past 10 months have been difficult ones for ports located on the Gulf and Great Lakes, and in the Pacific Northwest. Even though the U.S. dollar continues to decline, U.S. trade is still characterized by a heavy imbalance of imports, meaning that ships typically arrive fully laden at U.S. ports and depart empty or partially loaded. Moreover, international shipping is heavily overtonnage in virtually all of the major trades. Stated differently, available shipping capacity is far greater than total available cargo, a problem that will tend to be exacerbated as new buildings enter the market in greater numbers than those removed by scrapping or retirement. Despite the obvious benefits of foreign trade to the U.S. economy, sentiment persists in Congress and elsewhere for legislation and other governmental actions aimed at curtailing the import of automobiles, steel, lumber products, textiles, and a host of other products.

Federal budgetary problems, particularly those directed at scaling back the enormous national debt, are having their effects on public port management. Examples include reduced manning levels at key federal agencies such as Customs, and limited resource levels for the Coast Guard. In addition, there is an immediate prospect of cost-re-

U.S. WATERBORNE FOREIGN COMMERCE 1979-1985
(Millions of Short Tons)

Exports	1985*	1984	1983	1982	1981	1980	1979
Dry Cargo	317.4	343.2	330.8	333.1	350.3	364.6	324.3
Tanker	34.7	32.9	32.5	70.0	59.1	38.7	75.0
Totals	352.1	376.1	363.3	403.1	409.4	403.3	399.3
Imports							
Dry Cargo	156.0	149.5	117.1	113.5	139.5	140.6	160.8
Tanker	242.8	267.3	254.7	270.3	337.5	352.0	442.8
Totals	398.8	416.8	371.8	383.8	477.0	502.6	603.6
Grand Totals	750.9	792.9	735.1	786.9	886.4	905.9	1002.9

*Estimated
SOURCE: U.S. Department of Commerce

TABLE 2

covery, user fee schemes related to a range of federal activities and services all of critical importance to the flow of waterborne commerce. Agencies involved include the Corps of Engineers, the Customs Service, the Coast Guard, and the Immigration Naturalization Service. Perhaps most troublesome regarding these user fee schemes is the fact that each user fee scheme has been proposed independently, without an understanding or a recognition of the *cumulative impact* of all such cost-recovery schemes on the essential flow of U.S. waterborne commerce.

For the past six years, perhaps the most difficult issue for U.S. public port management has been the Reagan Administration's insistence that the traditional federal role in sponsoring most costs involved in new navigation channel construction and channel maintenance must be significantly reduced. After considerable negotiation and debate, the U.S. public port industry has generally accepted the idea that, in return for new channel projects, an increased local nonfederal share of the total project costs will be required. It should be noted that there has not been an omnibus water projects bill since 1970—nearly 16 years! Moreover, the public port industry has acknowledged the inevitability of a system of user fees established to recover a portion of the Corps maintenance costs. This radical new port development legislation may be enacted by the time this article is published. Clearly, one potential advantage of increased local cost-sharing for federal navigation channel projects is the prospect of greatly speeding up the process by which those projects are approved, funded, and constructed which now takes, on average, more than 25 years.

In spite of these increased cost burdens proposed to be placed on U.S. public port authorities at the federal level, the Reagan Administration and certain members of Congress had proposed, within the rationale of "tax-reform", legislation that would have virtually eliminated the ability of public port authorities to use tax-exempt bonds to finance port facility development. Wisely, both houses of Congress have recognized the fundamental importance of continuing the tax-exempt bond financing capabilities of public ports in tax-reform legislation that is (as of this writing) now in Senate/House Conference Committee. Certain restrictions still need to be resolved, but the basic public purpose of public port authorities to develop facilities needed to serve the essential flow of U.S. waterborne commerce has again been confirmed by the U.S. Congress.

In short, the outlook for the U.S. public port industry is positive. U.S. public port authorities continue to demonstrate their ability to fulfill their critical responsibilities in promoting the interests of their local communities, their region, and the nation. ■

U.S. Oceanborne Foreign Trade
Top Thirty U.S. Ports
Liner Service
Calendar Year 1984

Thousands Of Long Tons

RANK	U.S. PORT	Total Tons	Pct(1) Change	Import Tons	Pct(1) Change	Export Tons	Pct(1) Change
1	New York	10283	7	7789	15	2494	−14
2	Long Beach	5726	14	3378	22	2348	5
3	Seattle	4667	18	2254	28	2413	9
4	Houston	4388	17	1574	38	2814	8
5	Los Angeles	4373	15	2498	15	1875	15
6	New Orleans	4276	2	1840	19	2436	−7
7	Baltimore	3961	17	2447	53	1514	−15
8	Oakland	3893	23	1569	43	2324	13
9	Savannah	2626	24	1185	42	1441	12
10	Charleston	2434	11	960	21	1474	5
11	Norfolk	1730	9	952	19	778	−1
12	Portland, Oregon	1289	34	316	53	973	29
13	Miami	1235	12	659	31	576	−4
14	Philadelphia	1199	4	922	7	277	−6
15	Galveston	829	−27	226	−36	603	−23
16	Tacoma	705	28	487	23	218	39
17	San Juan, P.R.	668	10	356	20	312	+*
18	Jacksonville	640	6	270	2	370	9
19	San Francisco	588	2	288	8	300	−3
20	Wilmington, N.C.	567	7	203	22	364	1
21	Longview	469	−10	3	−91	466	−5
22	Mobile	424	−3	144	11	280	−9
23	Port Everglades	404	22	336	23	68	19
24	Corpus Christi	396	196	18	−18	378	238
25	Baton Rouge	356	29	130	76	226	12
26	Boston	299	−22	230	−20	69	−27
27	Coos Bay	272	4	1	−67	271	5
28	Wilmington, Del.	216	41	209	43	7	7
29	Newport News	211	−7	130	17	81	−30
30	Richmond, Va.	189	25	62	29	127	23
	All Other Ports	4199	8	1456	33	2743	−2
	Total	63512	12	32892	23	30620	2

*-Less than 0.5 percent.
(1)-Compared to Calendar Year 1983.

Source: Maritime Administration, Office of Port and Intermodal Development

America's Seaports

(continued)

U.S. Oceanborne Foreign Trade
Top Thirty U.S. Ports
Non-Liner Service
Calendar Year 1984

Thousands Of Long Tons

RANK	U.S. PORT	Total Tons	Pct(1) Change	Import Tons	Pct(1) Change	Export Tons	Pct(1) Change
1	Gramercy	31155	−4	4076	49	27079	−9
2	Norfolk	27340	−13	1663	7	25677	−14
3	New Orleans	23876	9	5895	50	17981	−*
4	Houston	17837	30	4780	82	13057	18
5	Tampa	16711	1	2722	21	13989	−2
6	Baltimore	16184	11	7817	40	8367	−7
7	Baton Rouge	14058	8	4646	42	9412	−4
8	Mobile	12748	125	3281	86	9467	143
9	Portland, Oregon	11859	−*	1467	−1	10392	−*
10	Newport News	10927	4	26	−19	10901	4
11	Destrehan	9709	−24	10	−74	9699	−24
12	Long Beach	9181	−4	3031	5	6150	−8
13	Tacoma	8658	14	1930	25	6728	11
14	Galveston	7652	23	642	15	7010	24
15	Philadelphia	7005	2	4703	38	2302	−33
16	New York	6614	19	4806	18	1808	21
17	Corpus Christi	5684	104	3587	189	2097	35
18	St. Rose	5229	−19	145	245	5084	−20
19	Longview	5168	−3	601	13	4567	−5
20	Los Angeles	4830	21	1805	26	3025	17
21	Seattle	3998	8	1850	−3	2148	19
22	Superior	3410	34	0	N/A	3410	34
23	Coos Bay	3274	7	8	300	3266	7
24	Beaumont	3243	2	36	−10	3207	2
25	Savannah	3229	−13	1660	15	1569	−31
26	Aberdeen-Hoquia	2747	−6	0	−93	2747	−5
27	Jacksonville	2747	6	1453	7	1294	5
28	Charleston	2533	42	946	2	1587	84
29	Port Lavaca	2525	3	2371	1	154	48
30	Duluth	2110	20	88	−86	2022	82
	ALL OTHER	64107	26	29937	25	34170	26
	TOTAL	346348	9	95982	31	250366	3

*-Less than 0.5 percent.
(1)-Compared to Calendar Year 1983.

Source: Maritime Administration, Office of Port and Intermodal Development

AAPA's 1986 Annual Convention Set For Miami

The American Association of Port Authorities will hold its 75th Annual Convention September 28-October 2 at the Omni International Hotel in Miami. Founded in 1912 and headquartered in Alexandria, Virginia, AAPA represents public seaport agencies throughout the Western Hemisphere, from Canada to Argentina, including all of the major public seaport authorities in the United States. Each year, the Association holds its Convention in a different port city. The 1986 Convention, hosted by the Port of Miami, is expected to attract more than 900 registrants.

This year's program continues the tradition established in previous AAPA Conventions in addressing the complex and wide-ranging challenges that confront modern day port managers. Among the topics to be examined in general discussion sessions are strategic planning, the insurance crisis as it pertains to public port management, and the future of the Panama Canal.

Other special workshops will consider the effect of the pending water resources development legislation on port planning and management strategies, factors involved in cargo routing decisions by carriers and shippers, the cruise ship market, maritime and port security (with particular emphasis on the terrorist threat), export trading companies and foreign trade zones as marketing tools, and sister ports.

Among the featured speakers will be former Secretary of Agriculture **Orville Freeman**, whose topic, "Agricultural Exports and Macroeconomics," is of special importance not only to public port authority management, but to all involved in the marketing and distribution abroad of America's farm commodities.

Essential components of any AAPA Convention are the meetings of AAPA's Board of Directors and the technical and policy committees, the election of officers, and the approval of AAPA's standing policy resolutions.

Of particular interest should be the special social program planned for the Miami Convention. The exciting round of social activity will include a "cruise to nowhere," a "wild hog bar-b-q," and a black tie dinner/dance honoring this year's AAPA chairman, **Alvaro Gallardo** of Costa Rica. Optional activities range from a tour of the Villa Vizcaya Museum to fashion shows, shopping tours, boat cruises, sporting events, and much more.

In addition, special tribute will be paid at the 1986 Convention to AAPA's Latin American port members.

For more information, please contact **Lori Goodman** at the Port of Miami (305-371-7678) or **Kurt Nagle** at AAPA headquarters (703-684-5700).

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U.S. TANKER PORTS

Location, Draft And Particulars 1986

PORT/ TERMINAL	LOCATION	MAX. DRAUGHT	MAX. LOA	REMARKS
Albany	42.40N—73.45W	9.1m	229m	
Amesville	29.54N—90.07W	10.4m w.d.		
Anacortes, Wash.	48.31N—122.36	13.7m	305m	Puget Sound Refinery max. 65,000 dwt.
Anchorage	61.12N—150.00W	10.7m MLW		
Atreco	29.59N—93.53W	12.2m F.W.		Max. 50,000 dwt.
Avondale	29.55N—90.11W	12.2m w.d.		Int. Tanker Term. Airdraught 170m
Baltimore	39.13N—76.35W	12.2m	247m	Exxon Pier 1
Barbers Point	21.28N—158.07W	10.7m		Honolulu, Hawaii
Baton Rouge	30.27N—91.11W	9.1m/11.3m (x)	305m	(x) Depending on season. Humble Oil Dock
Bayonne, N.Y.	40.39N—74.05W	11.6m w.d.		Conotable Hook. No r.f.
Baytown, Tex.	29.44N—95.01W	11.9m	274m	Exxon
Beaumont, Tex.	30.05N—94.05W	11.9m w.d.	274m	
Benicia	38.03N—122.10W	11.6m w.d.		Exxon Berth. Lighten to 11m F.W.
Boston	42.21N—71.05W	10.9m (x)	204m	Exxon-Everett. Max. beam 27.4m (x) Top of tide. No r.f.
Bridgeport, Conn.	41.10—73.11		251m	Max. 70,000 dwt.
Brownsville	25.54N—97.28W	10.4m	229m	Exxon Refinery
Bucksport	44.35N—68.49W	11.3m HW	224m	Max. 38,000 dwt.
Carteret, N.J.	40.35N—74.13W	10.6m		
Chalmette	29.56N—90.00W	12.2m w.d.	230m	Tenneco Oil
Charleston	32.47N—79.56W	10.7m	229m	Texaco Terminal, Inadequate r.f.
Chelsea, Mass.	42.23N—71.02W	10.7m w.d.		American Oil
Cherry Point, NC	34.00N—76.07W			
Chicago	41.50N—87.45W	7.9m	223m	Max. St. Lawrence Seaway
Cleveland	41.28N—81.40W	7.9m	223m	Seaway max.
Coos Bay	43.22N—124.13W	9.1m	229m	
Corpus Christi	27.48N—97.23W	12.2m	259m	
Delair	See Philadelphia.			
Detroit	42.20N—83.05W	7.9m	222m	Seaway max.
Eagle Point	47.34N—122.30W	12.2m w.d.		
El Segundo	33.55N—118.28W	17.1m		Max. 165,000 dwt.
Eureka	40.48N—124.10W	10.7m	226m	
Everett, Mass.	42.24N—71.03W	12.2m (x)	247m	Exxon. (x) Top of tide.
Everett, Wash.	47.59N—122.13W	12.2m	208m l.b.	
Fall River	41.42N—71.10W	9.8m w.d.		
Ferndale, Wash.	48.49N—122.33W	12.2m w.d.	305m	
Freeport, Tex.	28.57N—95.21W	11m	209m	
Galveston	29.17N—94.50W			
Garryville, La.	30.03N—90.35W	12.4m (x)	365m	(x) <100,000 dwt. Seasonal changes. 12.8m> 100,000 dwt.
Good Hope	29.59N—90.24W	12.1m w.d.		
Gretna, La.	29.15N—90.02W	10.6m w.d.		See New Orleans
Harbor Isl.	27.52N—97.04W		305m	Humble Pipeline
Houston	29.45N—95.20W	11.9m	249m	Max beam 35m. "Seahorse Marine": Barge for oily water. Depending on oil content and other items, the owner gets paid. "Empak" handles chem. slops. They charge by the gallon depending on type of chemical. Other chem. terminals in the area can handle certain types of slops. Prior arrangements have to be made.
Huntington Beach	33.39N—117.59W			
Ingleside	27.51N—97.14W	12.2m	305m	Sun Pipeline.
Jacksonville	30.20N—81.40W	10.4m	195m	
Kenai	See Nikisiki (Alaska)			
Key West	24.33N—81.48W	9.7m	230m	
Lake Charles	30.13N—93.15W	11.6m	305m	Continental Oil Co. Berth 1. No r.f.
Long Beach	33.45N—118.13W	19.8m MLLW	335m	Arco Tanker Berth. No r.f.
Longview	46.08N—122.59W	12m		80 km up river. 91.4m width channel.
LOOP La. (Louisiana Offshore Oil Port)	28.52N—90.00W	29.4m w.d.	427m	3 SPMs
Los Angeles	33.34N—118.16W	15.5m MLLW	366m	Western Fuel Oil (San Pedro, berth 120) $ 1,50/bbl Standard Oil (S.P. berth 101) $ 0,80/bbl + $ 300. Barges outside 12 miles limit, 6,000 bbls $ 0,45/bbl, 12,000 bbls $ 0,44/bbl, 18,000 bbls $ 0,42/bbl USGG advise tankers to dispose of ballast water prior to arrival L.A.

New Intertanko Publication— 'TANKER PORT PARTICULARS 1986'

Owners, brokers and charterers must know before fixing if the tanker is suitable for the ports concerned throughout the world. Is the draft satisfactory? Any other restrictions regarding maximum length, beam or otherwise? And not least: What about reception facilities for ballast water and slops?

The second edition of Intertanko's handy "Tanker Port Particulars" was issued in 1982. Intertanko's port information office has now prepared a revised edition. Several additional ports and terminals have been added, and information about ports and terminals has been upgraded. Furthermore, a great deal of additional information is given regarding reception facilities for ballast water, slops, etc.

By concentration on ports usually called at by tankers, the publication gives all key information required in a concentrated publication of 80 pages. This makes it an excellent tool for owners, charterers, shipbrokers and ship masters.

The port data contained in the above Maritime Reporter table covers only U.S. ports and terminals and was reprinted from "Tanker Port Particulars 1986," issued in June of 1986. This valuable reference book also contains data on primary tanker ports throughout the entire world and covers all countries from Albania to Zaire.

"Tanker Port Particulars" is available from Intertanko, P.O. Box 1452 Vika, N-0116 Oslo 1, Norway. Telex 19751 ITANK N. Price, US$50 for members and subscribers, US$100 for others.

New District Manager, Marine Operations, At Transoceanic Cable Ship

Lawrence E. Cahill has been appointed district manager-marine operations for the Transoceanic Cable Ship Company of Morristown, N.J., a wholly owned subsidiary of AT&T.

In that position, Mr. **Cahill** will be responsible for managing the operations of AT&T's two cable ships, the C.S. Long Lines and the C.S. Salernum.

Mr. **Cahill** will report to **James M. Barrett,** deputy director-international engineering for AT&T and the Transoceanic Cable Ship Company.

Mr. **Cahill** joined AT&T in 1984 as project manager on the C.S. Salernum. In that position, he supervised the refurbishing of the newly purchased AT&T vessel to bring it up to U.S. Coast Guard standards.

Ameroid DC Disc Cleaner Approved For Cleaning Westfalia Disc Stacks —Literature Available

Drew Ameroid® Marine has received approval from Westfalia Separator for use of Ameroid DC disc cleaner in cleaning Westfalia Separator disc stacks.

Ameroid DC disc cleaner is a specially formulated blend of surfactants, solvents and acids designed to remove carbonaceous and varnish deposits from lube and fuel oil separator discs. Satisfied customers have shown that they can save up to 75 percent in labor over previous cleaning methods.

The Westfalia approval notes that the cleaning ability of Ameroid DC is very good. In addition, they advise that corrosion testing showed that the stainless steel discs are resistant to the cleaner and the metallic surface was shining after the test.

Ameroid DC is normally available in 25 liter pails. It is available in most of Drew Ameroid Marine stocking locations around the world.

For additional information on AMEROID DC or any of the other services,

Circle 22 on Reader Service Card

PORT / TERMINAL	LOCATION	MAX. DRAUGHT	MAX. LOA	REMARKS
Magpetco	30.02N—93.59W			See Port Neches
Marcus Hook	39.49N—75.25W	11.6m MLW(F.W.)	259m	Sun Oil Term.
Marrero	29.54N—90.06W	11.6m w.d.(F.W.)	Unl.	Amerada Hess Term.
Martinez	38.01N—122.08W	12.8 MLW	Shell Dock	
Miami	25.46N—80.11W	9.1m MLW	305m l.b.	Priv. road tanker r.f. Barge r.f. USD 10/t.
Mobile	30.40N—88.02W	12.2m (x)	274m	Hess Pipeline. (x) Brackish.
Morehead City	34.43—76.42W	12.2m (x)		(x) Depth channel.
Moss Landing	34.48N—121.48W	19.8m w.d.		MBM. Max 50,000 dwt
Nederland, Tex.	25.59N—94.00W	12.0m F.W		Tankers> 137,000 dwt may enter subj. to approval.
New Bedford	41.38N—70.55W	9.lm	213m	
New Haven, Conn.	41.18N—72.55W	10.4m		Exxon Term. Max. 50,000 dwt.
New London	41.12NN—72.06W	11.0m w.d.	213m	
New Orleans	30.00N—65.22W	11.6m		Max. 150,000 dwt. BP and Tenneco no r.f. Fees and duties on sludge removal and waste oil.
New York	40.43N—74.00W	14.1m MLW	244m	Arrival time for vsls> 12.2m is limited to certain tidal conditions.
Newark	40.44N—74.10W			See New York
Newington, NH				See Portsmouth
Newport News	36.59N—76.26W	10.7m	192m	Exxon Term. Barge r.f.
Nikisiki, Alaska	60.41N—151.24W			> 40 ft max. 80,000 dwt.
Norfolk	36.51N—76.19W	12.3m (x)		Exxon. (x) MHW (brackish). Max. 70,000 dwt after lightering.
Northport	40.56N—73.22W			
Northville				See Riverhead
Oak Point	29.56N—90.04W	12.2m	<unl.	Chevron Chemical
Oakland	37.50N—122.18W	10.7m	208m	Lower side.
Ostrica	29.22N—89.32W	13.7m w.d.		Gulf Refinery
Palm Beach	26.46N—80.03W	10.4m	198m	Belchor Oil Term.
Panama City	30.05N—85.46W	9m	Unl.	
Pasadena	29.43N—95.13W	10.7m	213m	General American.
Pascagoula	30.21N—88.34W	11.5m		Standard Oil. Max. 100,000 dwt.
Paulsboro	39.50N—75.15W	11.9m w.d.(F.W.)	Unl.	Mobil Oil Term. No r.f.
Pennsauken	40.00N—75.03W	10.4m F.W.	244m	Greater Valley
Pensacola	30.25N—87.13W	10.7M MLW	183m l.b.	
Perth Amboy	40.30N—74.16W	10.4m	251m	Chevron Oil
Philadelphia	30.57N—75.10W	16.8m		See also Marcus Hook. Vsls of 16.8m lighter 10 n.m. off pilot station.
Piney Point	38.08N—76.32W	11.6m	Unl.	
Plaquemine	30.14N—91.19W	10.9m w.d.F.W.	234m	Dow Chem. Co.
Point Breeze	39.55N—75.10W	9.8m	175m	Arco Short Pier.
Port Allen, La.	30.28N—91.12W	12.2m w.d. F.W.	Unl.	Airdraught 51.8m
Port Arthur	29.35N—93.57W	11.6m (x)	366m	Gulf Oil. (x) brackish.
Port Canaveral	28.25N—80.35W	9.9m	213m	Belcher Oil Term.
Port Everglades	26.05N—80.06W	11.3m MLWS	366m	
Port Isabel	26.04N—97.14W	10m	207m l.b.	
Port Jefferson	40.58N—73.05W	9.1m MLW	205m	Power Station. No r.f.
Port Neches	30.00N—93.57W	11.7m w.d.	305m	Texaco Term.
Port San luis	35.10N—120.45W	9.8m MLW	914m l.b.	
Port St. Joe	29.49N—85.19W	10.4m		
Portland, Me.	43.39N—70.11W	14.3m MLW		Portland Pipeline. Pier no. 2. Max. 110,000 dwt.
Portland, Or.	45.30N—122.40W	12.1m	286m	R.f. for vsls using yard services.
Portsmouth, NH	43.04N—70.43W	10.7m w.d.	198m l.b.	No r.f.
Portsmouth, Va.	36.50N—76.17W	10.7m	396m	Craney Isl. Term.
Providence	41.49N—71.24W	10.4m w.d.	183m l.b.	
Puget Sound	See Anacortes			
Quincy	42.16N—71.00W	9.1m w.d.	171m	
Revere	42.25N—71.00W	10.7m	183m	Airdraught 29.3m. Union Oil.
Richmond, Calif.	37.56N—122.23W			See San Francisco
Richmond, Va.	37.32N—77.25W	9.6m	168m	
Riverhead, Long Island	41.00N—72.39W	18.3m	350m	North Berth, Northville Industries Corp. No r.f.
Rocky Point	41.11N—124.8W			
St. James	30.00N—90.48W	12.2m w.d.	244m	Capline Term. Airdraught 51.8m
St. Lawrence Seaway		7.9m	222m	Max. beam 22.9m
St. Rose	29.56N—90.20W	9.8m w.d.	Unl.	Internat. Tanker Term. Airdraught 51.8m.
San Diego	32.41N—1170.07W	9.1m		
San Francisco	37.48N—122.25W	10.7m MLW		Airdraught 40.8m
San Pedro	33.43N—118.17W			See Los Angeles
Savannah	32.28N—68.56W	10.4m	201m	Max. beam 30.5m
Seattle	47.36N—122.20W	10.7m	198m l.b.	Max 122,000 dwt. p.c.
Sewaren	40.33N—74.15W			See New York

ABBREVIATIONS: dwt Deadweight Tonnage; F.W. Fresh Water; Isl. Island; l.b. Length of Berth; loa Length Overall; m Meter(s); max. Maximum; MBM Multibuoy Mooring; n.m. Nautical Miles; p.c. Part Cargo; r.f. Reception Facility; SMB/SPM Single Buoy/Point Mooring; term. terminal; unl. Unlimited; Vsl Vessel; w.d. Water Depth. *TIDES—H* High/Higher/Highest; L Low/Lower/Lowest; M Mean; N Neap; W Water; MLWS Mean Low Water Spring Tide.

Bollinger Named Chairman Of Louisiana Shipbuilding And Repair Association

The Louisiana Shipbuilding and Repair Association recently elected its board of directors and officers for the 1986-87 year.

Richard N. Bollinger, a director of Bollinger Machine Shop and Shipyard, Inc., Lockport, La., was elected chairman of the board of LSRA. Reelected as president (executive director) was Rear Adm. **W.H. Livingston,** USN (Ret.). **Ronald Isaac** of Algiers Iron Works & Drydock Company was named treasurer, and Mrs. **Darla Boudreaux** continues as secretary.

The Association, now in its 14th year of service, is dedicated to the promotion of the welfare of the shipbuilding and repair industry in the State of Louisiana by conducting the usual trade association activities. Membership consists of Louisiana shipyards and associated companies such as vendors, suppliers, marine surveyors, naval architects, etc.

For further information, contact the Association at 5163 General DeGaulle Drive, New Orleans, La. 70114.

Marinette Marine Names Chief Piping Engineer

Charles Smelley has recently joined the Marinette Marine Corporation as chief piping engineer in the shipbuilder's engineering and design department. Mr. **Smelley** has over 35 years of experience in piping engineering and engineering management. A majority of that time was spent with Fluor Incorporated in Texas and Canada.

Navy Selects Ingalls For Planning Reactivation Of Battleship Wisconsin

The Navy recently announced that Litton Systems Inc., Ingalls Shipbuilding Division of Pascagoula, Miss., has been selected for the preliminary planning of the reactivation and modernization of the USS Wisconsin (BB-64).

Litton was awarded a $1-million firm-fixed-price contract with a firm-fixed-price option for the planning effort. The contract includes planning initial production, material procurement, evaluation of additional or revised government requirements and establishment of detailed schedules and budgets for the reactivation and modernization of the battleship.

The work will be performed in Pascagoula, and is expected to be completed by September 3 of this year. The contract was competively procured, with six bids solicited and one offer received.

$18.4-Million Contract To Norfolk Shipbuilding For Sub Tender Overhaul

Norfolk Shipbuilding and Drydock Corporation, Norfolk, Va., is being awarded an $18,431,371 firm-fixed-price contract for conducting the regular overhaul availability of USS L.Y. Spear (AS-36) as part of a competitive test program between public and private shipyards. The contract will cover repairs and alterations to the hull, electrical, mechanical and combat systems. Work will be performed in Norfolk, and is expected to be completed in June 1987. Fourteen bids were solicited and four offers were received. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-H-8195).

Newport News Shipbuilding And SNAME Sponsor Ship Production Symposium

August 27 To 29, 1986

Design and production concepts to reduce shipbuilding schedules and costs is the theme for the 1986 Ship Production Symposium to be held at the Williamsburg Lodge, August 27-29, 1986, in Williamsburg, Va. The symposium is under the auspices of the National Shipbuilding Research Program and is being sponsored by Newport News Shipbuilding, and hosted by the Hampton Roads Section of The Society of Naval Architects and Marine Engineers.

The reduction of shipbuilding schedules and costs is a vital necessity recognized by all in the maritime industry. New design and production concepts play a major role in the achievement of this goal. The National Shipbuilding Research Program 1986 Ship Production Symposium includes technical presentations that cover a diversity of topics. This three-day program, developed by the 1986 Ship Production Symposium Steering Committee headed by **W. R. (Pat) Phillips Jr.**, provides a forum for the presentation of the latest developments in design and production concepts, which will affect schedules and costs dramatically over the next decade.

The Technical Program Committee, chaired by **R. L. Harrington**, has selected 23 stimulating and thought-provoking papers by authors both nationally and internationally that cover the range of subjects being addressed by the Ship Production working groups. The program outline with authors and papers are listed in the Technical Program for the 1986 Ship Production Symposium that follows.

The program has been arranged to take advantage not only of state-of-the-art technical subjects but also the Virginia Peninsula and its wealth of history. Special activities and social events planned include a keynote luncheon address by Vice Adm. **J. H. Webber**; the presentation of the Kennedy Award by **Perry W. Nelson**, president of the Society; a bus tour of the construction facilities at Newport News Shipbuilding, followed by a reception on Wednesday. On Thursday, there will be a tour of Carter's Grove Plantation, and high tea at the Williamsburg Lodge. The world-famous Groaning Board Banquet, complete with Colonial entertainment, is scheduled for the afternoon and evening respectively; and on Friday a presentation on the reconstructed Godspeed is planned, with a tour of the ship on Friday afternoon.

1986 SHIP PRODUCTION SYMPOSIUM TECHNICAL PROGRAM

Sessions: Wednesday, August 27, 1986

8:30 am—"The Annual Report of the National Shipbuilding Research Program," **J. W. Brasher, W. L. Christensen** and **V. W. Rinehart.**

10:00 am—"Soviet Shipbuilding: Productivity Improvement Efforts," **Boris S. Butman.**

11:00 am—"An Integrated Procedure for Hull Design and Production," **Renzo Di Luca;** "Decentralization—The Management Key to Effective Accuracy Control," **Tamara S. Upham** and **W. Mark Crawford.**

12:00—Keynote Luncheon—Presentation of Kennedy Award by **Perry W. Nelson**, president of the Society; Address by Vice Adm. **J. H. Webber,** USN, Chief of Naval Engineering, NAVSEA.

2:00 pm—"Technical Collaboration Between Mitsubishi Heavy Industries and Todd Shipyards," **Lennart M. Thorell** and **Toshio Watanabe;** "The Streamlining of Navy Procurement Specifications," **Charles H. Piersall Jr.** and **Charles J. Sinche.**

3:00 pm—"Comparison of the Construction Planning and Manpower Schedule for Building the PD214 General Mobilization Ship in a U. S. Shipyard and in a Japanese Shipyard," **Howard M. Bunch;** "Laser Line Heating," **Kevin Scully.**

4:30 pm—Bus tour of Newport News Shipbuilding, followed by reception in main office, Building 520, 6th floor; buses will load at the Williamsburg Lodge.

Sessions: Thursday, August 28, 1986

8:30 am—"Planning for Shipyard Surface Preparation and Coating," **J. A. Cantor** and **R. F. Endert;** "The Benefits of a Modified-Chemistry, High-Strength, Low-Alloy Steel," **John C. West.**

10:00 am—"An Analysis of Shipyard Painting Costs," **Daryl L. George;** "Reduced Fillet Weld Sizes for Naval Ships", **Ed Gaines.**

11:00 am—"Adaption of Japanese Prefabrication Priming Procedure to U. S. Shipbuilding Methodology," **K. A. Trimber** and **W. D. Corbett;** "Investigation of Tubular Electrodes Designed for Submerged Arc Welding Applications," **R. A. Whannell** and **B. H. Halverson.**

2:00 pm—"Engineering for Ship Production," **Thomas Lamb;** "Automatic Submerged Arc Welding with Metal Powder Additions To Increase Productivity and Maintain Quality," **Philip D. Thomas.**

3:00 pm—"Unit Work Guide for Zone Outfitting in Repair and Overhaul," **Shel Kjerulf;** "Generative Process Planning by Expert System," **Frank A. Logan.**

7:00 pm—Groaning Board Banquet, Virginia Room, Williamsburg Lodge

Sessions: Friday, August 29, 1986

8:30 am—"The Establishment of Shipbuilding Construction Tolerances," **James D. Butler** and **Timothy R. Warren;** "The Development of an Initial Graphics Exchange Specification (IGES) Capability," **Daniel J. Wooley** and **Martin L. Manix.**

10:00 am—"Thermal Spraying in the United States Navy," **Stephen Vittori;** "The Automatic Cutting, Marking, and Processing of Structural Sections," **Gunter C. Wilkens** and **John M. Kalogerakis.**

11:00 am—"The Reproduction of the Godspeed," **Duncan Stewart** and **William Boze.** This paper will be followed by a tour of the Godspeed at Jamestown at 2:00 pm.

For additional information and to receive a symposium brochure, contact **W. B. Woolard Jr.,** Registration Chairman, 1986 Ship Production Symposium, P.O. Box 315, Newport News, Va. 23607.

PROPULSION UPDATE

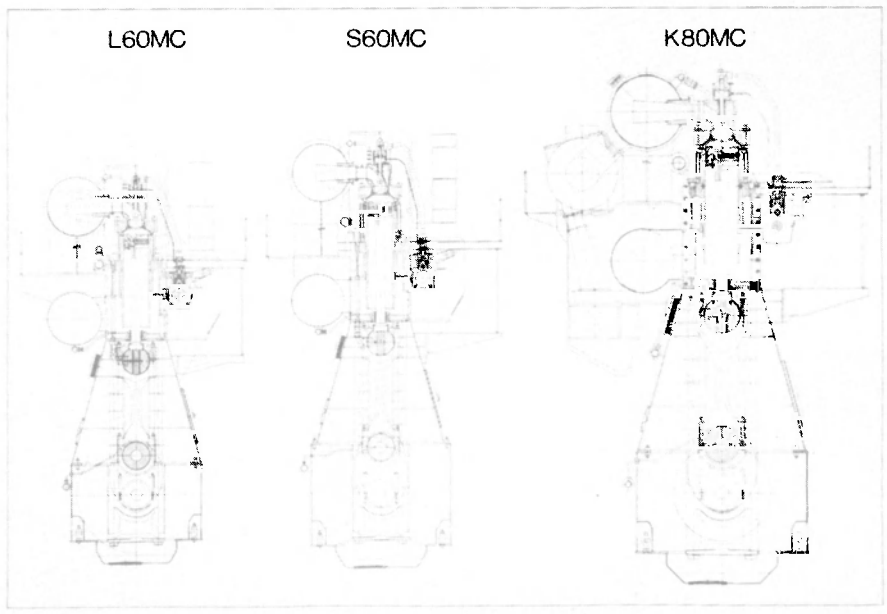
M.A.N.-B&W Offers Cost-Saving Systems For Their MC Engines —New Brochures Available

With their line of MC engines well-established in the marine industry, M.A.N.-B&W Diesel A/S is now focusing on the continuing expansion of their engine program and its application possibilities, including the use of turbo compound systems, which have kept pace with the increased specialization in the shipbuilding sector.

The current range of M.A.N.-B&W two-stroke engines comprises three variants of long-stroke engines—the K-MC, L-MC and S-MC.

As a new feature which will expand opportunities for the application of MC-engines, a special version designated the MC-GI, is now being introduced. The MC-GI engine (GI stands for gas injection) will, through the application of a unique high pressure gas injection technology, enable the use of natural gas and other combustile gases in the engines at outputs and thermal efficiencies identical to those of current heavy fuel burning MC-engines.

This system, which has been demonstrated in operation on a full scale 35MC engine and approved by the classification societies, now represents an economically attractive propulsion alternative for LNG carriers and for stationary power plants.



Cross-section drawings of K, L and S-MC engines. **Courtesy of M.A.N.-B&W Diesel A/S**

Realizing that the engine process itself needs only a certain turbocharger efficiency, the high efficiency of the latest versions of the turbochargers (M.A.N. NA/TO and BBC VTR-4A) makes it possible to obtain even lower fuel consumption by utilizing part of the exhaust gas in a Turbo Compound System (TCS).

(continued)

MAN-B&W

(continued)

The TCS comprises a gas turbine which is driven by an exhaust gas by-pass. The turbine can be connected mechanically to the main engine front end, via a gear box. The "surplus" exhaust gas is therefore utilized by by-passing the turbocharger and using it to drive a gas turbine unit, thus producing mechanical energy. The power obtained is fed back to the main engine, thereby reducing the fuel oil consumption at the same output power.

According to the company, when a TCS unit is installed, savings of up to 5 g/bhph can be obtained, and based upon an oil price of $170 per ton, means a savings of approximately $50,000 for every 10,000 bhp per 250 days of operation.

Another cost-saving product offered by M.A.N.-B&W is the PTO—power take-off—which is a generator driven by the main engine via a hydraulic frequency control box (RCF—Renk Constant Frequency) mounted on the side of the main engine for producing electrical power for a ship.

The company maintains that up to $23,000 worth of fuel oil and maintenance can be saved for every 250 days in operation, when a 550-kw PTO unit is used on a 5L70MC engine at 80 percent mcr (based on a fuel oil price of $170 per ton).

M.A.N.-B&W also is offering a system which combines the use of both PTO and TCS called PTO/PTI.

For free color brochures, catalogs and additional information on MC engines,

Circle 45 on Reader Service Card

For further information and a free color brochure on TCS, PTO and PTO/PTI,

Circle 46 on Reader Service Card

Honeywell Marine Systems Division Restructures Marketing Organization —Literature Available

Honeywell has restructured the marketing organization of its Marine Systems Division. **John Brenan,** marketing director for Marine Systems Division, said the restructuring is part of an ongoing effort to strengthen the division's responsiveness to both military and commercial customers.

In the restructuring, members were named to the marketing team. **John Bader** is marketing manager of sonar systems and subsystems; his supporting staff is **Ken Mohn, Brad Homes** and **Joan Pohl. Ray Janis** is marketing manager for undersea weapons. **Charles Meeks** is the international marketing manager for undersea weapons.

Caroline Richards is marketing manager for mine countermeasures and antisubmarine warfare surveillance; her support staff is **Dave Haan. Bill Ridley** is marketing representative of antisubmarine warfare services. **John Owen** is marketing manager of offshore oil business area; his support staff is **Bill Gronvold** and **Sue Garrood**.

Free literature is available describing Honeywell marine systems equipment. For free copies,

Circle 14 on Reader Service Card

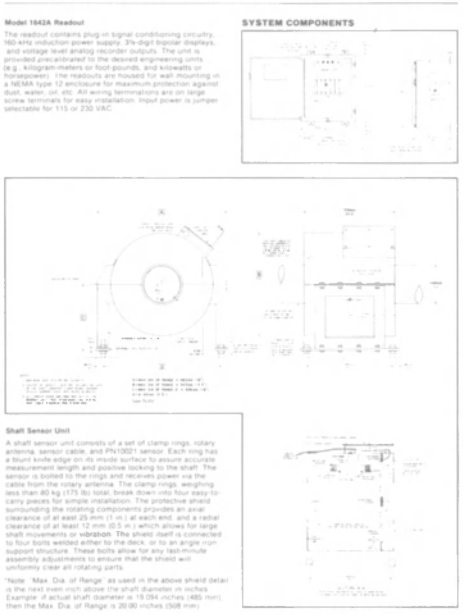
Sumitomo Machinery Offers 14-Page Brochure On 2000 Series Fractional Gearmotors

Sumitomo Machinery Corp. of America, Teterboro, N.J., has issued a new 14-page bulletin that illustrates and describes the features and specifications of its SM Cyclo 2000 Series Gearmotors. Information includes construction details of single and double reduction models, selection tables, allowable overhung load, load ratings, oilseal and bearings information, and model dimensions for both horizontal and vertical types, from ⅛ hp to 3 hp.

For a free copy,

Circle 39 on Reader Service Card

Free Eight-Page Brochure On Marine Powermeters Offered By Acurex



Acurex Model 1600A Series Horsepower Measurement Systems consist of two major interconnected units. A shaft sensor unit that measures the torque and rpm, and a readout that displays torque, rpm, and calculated horsepower.

Acurex Corporation, Autodata Division, Mountain View, Calif., has published a free eight-page brochure on "Powermeters for Marine Environments."

The introduction explains that the Acurex Model 1600A Series Horsepower Measurement Systems are used to display instantaneous horsepower and rpm on large ship's main propulsion shafts. Horsepower is computed from torque and rpm. The Acurex horsepower meters are used for a variety of applications including fuel conservation system, ship's powerplant monitor, sea trials horsepower meter, twin-screw load balancing, and hull fouling determination.

The system mounts directly on the main propulsion shaft and requires only 56 cm (22 inches) of shaft length. All systems are totally precalibrated, requiring no further adjustment. The Model 1600A measurement systems continuously display shaft horsepower, torque, and rpm.

Features and benefits include: ready to use immediately after installation; easy and rapid installation; no shaft redesign or disassembly; shaft sensor operates in harsh environments; low maintenance; not affected by torsional pulses; and zero and full-scale calibration verification while underway.

In addition to a description of the system, the publication discusses system components, operation, 1600A specifications, options, etc.

For a free copy of "Powermeters for Marine Environments" from Acurex Corporation,

Circle 12 on Reader Service Card

Adm. Jeremiah Nominated As Director, Navy Program Planning

Secretary of Defense **Caspar W. Weinberger** announced recently that the President has nominated Rear Adm. **David E. Jeremiah,** U.S. Navy, for appointment to the grade of vice admiral and assignment as Director, Navy Program Planning, OP-090, Office of the Chief of Naval Operations. Admiral **Jeremiah** is presently serving as Director General Planning and Programming Division, OP-90, Office of the Chief of Naval Operations.

Liberty Cruise Applies For Title XI To Construct $11,230,000 Cruise Vessel

The Maritime Administration has received a Title XI application from Liberty Cruise Line, Inc. of St. Louis, Mo., to aid in financing the construction of a 140-passenger cruise vessel.

The vessel will be operated in the inland coastal waterways on the Atlantic Coast of the U.S. and in the Virgin Islands. It will measure 247 feet, have a beam of 40 feet, and a draft of 8 feet 3 inches, depth of 12 feet 6 inches, and a speed of 12 knots.

The Title XI guarantee would cover $8,422,500, or about 75 percent of the estimated actual total cost of $11,230,000.

Delivery is anticipated in 1988.

ONS '86 SHOW AND CONFERENCE ATTRACTING STRONG INTEREST FROM EXHIBITORS

August 26-29—Stavanger, Norway

The 7th Offshore Northern Seas (ONS '86) Conference and Exhibition, to be held in Stavanger, August 26-29, continues to benefit from Norway's expansive offshore policies and the associated demand for advanced technology and services to meet challenging conditions.

Heavy demand for stand space at this year's exhibition indicates that international interest in this event remains strong. The exhibition is expected to be roughly the same size as the 1984 event in terms of stand space, covering a net area of some 14,000 square meters. This space was fully booked by the June 1, 1985 deadline, with the number of exhibitors this year unlikely to fall below the 1984 record of some 600 companies from 16 countries on about 450 stands.

U.S. companies, which have traditionally made substantial deliveries to Norway's offshore sector, are accordingly expected to maintain and even expand their presence at ONS '86. New this year will be a stronger emphasis on grouping exhibits by category in the catalog, to assist visitors in identifying the areas of interest and making the best use of their time. Visitors to the ONS exhibition this year are expected to remain at about the 1984 level of about 33,000 professionals from around the world.

The concurrent ONS Conference will begin at 11 am on Tuesday, August 26 with an Inaugural Ceremony. Following an introduction by **Leif Terje Loddensol**, chairman of the ONS Executive Committee, Stavanger Mayor Ms. **Kari Thu** will welcome the delegates. Norwegian Prime Minister Ms. **Gro Harlem Brundtland** will then discuss "Norwegian Petroleum Policy," followed by the Keynote Address to be delivered by **Jean-Claude Paye**, Secretary-General, OECD, Paris.

The three-session General Conference beginning on August 27 will approach the ONS '86 theme of "Northern Waters: New Political, Economic, and Technical Opportunities and Concerns" from the point of view of senior managers. Each session will feature a leading speaker with one or two supporting contributors. The intention of the general conference is to attract the attention of senior policy-makers and involve them in the discussions on strategic issues; time will be alloted for this purpose.

The general sessions will be followed on August 27-29 by specialist sessions devoted to production systems, gas transportation, reservoir engineering, drilling, and exploration.

The special conference on production system concepts in deep water is designed to provide an overview of current progress in this area. Presentations will extend from experience with systems already in operation—such as Central Cormorant and Northeast Frigg—through those now being designed or constructed for a variety of Norwegian fields such as Gullfaks, Oseberg, and Troll. Both fixed and floating installations will be covered.

Topics to be covered in the session on alternatives for transportation of northern seas gas reserves include Norwegian gas resources, with the emphasis on their extent and geographical location, and alternative methods for distribution to markets. Pipeline solutions in the North Sea, the Halten Bank, and the Tromso Bank will be considered, with special attention given to LNG and processing options for converting gas into easily transported fuels or power.

Some of the technical challenges that must be overcome in order to produce North Sea reservoirs efficiently will be covered in the special conference on reservoir engineering and enhanced recovery through a series of case studies from four Norwegian North Sea fields. Each of these presentations will focus on the approach adopted for finding solutions to complex reservoir and production problems in the Snorre, Oseberg, Valhall, and Frigg fields.

The special conference on drilling has been divided into two sessions, covering the impact of petroleum legislation on drilling, and the needs, direction, and aims of research in this field. Safety regulations were developed by the authorities in cooperation with the oil industry at an early stage in Norway's offshore development, and have been revised several times. Disagreements on interpretation between the industry and regulatory bodies have demonstrated the need for good and continuous dialogue between the two sides to insure that rigs are built and operated to acceptable standards.

The final special conference will be devoted to exploration/utilization of research results and prospects in Polar regions. Different aspects of utilizing exploration research by industry will be covered in the morning session, reflecting the emphasis given by Norway's concession policy to industrial spin-offs from R&D. The afternoon session will focus on the challenges and productivity of the Barents Sea and other hostile Polar regions, where exploration is in its very early stages.

General Conference Program
August 27: Energy Politics

In addition to the worldwide picture, this session will embrace the growing importance of the northern area where oil and gas are concerned. The emphasis will be on long-term perspectives, volatility, and uncertainties, as well as the scope and timing of possible contributions from Arctic regions.

Chairman: **F. Lied**, ex-minister of industry and ex-chairman of the board of Statoil, Oslo

9:00 am—**P. Schwartz**, head of business environment group planning, Shell International Petroleum Company, London

10:00 am—**J.M. Stanford**, president, Petro-Canada Resources, Petro-Canada Inc., Calgary

10:30 am—**E. Bergsager**, senior vice president-corporate management, Geco A/S, Stavanger

11:00 am—Coffee break

11:20 am—**Panel Discussion**

Moderator: **L.U. Thulin**, executive vice president, Den norske Creditbank, Oslo

Delegates: **T. Bergem**, executive vice president, Norsk Hydro A/S, Oslo; and Messrs. **Bergsager, Schwartz**, and **Stanford**

Energy Economics

Both long-term and immediate prospectives will be discussed under this heading. The lead presentation will also reflect on the economic consequences of expensive energy, including the capital investment and time required to substitute for cheap oil. Chairman: **J. Oxnevad,** senior executive vice president, Statoil, Stavanger

2:00 pm—**C.T. Maxwell,** vice chairman of the board of directors, Cyrus D. Lawrence, Inc., New York

3:00 pm—Coffee break

3:20 pm—**B. Weymueller,** vice president-group finance, Societe Nationale Elf Aquitaine, Courbevoie

3:50 pm—**R.L. Oliver,** manager-corporate & energy analyses, corporate planning department, BP International Ltd., London

4:20 pm—Discussion

August 28: Technology—Alternative Approaches

The lead speaker in this session will discuss alternatives available from a systems viewpoint as we approach deeper water and more hostile environments. Supporting contributions will supplement with recent experience from Arctic regions.

Chairman: **C. Ellertsen,** president, Norwegian Petroleum Consultants A/S, Oslo

9:00 am—**H. Ager-Hanssen,** senior executive vice president, Statoil, Stavanger

10:00 am—**D. G. Marrs,** president and general manager, Mobil Oil Company Ltd., Toronto

10:30 am—Coffee break

10:50 am—**R. Knowles,** manager-FCP planning, Atlantic Richfield International, Los Angeles

11:20 am—Discussion

Noon—Lunch

August 27: Special Conference Production Systems

The northern seas are at the forefront of the most advanced developments in deepwater production systems, and this program is designed to provide an overview of current progress.

Chairman: **P. Kassler,** managing director, A/S Norske Shell, Oslo

9:00 am—"Four Years of Experience with the Central Cormorant UMC," by **M. Osborne,** head of the UMC project, Shell Expro UK Ltd., Aberdeen

9:40 am—"Status of Subsea Production on Frigg Satellites," by **R.H. Brand,** production operations department manager, Elf Aquitaine Norge A/S, Stavanger

10:20 am—Coffee break

10:40 am—"Present Developments and Trends for Subsea Production Systems in the Norwegian Sector of the North Sea," by **T. Andvig,** assistant manager-oil division, A/S Kongsberg Vapenfabrikk, Kongsberg

11:20 am—"Compliant Tower Applicability Offshore Northern Europe," by **L.D. Maus,** research supervisor, Exxon Production Research Company, Houston

Noon—Lunch

2:00 pm—"Design of a Tension Leg Platform for Gas Production," by **J. Odland,** section leader, Statoil, Stavanger

2:40 pm—"SWOPS—A Production System for Cyrus Field and Beyond," by **K.R. Winkle,** chief production engineer, BP Exploration Company Ltd., London; and **N. Strachan,** senior petroleum engineer, BP Petroleum Development, Aberdeen

3:20 pm—Coffee break

3:40 pm—"Flexible Risers for North Sea Floating Production Systems," by **B. de Bailliencourt,** director, Ugland Coflexip A/S, Paris

4:20 pm—"The Subsea Atmospheric System (SAS) Development and Testing Status," by **E. Schei,** program manager-SAS project, Kvaerner Subsea Contracting A/S, Oslo

Thursday, August 28: Gas Transportation

Topics covered in this session will include Norwegian gas resources, with the emphasis on their extent and geographical locations, and alternate methods for distribution to markets.

Chairman: **M. Reed,** vice president, Norwegian Shipowners' Association, Oslo

9:00 am—"Norway's Gas Reserves: An Overview of Existing Reserves, Markets, and Prospects for Future Gas Transportation," by **A.B. Moe,**

deputy director general, Royal Norwegian Ministry of Petroleum and Energy, Oslo
9:30 am—"The Impact of Technology Advances on the Conversion of Remote Northern Norwegian Gas to Marketable Liquid Products," by **G. Atkinson,** supervisory process engineer, and **P. Pool,** process manager, Fluor Europe Ltd., London
10:15 am—Coffee break
10:30 am—"Concepts for Seaborne Transportation of Liquefied Gases and Gas Products," by **H.H. Iversen,** assistant director, Moss Rosenberg Verft A/S, Oslo
11:15 am—"The Economics of Alternative Transportation Solutions for Norway's Northern Gas Reserves," by **T. Wergeland,** assistant professor, Institute for Shipping Research, Norwegian School of Economics and Business Administration, Bergen
Noon—Lunch
2:00 pm—Panel presentations of main conclusions from the morning session
Chairman: **M. Reed,** vice president, Norwegian Shipowners' Association, Oslo
2:30 pm—General discussion
3:15 pm—Coffee break
3:30 pm—"Statpipe—Early Experience from Operation of an Integrated Gas Gathering and Terminal System," by **E. Sael,** general manager-Statpipe, Statoil, Haugesund
4:15 pm—"Two-phase Flow Research at Sintef and IFE: Some Experimental Results and a Demonstration of the Dynamic Two-phase Flow Simulator 'Olga'," by **P. Fuchs,** staff engineer, Statoil, Trondheim

Reservoir Engineering

Some of the technical challenges that must be overcome in order to produce North Sea reservoirs efficiently will be covered in this afternoon session through a series of case studies from four Norwegian North Sea oil and gas fields.
Chairman: **S. Nja,** director, Norwegian Petroleum Directorate, Stavanger
2:00 pm—"Preliminary Reservoir Development Evaluation—Snorre Field," by **R.R. Rounsaville,** reservoir section manager, Esso Norge A/S (E&P), Oslo
2:40 pm—"Oseberg: Late Stage Development," by **T. Torvund,** department manager, Norsk Hydro A/S, Bergen
3:20 pm—Coffee break
3:40 pm—"Valhall: Production from High Porosity Chalk," by **G. King,** research engineer, Amoco Research Center, Tulsa
4:20 pm—"The Analysis of Water Encroachment in the Frigg Field," by **A. De Leebeeck,** head of studies section, Elf Aquitaine Norge A/S, Stavanger

Friday, August 29: Drilling

This special conference on drilling has been divided into two sessions, in the morning covering the impact of petroleum legislation on drilling, and in the afternoon the needs, direction, and aims of research in this field.
Chairman: **O. Tuxen,** general manager-drilling department, Norsk Hydro A/S, Stavanger
9:00 am—"Impact of Norwegian Regulations on Statfjord Field Drilling Operations," by **D.N. Willis,** drilling engineering supervisor, Mobil Exploration Norway Inc., Stavanger
9:40 am—"A Rig Owner's View on Norwegian Regulations," by **H. Krafft,** technical director, Gotaas-Larsen Offshore Ltd., London
10:20 am—Coffee break
10:40 am—"The New Petroleum Legislation: Its Enforcement and Its Implications with Regard to Drilling Operations," by **M. Ognedal,** director-safety department, Norwegian Petroleum Directorate, Stavanger
11:20 am—Panel Discussion
Moderator: **O.J. Kvinnsland,** director, Noroil Publishing House Ltd., Stavanger
Panel members: **K. Kjeldstad,** drilling manager, Statoil; **H. Krafft,** technical director, Gotaas-Larsen Offshore; **B. Legris,** drilling operations manager, Elf Aquitaine Norge; **E.B. Nagell Bjordal,** safety manager, Norsk Hydro; **M. Ognedal,** safety department director, NPD; and **D.N. Willis,** drilling engineering supervisor, Mobil Exploration Norway
Noon—Lunch
Afternoon chairman: **C. Kwantes,** operations superintendent, E&P, A/S Norske Shell, Stavanger
2:00 pm—"Needs of Drilling R&D," by **R. Rose,** director, A/S Norske Shell, Oslo

(continued)

Offshore Northern Seas

(continued)

2:40 pm—"Presentation of Drilling Statistics," by **R. Mathiesen,** section manager, Norwegian Petroleum Directorate, Stavanger
3:00 pm—Coffee break
3:20 pm—"New Developments Within Drilling Technology," by **S. Stokka,** department manager, Rogaland Research Institute, Stavanger
4:00 pm—(Comments on the above presentations) by **A. Rodland,** state secretary, Royal Norwegian Ministry of Petroleum and Energy, Oslo

Friday, August 29: Exploration

Different aspects of utilizing exploration research by industry will be covered in the morning session of this special conference; the afternoon session will focus on the challenges and prospectivity of the Barents Sea and other hostile Polar regions.

Chairman: **H. Brandsaether**, senior vice president, Geco A/S, Oslo
9:00 am—"Introduction to Conference Topics," by **E. Bergsager,** chairman of the ONS Conference Committee, and senior vice president-corporate management, Geco A/S, Stavanger
9:10 am—"Computer Technology in Exploration: Driving the Wedge to Success," by **G.W. Rice,** director-geoscience systems division, North American Exploration Services, Conoco, Inc., Ponca City, Oklahoma.
9:50 am—"Acquisition and Processing of Seismic Data from Below Glaciers: Experiences and Technology," by **P.F. Owen,** chief geophysicist, BP Petroleum Development (Norway) Ltd., Stavanger
10:25 Coffee break
10:45 am—"Aspects of Migration from a Theoretical Point of View," by **D.H. Welte,** Gesellschaft fur Integriete Explorationssysteme (IES) GmbH, Julich, West Germany
11:25 am—"Application of New 3D Technology to Recent Field Development in Norway," by **I. Gausland**, chief geophysicist, Statoil, Stavanger; and **T.V. Karlsson,** manager-corporate geophysical support, Geco A/S, Oslo
11:50 am—Discussion
Noon—Lunch

Afternoon chairman: **J. Champeny,** exploration manager, Esso Norge A/S (E&P), Stavanger
2:00 pm—"Norway: Research and Commercial Exploration Hand in Hand," by **S. Horvik,** district manager, Esso Norge A/S (E&P), Harstad
2:45 pm—"The C.O.S.T. Well: Its Significance and Lessons Learned," by **D.M. Hite,** division exploration manager, southeast onshore region, Arco Exploration and Technology Company, Plano, Texas
3:10 pm—Coffee break
3:30 pm—"Arctic Oil and Gas: Exploration and Incentives," by **Walter W. Nassichuk,** director, Institute of Sedimentary and Petroleum Geology, Geological Survey of Canada, Calgary
4:10 pm—"Antarctic: Recent Advances in the Understanding of the Continental Shelf," by Prof. **C. Hinz,** Bundesanstalt fur Geowissenschaft und Rohstoffe (BGR), Hanover, West Germany

ONS '86 EXHIBITORS

ACN-Articulated Columns Norway A/S
AO-Engineering A/S
Aerospatiale
Aker (Aker mek. Verksted A/S)
Alfsen og Gunderson Stavanger A/S
Peder Alhaug A/S
Allweiler AG
Alsthom Atlantique
A/S Aluweld Engineering
Amoco Norway Oil Company
Andersen & Odegaard A/S
Monrad Andersen group
Asea Haegglunds A/S
Aspelin-Stormbull A/S
Asteo
Ingeniorforretningen Atlas A/S
Atlas Copco A/S
Austrian Trade Delegation
Autokon Data A/S
Autronica A/S

BBV group
BP Petroleum Development (Norway)
Baker Sand Control
Barents Base Kirkenes
Belgian Foreign Trade Office
Bell Helicopter Textron
Bennex A/S
Bergens Mekaniske Verksteder A/S
Bergenske Services A/S
Sigvald Bergesen group
Boeing Vertol Company
Bredero Norwegian Contractors
British Embassy
Brück GmbH
Brül & Kjaer Norge A/S
Arne Bo Pedersen & Sonner A/S

CFEM
Cameron Iron Works
Canada
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Chr. Michelsen Institute
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A/S Clausen, Kaldager & Co.
Coast Center Base A/S & Co.
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Computervision A/S
Conoco Norway Inc.
Consafe Engineering A/S
Controllsystem A/S
Cybernetix A/S
A/S Cylinderservice

Danyko A/S
Deminex (Norge) A/S
Diamant Boart A/S
Digital Equip. Corp A/S
Dresser UK Ltd.
Du Pont de Nemours International SA
Dusseldorfer MessegmbH - NOWEA -
Dyno

ECA/CSI
EFA Elektro A/S
ENI
ETPM

A/S El-trade
A/S Elektrisk Bureau
Elektro Union A/S
Elf Aquitaine Norge A/S
Haakon Ellingsen & Sonn
Elteco A/S
Endress + Hauser A/S
ESAS A/S
Esso Norge a.s, Expl. and Prod.
Excon A/S
Expo Media AB
Export Promotion Denmark

Fagersta-Haak A/S
Femo Norden a.s
Finnish Foreign Trade Assn.
Flopetrol International S.A.
Fluor Great Britain Ltd.
Foxboro Great Britain Limited

GEP
GKL Gummi A/S K. Lund & Co.
GMC group
Gamma Instruments A/S
A/S Gentrade
Geoservices
W. Giertsen A/S
Ing. Per Gjerdrum A/S
Glamox A/S
Graco Norge A/S
Gulf Publishing Company
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Industrifilter-AAF AB
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Institut Francais du Petrole
Intergraph Norge A/S
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Intervision A.S.
Italian Institute for Foreign Trade

JaMek Industri A/S
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KME A/S
Kobe Steel Ltd.
Eivind Koch TV-Rorinspeksjon A/S
Kurt Kohorn Ltd. A/S
A/S Kongsberg Våpenfabrikk
Krympespesialisten A/S
Kvaerner group

Lanne Elektriske Verksted A/S
Alf I. Larsen A/S
Lauritzen & Thommessen A/S
Hans Lindflaten A/S
Ljusne Kätting AB
Lumax A/S
Rolf Lycke A/S

Malthus A/S
Mammoet Transport Norge A/S
Mar-El A/S
Marconor A/S
Maris NC a/s
Maritime Hydraulics A/S
Maritime Protection A/S
Master Marine A/S
Hans A. Mathiesen A/S
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McDemott Norge
Mecman AS
Didr. Mehn-Andersen A/S
H.C.A. Melbye A/S
Mento A/S
Mobil Exploration Norway Inc.
Frank Mohn A/S
Monopol-Hempel A/S
Morgenstierne & Co.

(continued on page 46)

Daewoo-Built Vehicle Carriers To Have MacGregor-Navire Access Equipment

South Korea is the latest nation to land an order for the building of the ship type known as the pure car/truck carrier (PC/TC). Daewoo Shipbuilding, one of Korea's newest and most versatile yards, has entered the growing car carrier building market with an order for construction of two 5,250-unit PC/TCs for Ugland, one of two Norwegian partners who constitute the Oslo-based HUAL car-carrying consortium.

A comprehensive shipset of cargo access equipment designed by MacGregor-Navire (Kayaba) Ltd.—MGN's Tokyo-based, joint venture partner in Japan—will provide efficient vehicle access and transfer. The ships' internal layout, particularly with regard to the positioning of the many adjustable ramps, was the subject of exhaustive study. Designed to achieve the most efficient routing for wheeled cargo, the solutions were arrived at with computer-aided design (CAD) assistance.

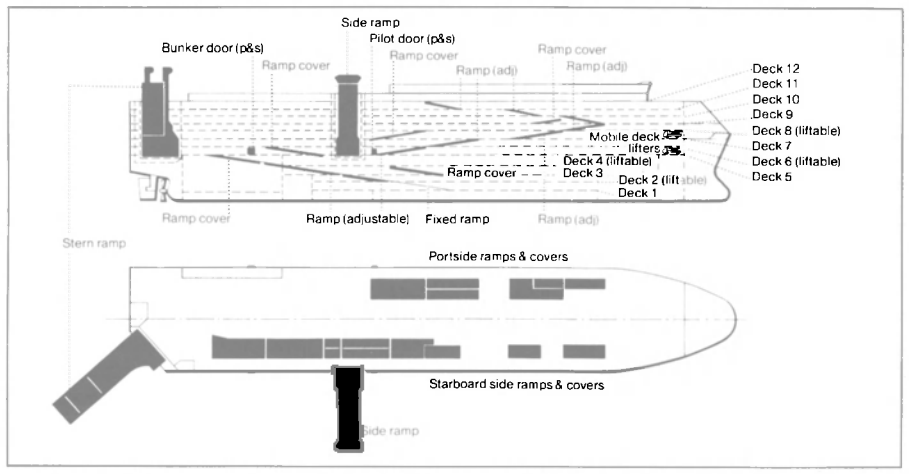
In brief, MGN (Kayaba) will supply the following items of cargo access gear per ship: an angled stern ramp/door and side ramp/door; nine internal ramps and four internal ramp covers; four liftable car decks, each covering the complete cargo area; two mobile deck lifters; four shell doors, two for bunker and two for pilot access; and a main hydraulic pump station. Individual control stands/indicator panels will be provided for each separate equipment item.

The hydraulically operated quarter stern ramp/door, articulated into three sections, will open to angle at 35.5 degrees to the ship's center line and be hinged to the ship at Deck 5. Designed to sustain a unit load of 150 tons, it doubles as a watertight door closing the stern opening.

The hydraulically operated side ramp/door is in two sections including flap. Hinged at Deck 5 (but adjustable to give access to Deck 6), it is designed for a maximum load of 22 tons, or an axle load of 13.6 tons on four wheels.

The nine hydraulically operated internal ramps are designed to stow horizontally, flush with the surrounding deck, and to sustain the same loading as the deck. Ramps stowing on Deck 7 close to form a gas/watertight seal, while those on Decks 3, 9, and 11 are gastight only.

All equipment will be designed, built, and fitted to comply with the construction and safety standards required for classification by Det norske Veritas. In addition to on-site control, all equipment maneuvering indications are duplicated in the wheelhouse.



Drawing of comprehensive shipset of MacGregor Navire cargo access equipment.

The fact that these ships are designed for cargo-carrying versatility is indicated by the four integral decks being capable of sustaining three, six, and in the case of Deck 5, 12 times the weight of the car; and also by two key items of MGN access equipment—the four liftable car decks and the 150-ton-capacity stern ramp. A further indication of preparedness for a carry-all role is the fact that HUAL is to deploy the ships on round-the-world routes when they are delivered in the first and second quarters of 1987.

For additional information and free comprehensive brochures on MacGregor-Navire cargo access equipment

Circle 55 on Reader Service Card

Litton Receives $25-Million Modification For Lead Yard Services

Litton Systems Incorporated, Ingalls Shipbuilding Division, Pascagoula, Miss., is being awarded a $25,000,000 modification to a previously awarded cost-plus-fixed-fee contract for lead yard services for the CG-47 Aegis shipbuilding program. Work will be performed in Pascagoula, and is expected to be completed in May 1987. The Naval Sea Systems Command, Washington, D.C., is the contracting activity (N00024-85-C-2060).

PROPULSION UPDATE

Fairbanks Morse Engine Division Ships First Colt-Pielstick PC4.2

The first of a series of Colt-Pielstick PC4.2 engines built by the Fairbanks Morse Engine Division of Colt Industries has been shipped to Avondale Shipyards in New Orleans, La. The delivery of this engine culminates four years and tens of thousands of man hours related to the planning, parts machining, assembly and testing of the largest engine manufactured in the United States.

Two of these 10-cylinder engines will provide 32,000 horsepower for powering U.S. Navy tanker-oiler vessels. The mission of the tanker-oiler ships will be to fuel other ships at sea. The Navy program has begin with the building of two ships, the USS Henry J. Kaiser and the USS Joshua Humpheries at Avondale Shipyards. A total of seven ships out of a possible 20 overall are, or will be, in the building stages at Avondale and Penn Ship.

The advanced designed Colt-Pielstick PC4.2V gives the U.S. maritime and electric utility industry the most compact, highest horsepower, medium-speed diesels with proven realibility and economy manufactured in the United States. The PC4.2V offers a power range of 12,100 kw to 21,800 kw or 16,300 to 29,300 hp in a single engine. The engine has the capacity to burn residual fuel of up to 6,000 sec. Redwood 1 at 100°F with a 400-ppm vanadium content. The bore and

stroke is 570 mm x 620 mm. In the T-AO Program, the 40,000-long-ton displacement ships must be versatile, carrying diesel fuel, support personnel and dry cargo as well as being fast enough to keep up with a cruising force. In operation, the two engines will turn controllable-pitch propellers in opposite directions that will enable the 35-foot-draft vessel to achieve speeds faster than conventional supply vessels.

For additional information,

Circle 52 on Reader Service Card

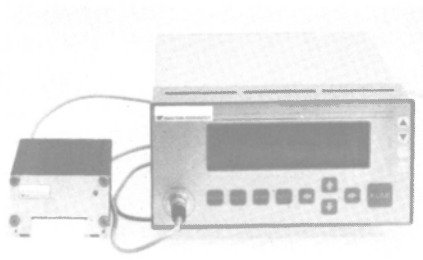
New Fuel Consumption Monitoring System From Kockumation

—Literature Available—

TransTema Kockumation, in conjunction with in-service trials organized by TransConsultants, the consulting subsidiary of Rederi AB TransAtlantic, has developed the new fuel consumption monitoring system, Fuelmaster.

Now available, the Fuelmaster uses the concept of comparing consumption against a number of operational variables. From the unit's display and printed output, it is easy to identify the value of any chosen parameter that gives the least consumption value. A further advantage of this approach is that accurate calibration of the readout is not essential for valuable results to be achieved—a relative improvement in the figures will lead to significant fuel savings.

The Fuelmaster is said to be particularly effective in maximizing performance through such parameters as optimum trim, draft, wave encounter and squat effect. For example, to identify the optimum trim condition for a given vessel, the ship's master would record consumption figures for the effect of different trims in all kinds weather conditions. From the results, the optimum value can be identified. Similarly, the effects of changes in draft and of entering shallower water,



with resultant squat, can be assessed and the best values of draft and speed selected.

The Fuelmaster unit can be arranged to intake up to eight individual inputs—speed, course, draft, specific fuel consumption, etc.—and acts as a processor of these inputs in a number of appropriate ways so as to disply information that is essential for improved fuel economy.

According to Kockumation, the trials of Fuelmaster administered by TransConsultants aboard TransAtlantic vessels have shown excellent results both in fuel savings achieved and in the ease with which the equipment can be used by the crew.

For further information and free literature on the Fuelmaster,

Circle 58 on Reader Service Card

Stable Offshore Platforms Planned By Navy For Aircraft Training Exercises

Small stable semisubmersible platforms, moored at deep-ocean sites, are essential to the development of advanced range facilities for the training of Navy combat pilots and air crews. The platforms will accommodate electronic instrumentation and antennas that relay data compiled during training exercises to shoreside installations.

In compliance with more stringent federal noise pollution regulations, the Navy intends to locate future Tactical Aircrew Combat Training systems 50-60 miles off the U.S. East and West Coasts. Operational platforms are planned for a range off the coast of southern California, and are also proposed for the expansion into deep water of an existing range, already located in shallow water off the coast of North Carolina.

Toward that goal, the Naval Civil Engineering Laboratory (NCEL) in Port Hueneme, Calif., has successfully installed the first large-scale model test platform in 2,910 feet of water off the coast of southern California; this platform has been identified as a suitable concept for range applications. The NCEL has initiated a research and development program to provide the technology necessary to design the required platforms.

By 1989, the NCEL expects to deliver validated models and techniques to its sponsor, the Naval Facilities Engineering Command, for use by the Ocean Engineering and Construction Project Office in the design and installation of small semisubmersibles capable of surviving in severe ocean environments.

Vice Adm. Moranville New Commander Sixth Fleet

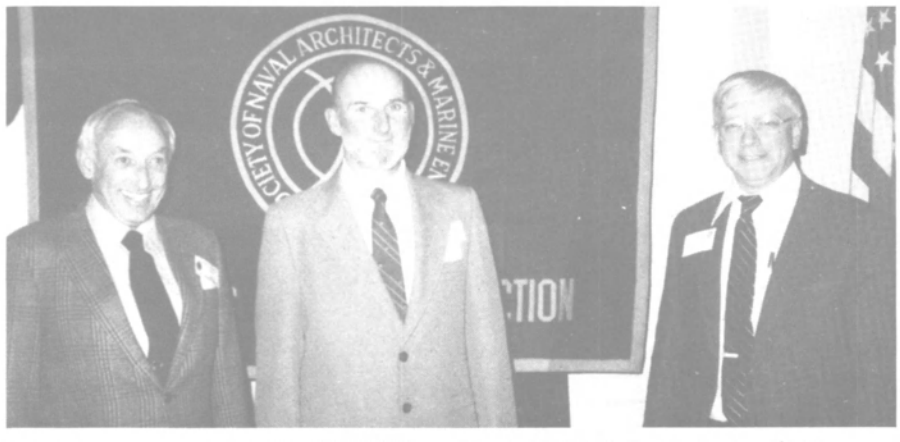
Secretary of Defense **Caspar W. Weinberger** announced recently that the President has nominated Vice Adm. **Kendall E. Moranville,** U.S. Navy, for reappointment to the grade of vice admiral and assignment as Commander Sixth Fleet. Admiral **Moranville** is presently serving as Commander Third Fleet.

Gear Rating Discussed At Joint Meeting Of ASNE And SNAME Sections

The Pacific Northwest Section of The Society of Naval Architects and Marine Engineers, together with the Puget Sound Section of the American Society of Naval Engineers, held their annual joint meeting recently at the Officers Club of the Puget Sound Naval Shipyard in Bremerton, Wash. A technical paper entitled "A Summary of Gear Rating Practices" was presented by **Paul H. Diehl**, a member of the SNAME Section.

The author compared gear rating methods from two marine classification societies, and compared them to two industrial gear standards. Rating results from the four methods were compared on three different marine gear examples that have had a history of gear tooth distress. The causes of tooth distress were discussed in relation to the rating methods, and how the same problems might be avoided in future applications.

The presentation included slides showing various gear trouble-shooting problems.



Principals at recent joint SNAME/ASNE meeting included (L to R): **Parker C. Emerson**, chairman of the Pacific Northwest Section, SNAME; **Paul H. Diehl**, author; and **Michael Terry**, chairman, Puget Sound Section, ASNE.

The Assertive will join the eight other T-AGOS already delivered by Tacoma Boat.

Tacoma Boat Launches Ocean Surveillance Ship For Navy's MSC

Tacoma Boatbuilding Company (TBC) in Washington recently launched on schedule the USNS Assertive (T-AGOS-9), the ninth in a series of ocean surveillance ships designed and built by TBC for operation by the Navy's Military Sealift Command.

Speakers at the launching ceremony included **Paul A. Schneider**, executive director of the Amphibious, Auxiliary, Mine Sealift Ship Directorate; and **L. Wayne Arny III**, principal deputy assistant secretary of the Navy (shipbuilding and logistics). Mrs. **Sydney Arny** was the sponsor of the vessel.

The Assertive has an overall length of 224 feet, beam of 43 feet, displacement of about 2,300 tons, and full-load draft of 15 feet. Propulsion will be provided by a diesel-electric plant. Four Caterpillar/Kato D398B, 600-kw diesel generators feed through a General Electric switchboard, with any two of the four used to drive two GE DC motors that produce 1,600 shp for propulsion.

Each T-AGOS ship will have a complement of 19 to operate the vessel and 10 technicians to operate the sophisticated acoustic surveillance gear. The ships will be used primarily for the low-speed towing of a highly sensitive listening device utilized to gather data which will then be transmitted to shoreside processing facilities for evaluation. The ship's propulsion plant is specifically designed to radiate an absolute minimum of noise while towing the acoustic array.

The Assertive will eventually join the eight other T-AGOS already delivered by TBC. They are the Stalwart, Contender, Vindicator, Triumph, Assurance, Persistent, Indomitable, and Prevail.

Tacoma Boat operates three shipyards, including a repair facility in Tacoma. The company designs, builds, and repairs high-technology, high-performance vessels for the Navy and Coast Guard, as well as for foreign governments and domestic commercial customers.

For full information on Tacoma Boatbuilding's facilities and capabilities in building high-tech military and commercial vessels,

Circle 47 on Reader Service Card

Baldt Marks 85th Year As Major Supplier To Marine/Offshore Industries

This year marks the 85th anniversary of Baldt Inc. of Chester, Pa., a leading supplier of anchors, chains, related marine hardware, and mooring release systems. The company evolved over the years from a manufacturer of chain and anchors, whose credits include supplying the first WWII Liberty ship with DiLok chain, to a broad-based marine supply company. Current products include an award-winning mooring release system designed for offshore oil rigs.

Founded in 1901 as the Baldt Anchor Company, maker of cast steel anchors, the company established itself as a dominant force in the marine industry in 1925 when it acquired the sole commercial license to manufacture and market forged DiLok chain. In the 1930s the company initiated production of specialized forgings.

The war years of the early 1940s were a period of rapid growth for Baldt as military demands for anchors, chain, and hardware reached an all-time high. During this time the Patrick Henry, first of the Liberty ships (built at Bethlehem's Fairfield yard), was equipped with a Baldt stockless anchor and DiLok steel anchor chain.

Baldt's emergence as a major supplier to the offshore drilling industry dates back to 1954, when the company filled a Humble Oil order for more than 25 miles of 2-inch DiLok chain. In 1971, Baldt received its biggest order from Sedco, Inc. of Dallas for 40 miles of 3-inch ORQ stud link chain. This was specified for five of Sedco's semisubmersible drilling rigs destined for the North Sea.

Baldt's most recent response to the demands for massive mooring systems to hold various types of offshore rigs in place is a series of sophisticated rapid-release systems that allow rig operators to free a vessel from its moorings instantaneously if danger threatens. This system, called Moor-Free II , incorporates a unique disconnecting link that detonates when activated by an acoustic transducer. Moor-Free II was recently granted certification by Det norske Veritas, the Norwegian classification society.

For complete information and free literature on the Baldt product lines,

Circle 19 on Reader Service Card

Gould Names Colangelo VP And Controller

Larry A. Colangelo has been promoted to vice president and controller of Gould Inc.'s System Protection Division.

He will be responsible for the division's financial organization, including accounting, management information systems and contracts.

Mr. **Colangelo** has held numerous positions at Gould since joining the company in 1979. He is a graduate of Glassboro State College and holds an MBA in finance from Xavier University in Cincinnati, Ohio.

Gould Inc. designs, develops and manufactures computer and electronic products and systems used in defense, industrial and scientific applications.

The Detroit Diesel-powered Harry Newell.

Workboats Northwest Yard Delivers High-Speed Fireboat To Ketchikan

Ketchikan, Alaska, a city "five miles long and two blocks wide," in the words of one area firefighter, has acquired a new, 30-knot fireboat capable of covering that expanse. The Harry Newell, named for the only member of the Ketchikan Fire Department to lose his life in the line of duty, was duty, was delivered recently by Workboats Nrothwest, Inc. of Seattle. It has barged north where it was christened at the city built on a narrow shelf along the Inside Passage in Southeast Alaska.

The all-aluminum Newell culminates a more than three-year effort by Ketchikan to replace a well-used, 65-foot wooden fireboat, which despite its 4,000-gpm pumping capacity, was deemed too slow to serve the city. Ketchikan has been expanding at each end because of the lack of building space on the precipitous mountains along the Passage. A substantial portion of the city is built on piers, another reason to have a fast, highly capable fireboat.

With an overall length of 45 feet and beam of 12 feet, the new fire/rescue boat has a pumping capacity of more than 5,000 gpm through four fire monitors. Propulsion is provided by two Detroit Diesel 6-71 TI turbocharged and intercooled engines, each developing 410 bhp, powering the boat via Twin Disc 509 reverse/reduction gears at a top speed of 30 knots. Main engines were supplies by Pacific Diesel of Portland. The builder supplied the bow thruster.

United Fire Service of Issaquah, Wash., supplied the firefighting package. Water pressure is provided by four American 1250 pumps. An Elkhart monitor atop the cabin delivers 2,500 gpm; an Akron monitor at the bow delivers 1,000 gpm; and two Akron stern monitors each are capable of throwing 750 gpm. United Fire also supplied the AFFF foam system.

The Prop Shop of Lynnwood, Wash., supplied the 26- by 31-inch, four-bladed, stainless steel propellers. The 2¼-inch shafts were machined by V.M. Dafoe Machine Shop of Vancouver, Canada. Steering systems and controls are by Wagner, supplied by Wm. E. Hough of Seattle; Morse supplied the engine controls. Sea Glaze, also of Vancouver, and Sandy's Glass of Seattle supplied windows. Electronics supplied by Northern Marine Electronics of Seattle include a Furuno 2000 radar and a Sitex FL5 depth sounder.

The Harry Newell is similar in construction to the Williams, a 45-foot fireboat that has served the City of Portland since delivery by Workboats Northwest in 1984. The yard also recently delivered a smaller firefighting boat to Sand Point, Alaska. Currently under construction are several fire and pollution control boats.

For further information, including free literature on the facilities and services offered by Workboats Northwest,

Circle 53 on Reader Service Card

HARRY NEWELL
Major Suppliers

Main engines (2)	Detroit Diesel
Reduction gears	Twin Disc
Propellers	The Prop Shop
Shafting	Dafoe Machine
Bow thruster	Workboats Northwest
Steering system	Wagner
Engine controls	Morse
Filters	Racor
Fire monitors	Akron (3); Elkhart (1)
Discharge valves	Akron
Foam system	United Fire
Warning lights	Whelen
Windows	Sandy's Glass; Sea Glaze
Fendering	Johnson Rubber
Hatches	Freeman Marine
Radar	Furuno
Depth sounder	Sitex
Spotlight	Carlisle & Finch

SI Introduces 'First Family' Of Survival/Exposure Suits —Free Literature Available

Survival International, Inc. (SI) of Seattle, Wash., is offering free new literature on its "First Family" of survival/exposure suits that have been introduced for the 1986 year. The firm is said to be the only company that produces a complete line of such products to fit infants, toddlers, children and adults.

SI found that many commercial fishermen and maritime fleet officers have families aboard, and there is also the recreational boating family, all who require the best in safety equipment. As a result, the company produces a complete "family of exposure suits," confirming, the literature states, its commitment to customers to provide the best possible line of products to meet their needs.

The well-illustrated 1986 catalog describes the various exposure suit types, pointing up standard and special features, along with listing suit sizes, etc. It also describes several other products the company produces in its total survival/rescue line.

Survival International has a number of dealers and distributors throughout the United States and overseas where the entire line of products can be purchased.

For free literature containing full information,

Circle 34 on Reader Service Card

People's Republic Acquires Tung's Euroasia Dockyard

Euroasia Dockyard in Hong Kong has been acquired from the Tung Group by the Peking-controlled China Merchant Steam Navigation (CMSN) for some HK$170 million (about $21.7 million). The Hong Kong facility has been traditionally involved in rig building. It is located on Tsing Yi Island adjacent to existing Chinese-controlled shipyard facilities.

Prior to completion of the deal, it was necessary for the Tung Group to acquire the one-third ownership held by Chung Wah Shipbuilding, and then sell the entire company to CMSN.

China had previously gained rig-building experience from a joint venture with Far East Levingston of Singapore.

The Hatch Tide's maneuverability was increased by the addition of a 550-hp Schottel bow thruster.

Tidewater Marine Upgrades Another Towing/Supply Vessel At McDermott

Tidewater Marine Services, Inc. of New Orleans, the marine subsidiary of Tidewater Inc., has announced the major upgrading of its towing/supply vessel Hatch Tide by McDermott Shipyards in Morgan City, La., for service in the deepwater Gulf of Mexico as industry conditions improve and drilling resumes in this area of activity.

"The modification, which cost approximately $1 million, underscores the needs of our customers and characters for larger, more versatile equipment in potentially promising domestic drilling areas," said **Richard M. Currence,** president of Tidewater Marine and senior vice president of the parent company. The Hatch Tide joins two other Tidewater vessels, the Doc Tide and Darol Tide, that were upgraded recently.

The Hatch Tide was lengthened from 200 to 216 feet, and liquid mud capacity to 2,200 barrels was added. Four additional chain lockers were fitted below deck to accommodate the anchoring needs of larger drilling rigs.

A bigger, 550-hp Schottel S-300-L bow thruster was added to enhance the vessel's maneuverability at sea and in port and harbor areas. Towing capacity was also increased, and a Fritz Culver 25,000-pound line pull tugger used in anchor-handling operations was added. To assist in anchor handling, a Triplex H-300-S "shark jaw," an automatically operated grasping device that controls chain or cable, was installed.

Other modifications include the addition of a more powerful Fritz Culver/Brattvaag towing winch equipped with chain handlers and having a line pull capacity of more than 400,000 pounds. Wire storage reels with a central power source were also added. The addition of 16 feet to the vessel's length increased its speed from 13 to 15.5 knots.

Propulsion is provided by the original twin GM Electro-Motive Division 16-645-E7B diesel engines with a total output of 6,140 bhp, driving two propellers via Reintjes reduction gears.

The Hatch Tide was built in 1982 by Halter Marine's Lockport, La., yard to provide a full range of services to international oil companies and offshore drilling contractors.

In addition to owning and operating one of the world's largest fleets of vessels supporting the offshore oil and gas industry, Tidewater is also active in oil and gas exploration and production, and in the air and natural gas compression business, as well as real estate and insurance.

For further information and free literature on Tidewater Marine Service,

Circle 61 on Reader Service Card

For complete details on the facilities and services provided by McDermott Shipyards,

Circle 62 on Reader Service Card

Yard Patrol Craft launched at Marinette Marine Corporation. In the background, one of the 10 Torpedo Weapons Retrievers (TWRs) under contract to NAVSEA.

Marinette Marine Launches First In Yard Patrol Boat Series

Marinette Marine Corporation of Marinette, Wisc., recently launched the YP 683 first of the 20 Yard Patrol boats under contract to the Navy's Naval Sea Systems Command. This YP was the first wood-hull vessel launched at the Marinette yard since 1943 when the company launched the 192-foot white pine barges for the U.S. Maritime Commission, the yard's first contract as a shipbuilder.

The Yard Patrol boats have a wood hull and aluminum superstructure. They have an overall length of 108 feet, beam of 22 feet 9 inches, and full-load draft of 5 feet 9 inches. These YPs will be used by the Navy at the Naval Academy in Annapolis for instruction in seamanship, navigation, and marine engineering disciplines.

The YPs are being built beside two Mine Countermeasure (MCM) ships, also under contract to NAVSEA, in Marinette's 70,000-square-foot, 95-foot-high Ship Erection Building that was specifically built for construction of wood-hull vessels. The massive building permits complete outfitting in an environmentally controlled atmosphere, allowing vessels to be nearly complete when moved outside for launching.

The YP 683 was 95-percent complete when launched on the yard's 200-ton shiplift, a movable docking platform capable of launching and retrieval of vessels up to 120 feet long and 200 tons displacement.

The original contract for six YPs was awarded to Marinette Marine by NAVSEA in August 1984. In December of the same year, a modification to the original contract was awarded to Marinette for seven additional YPs, and in September 1985 another option was exercised for seven more vessels, bringing the total contract to 20 boats.

Now in its 44th year of operation, Marinette Marine is well-known for its versatility in the design and construction of government and commercial vessels of all types.

For further information on Marinette Marine's yard services and facilities, including free detailed literature,

Circle 44 on Reader Service Card

YARD PATROL BOAT YP 683
Major Suppliers

Main engines (2)	Detroit Diesel
Reduction gears (2)	Twin Disc
Propellers (2)	Columbian Bronze
Anchor windlass	New England Trawler
Radars	Raytheon
Loran C & plotting system	Epsco
SatNav/Omega system	Magnavox
Gyrocompass	Sperry
Generators (2)	Detroit/Int'l Electric
HF/VHF	Harris
VHF	Intech
UHF	Rockwell Int'l

Captain Wages Joins MSI As Director Of New Simulator Training Center

Capt. **C.J. (Jerry) Wages**, USN (Ret.) has joined MarineSafety International, New York, N.Y., as director of a new simulator training center to be established at Newport, R.I., for senior and intermediate level line officers attending the U.S. Navy's Surface Warfare Officers' School (SWOS) at Newport. Construction of the new complex began this summer at the Aquidneck Industrial Park, a few miles from the Navy base.

The Navy has awarded MarineSafety a contract to train as many as 1,200 officers annually at the new center. The simulator courses will permit trainees to gain experience in handling any type of combat or support ship in any body of water or port in the world. Exercises will cover the full range of ship maneuvers from getting underway to docking. The simulators permit conditions such as wind, current and visibility to be controlled. Training can include missions and maneuvers conducted in coordination with other ships as well.

Joining the Navy as an enlisted man during the Korean War, Captain **Wages** had more than 26 years of active duty including several sea commands and key training assignments, three years in the U.S. merchant marine, and five years in civilian maritime industry.

For the past five years, he was logistics support manager (manpower, personnel and training) for Bell Aerospace Textron in New Orleans. This followed a year as Chief of Staff to the Chief of Naval Reserve, after a year as Commander, Naval Reserve Readiness Region 10.

MarineSafety International is a subsidiary of FlightSafety International, a leading aircraft, marine and power plant training organization. At present, MarineSafety trains more than 300 merchant marine officers a year at a multi-simulator training complex located at the LaGuardia Airport Marine Air Terminal in New York.

For further information, including complete detailed free literature on MarineSafety courses and facilities,

Circle 30 on Reader Service Card

Magnus Maritec Named Exclusive Marine Supplier Of Ethysorb products

London-based Stay Fresh Ltd., manufacturer of Ethysorb®, the remarkable "life extender" of fresh produce, has announced a major worldwide distributor agreement with U.S.-based Magnus Maritec, a subsidiary of Economics Laboratory Inc., to supply the merchant marine and offshore industry with Ethysorb products.

Stay Fresh sales director **Bernard Mitchell** commented, "This means Ethysorb protection for fresh produce stored on-board ships will soon be available in virtually every major port throughout the world." Managing director **Tony Lenahan**, who signed the agreement with Magnus Maritec International president **Jack Finnegan**, added: "Major international shipping lines traditionally supply their crews and passengers with top-quality fresh fruit and vegetables. Now, with Ethysorb protection available, they can buy more economically and at the same time significantly reduce their waste factor in this important cost area."

For further information and a free color brochure on Ethysorb,

Circle 17 on Reader Service Card

Newfoundland-Sweden New Joint Venture Company

In order to meet the long-term needs of the petroleum industry more effectively and provide a broader service base, SeaForest Holdings Limited of Newfoundland, through its subsidiary, NORDCO Limited of St. John's, and Gotaverken Arendal Canada Ltd., a subsidiary of Gotaverken Arendal AB of Sweden (GVA), have announced the formation of a joint venture company aimed at a mutual exchange of offshore-related expertise and technology.

The new company, to be known as FloatEng Ltd., has been formed to assist in the development, production and marketing of floating platforms and modular systems. With its proven technical ability and high professional standards, FloatEng will be able to provide wide-ranging developmental and construction assistance to all phases offshore Newfoundland.

According to **Frank Smith,** chairman of SeaForest and president of NORDCO, and **B-G Renborg,** president of GVA Canada Ltd., the increased resources and enhanced potential for diversification provided by the new association will offer better opportunities in an increasingly competitive market.

The members of FloatEng bring considerable expertise in offshore projects to the venture—SeaForest through NORDCO's record in marine engineering and technology, ice management, electronic instrumentation design and maintenance, remote sensing, and other support services to the offshore; and GVA with its high-tech experience in drilling, production and service platforms acquired through feasibility studies, conversions, and in turn-key based delivery of over 20 Offshore Units designed, engineered and built within GVA's own facilities.

Both GVA and NORDCO have been active in the initial Hibernia studies, and plan to continue major involvement in future offshore Newfoundland developments.

For full information on the new joint venture,

Circle 56 on Reader Service Card

B-G Renborg (left), president of GVA Canada Ltd., and **Frank Smith,** chairman and chief executive officer of SeaForest and president of NORDCO Limited, sign papers creating the new FloatEng joint venture.

Lechler Now Executive VP Of Sumitomo Machinery

William Lechler

William M. Lechler, formerly vice president sales and marketing of Sumitomo Machinery Corp. of America, Teterboro, N.J., has been promoted to executive vice president and chief operating officer.

Mr. **Lechler** replaces **Nick Yamazaki**, formerly vice president and chief operating officer, who has been promoted to president. In his new position, Mr. **Lechler** is responsible for directing all company operations, including product design and development, manufacturing and marketing and sales.

Carrier Receives ABS Certification —Literature Available

The ABS (American Bureau of Shipping) recently announced that it has awarded approved design type certification to Carrier Transicold Division of Carrier Corporation for the compressors that they use in the manufacture of marine refrigeration and air conditioning equipment.

This is the first time ABS certification of this type has ever been awarded to a manufacturer of refrigeration and air conditioning compressors.

The refrigeration and air conditioning compressors will be listed in the ABS List of Approved Equipment.

Although ABS certification from Carrier Transicold was available in the past, it is now available without having to wait for design approval and in-house audits to take palce.

For free literature and more information on Carrier marine equipment,

Circle 28 on Reader Service Card

Bender Gets $9.67-Million Navy Contract To Overhaul Dock Landing Ship LSD-32

A U.S. Navy contract valued at $9.67 million has been awarded to Bender Shipbuilding & Repair Company of Mobile, Ala., for the overhaul of the dock landing ship USS Pensacola (LSD-32).

At its peak, the conversion work is expected to provide some 160 jobs at the Mobile yard. It is scheduled to begin in late August this year and be completed nine months later.

Ward Leonard Electric Offers Free 10-Page Push Button Catalog

Ward Leonard Electric Co. Inc., Mount Vernon, N.Y., has published a new 10-page catalog that details a complete line of push buttons.

Catalog No. 19, "Ward Leonard Push Buttons," consists of five sections that cover Series WF ⅞-inch (22 mm) Operators and Pilot Lights (miniature); Series WC 1 13/64-inch (30 mm) Operators and Pilot Lights (standard); Contact Blocks; Accessories and Replacement Parts; and Dimensions. The publication highlights product features and details the wide range of operator tops, color options and accessories that are available.

Tabled information includes data on selector switch combinations and contact block/operator top compatibility. Complete diagrams detail the dimensions of operators, blocks and enclosures.

The catalog is neatly laid out in a simple, uncluttered style for easy reference and includes excellent photographic illustrations of products that are listed.

For your free copy of Catalog No. 19 from Ward Leonard,

Circle 24 on Reader Service Card

PROPULSION UPDATE

Hydrostatic Drives Propel Many New 'Old-Time' Paddlewheelers

Sternwheeler Betsy Ann, converted to an excursion vessel in 1982, is powered by two Hagglund hydraulic motors driven by hydraulic pumps/diesel engines.

High-torque, low-speed hydraulic motors are being used on many paddlewheel vessels all over the world. This form of propulsion transmission and its benefits would appear to be attractive in other applications also.

Hydrostatic drives are by no means new for propulsion transmission on paddleboats. One of the first installations goes back to 1972 on a passenger vessel on the Bavarian Lake in Germany. That craft's original steam engine was replaced by two 230-hp Hagglund hydraulic drives. Similar projects have been realized in Italy, Australia, the Netherlands, and especially in the U.S.

A count of the existing hydrostatic-powered paddleboat fleet in the U.S. shows about 20 installations. They all rely on Hagglund high-torque, low-speed hydraulic motors, which are particularly favorable in this area. The majority of these vessels are newbuildings designed for the growing industry of "nostalgic cruises." The promoters of these ventures have revitalized the old traditions and awakened memories for many senior citizens.

Potomac River Boat Company's Cherry Blossom went into service in 1984 as the first paddleboat on that Washington, D.C. river in almost 40 years. She was built by Offshore Shipbuilders in Palatka, Fla., a company that also delivered the 125-foot sidewheeler Andrew Fletcher. Operated as an excursion vessel by Seaport Line in New York Harbor, she is said to be the first large sidewheeler built in the U.S. in the past 60 years. Offshore Shipbuilders have plans to construct three more hydrostatic-powered paddleboats.

Marine Power, Inc. in Florida, a firm owned by naval architect **William G. Preston,** is well known in the paddleboat field, and has designed more than 10 hydraulic-driven sternwheelers to date. The firm is optimistic about further similar projects. Their largest existing paddlewheeler is the 100-foot Landing Queen, operating on Lake Conroe, Texas. She was built in sections by Walker Marine at Moss Point, Miss., and assembled on the shores of Lake Conroe. Marine Power is currently working on a 132-foot sternwheeler, the Discovery III, for Alaska River Ways, Inc.

Sidewheeler Andrew Fletcher, built by Offshore Shipbuilders in Palatka, Fla., is operated by Seaport Line as excursion vessel out of South Street Seaport in New York.

LaCrosse Riverboat in LaCrosse, Wisc., another specialist in paddleboats, has so far built 10 sternwheelers. The largest is the 125-foot Tahoe. Four more sternwheelers are currently in the design stage; all will be hydraulically powered.

Like many sternwheelers, the Betsy Ann has a split paddle to assist steering. Steering is further improved with two go-ahead and two back-up rudders. Each of the vessel's 240-bhp diesel engines, operating at 1,100 rpm, drives a variable-volume, pressure-compensated hydraulic pump. Each pump powers a torque-arm-mounted Hagglund hydraulic motor.

High-torque, low-speed hydraulic motors or radial piston design are of course applicable in many other types of machinery where similar conditions are encountered. The hydrostatic transmissions offer the following benefits: Efficient torque-limiting by relief valves; smooth, easy speed control from zero to maximum; easy reversing; high torque/inertia ratio, low time constant; easy adoption to feedback control systems; freedom to place the prime mover in any suitable space; and simple installation.

Compared with high-speed type hydraulic motors, the Hagglund motor offers higher starting torque efficiency and elimination of reduction gears. Because of the low-speed capability, this also means faster acceleration, quicker reversing, and lower noise level.

Hagglunds' hydraulic motor design is particularly well suited for the power ranges concerned—up to 750 hp at 20 rpm per motor. It hydromechanical efficiency is extremely high and it has a reliable low-speed performance, even at 0.5 rpm or less.

With a high external load capacity, the Hagglund hydraulic motor can be mounted in a bracket or with a torque arm arrangement. The motor is also easily adapted to the drive shaft, with no welding or keyways necessary.

Hagglunds foresees a continuing demand for high-torque, low-speed hydrostatic drives for propulsion applications, not only in such "exotic" cases a paddleboats but also for thrusters, silent propulsion systems, subsea vehicles, and many other demanding applications.

For further information and free brochures on the Hagglund hydrostatic drives,

Circle 59 on Reader Service Card

Todd Shipyards Relocates Corporate Headquarters To Jersey City, N.J.

Todd Shipyards Corporation, one of the nation's leading ship construction and repair companies, has moved its corporate headquarters from Manhattan to One Evertrust Plaza, Jersey City, N.J. 07302. The company's corporate staff of some 80 people will occupy the eighth and part of the ninth floors, about 25,700 square feet, under a 15-year lease. Todd was the first tenant to move into the new high-rise building, which is located near Exchange Place.

Todd operates shipyards in or near Seattle, San Francisco, Los Angeles, and Galveston, Texas. Its recently acquired Aro subsidiary is an international manufacturer of industrial air-powered equipment, including tools, and aeronautical life-support products and environmental services.

The new telephone numbers for the New Jersey office are: (201) 434-0200 and (212) 668-4700; telex WUI 620100.

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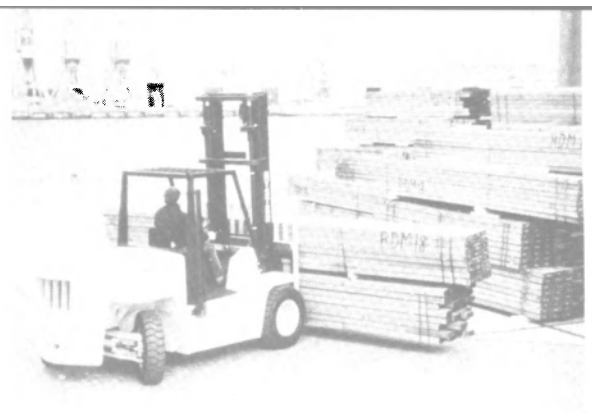
Hyster Expands XL Line Of Lift Trucks—Literature Offered

The Hyster Company of Danville, Ill., has announced the expansion of its versatile XL line of lift trucks with the addition of seven new models in the Challenger 70-110XL series and the Challenger 135-155XL series. The Challenger 70-110XL series will offer lift trucks with capacities ranging from 7,000 to 11,000 pounds and the Challenger 135-155XL series will offer trucks with 13,500- and 15,000-pound capacities.



One of the Hyster Challenger XL Series lift trucks

These new models are currently the highest capacity trucks in the growing XL lift offering, expanding the capacity range for the XL line from 2,500 pounds to 15,000 pounds.

All seven models in the two new series are designed and manufactured by Hyster Company to offer customers greater benefits, reliability and economy. They are well-suited for tough handling jobs in the paper, metal, timber, marine cargo and building materials industries.

For free literature, including a detailed brochure on the new Challenger XL lift trucks from Hyster,

Circle 36 on Reader Service Card

Conrad Shipyard Delivers Unique Drydock To Republic Of Venezuela

The submersible barge/drydock Rio Manzanares designed and built by Conrad Industries, Inc. of Morgan City, La., for the Republic of Venezuela, left the port recently under tow to its South American home port of Guanta. The unusual vessel was accepted on behalf of Venezuela by Capt. **Jesus Enrique D'Paola,** naval director of the Instituto Nacional de Canalizaciones (INC). Breaking the traditional bottle of champagne that trailed streamers of yellow, blue, and red (Venezuela's national colors), Mrs. **D'Paola** sponsored the vessel.

Classed by the American Bureau of Shipping +Al Ocean Service, Submersible Barge/Drydock, the Rio Manzanares is the first vessel of its kind built utilizing a new Conrad concept. In the transportation mode, the 180- by 64-foot vessel that measures 52 feet 6 inches between wingwalls is capable of carrying 1,100 tons. In the drydock mode, it can handle 1,800 tons. This barge/drydock, with 18-foot-high wingwalls 5 feet 9 inches thick, will be used by the INC of Venezuela to transport suction and hydraulic dredges and various other waterway maintenance equipment in open sea conditions.

Built into the wingwalls that run the full length of the vessel is a generator room housing a 150-kw Caterpillar diesel generator. The wingwalls are also used for fuel storage, and each of the 12 watertight compartments is fitted with its own electrically driven pump for deballasting. Four of the Louisiana-manufactured Lo-Lift pumps have a capacity of 1,400 gpm; the other eight are rated 1,000 gpm. The 8-foot-deep pontoon section, raked at both ends, is fitted with skegs on the stern.

Conrad Industries, founded by **J. Parker Conrad** in 1948, has gained a place in the international market through innovative designs in building vessels that can be used for multiple purposes. The company specializes in steel barge and drydock construction, boat and barge repairs, vessel conversions, sandblasting and painting, machine shop operations, and propeller reconditioning. Its 2,400-ton drydock accommodates vessels up to 220 feet long. Additional drydocks include two with 900-ton capacity and one with 2,000-ton capacity.

For further information on Conrad's facilities and its design and construction capabilities,

Circle 35 on Reader Service Card

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(continued from page 34)

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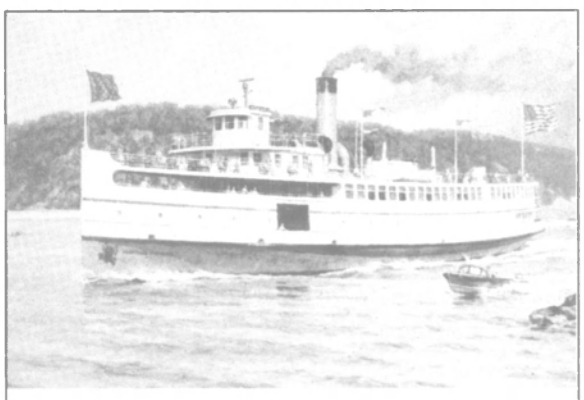

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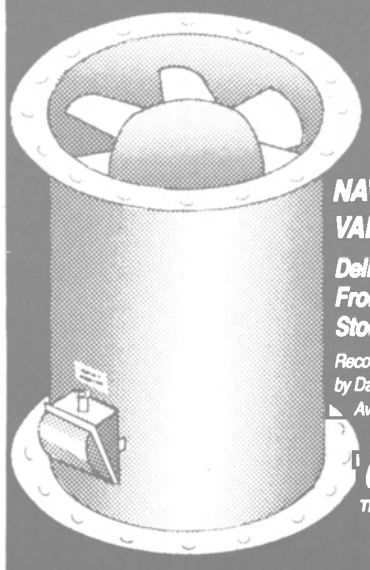

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ELECTRONICS UPDATE

Shipmate's RS-6100 Navtex Receiver

—Literature Available—

As another element of safety of vessels at sea, all ships of more than 300 grt must be equipped with one of the relatively new Navtex receivers by February 1, 1990. Navtex is a 24-hour warning system that transmits a broad range of navigational and weather information relevant for all types and sizes of ships.

In the U.S., Navtex coverage already exists in New England and the Gulf of Mexico. The Coast Guard expects to have national coverage in place by the end of 1989. Shipmate is keeping on top of these developments by offering a new and advanced Navtex Receiver.

The RS-6100 Navtex receiver from Shipmate has only four control keys to insure simple, reliable operation. All additional functions are performed via a printed menu that describes required operator responses. It provides the full range of weather and safety information automatically with free choice of transmitter stations. The RS-6100 also features a "silence" function so that the latest and most relevant information may be printed at the convenience of the operator. Both the paper and the keyboard are illuminated for easy nighttime operation and an internal battery protects stored data for as long as five years. The RS-6100 consumes very little power, having an economy function in which it only uses 1W. When connected with one of Shipmate's navigation receivers, for example RS-4000, RS-5000 Sat Nav, or RS-5100 Sat Nav, the RS-6100 serves as a printer and prints out information from the navigator's display or satellite predictions from the satellite navigators. The printer will also interface with any other NMEA compatible navigation receiver.

There are three versions of the RS-6100 series: RS-6100 Automatic where area selection is automatic

when connected to a navigation receiver; RS-6101 Basic where area selection is carried out manually; RS-6150 is a printer only which can be connected to navigators, computers, or other equipment requiring a print-out.

Other features include built-in audible and visual alarm, end-of paper alarm, along with an easy touch keyboard with light and dimmer and a 40-character thermal printer with 131-foot paper capacity.

The RS-6100 is ruggedly constructed of impact-resistant polycarbonate and may be mounted in virtually any convenient location. A snap lock enables quick removal, a great feature for smaller yacht owners.

For further information on Shipmate's RS-6100 Navtex Receiver,

Circle 57 on Reader Service Card

Vice Adm. Kelso Named Commander In Chief, Atlantic Fleet

Secretary of Defense **Caspar W. Weinberger** announced recently that the President has nominated Vice Adm. **Frank B. Kelso II,** U.S. Navy, for appointment to the grade of admiral and assignment as Commander in Chief, U.S. Atlantic Fleet/Deputy Commander in Chief, U.S. Atlantic Command. Admiral **Kelso** is presently serving as Commander Sixth Fleet.

Petrojarl I was recently completed at the Tsurumi Works of Nippon Kokan in Japan.

Offshore Production And Test Ship Delivered By NKK To Norwegian Owner

The Petrojarl I, said to be the world's first purpose-built, floating offshore oil production and testing system, was completed recently at the Tsurumi Works of Nippon Kokan (NKK) in Japan and delivered to K/S Petrojarl A/S. The vessel will enter North Sea service this summer, operated by Golar-Nor Offshore A/S of Trondheim, Norway, a limited partnership consisting of Fearnleys, Gotaas-Larsen Shipping, Laly, and Norcem.

Designed for well testing and early production, the Petrojarl I can operate in water up to 2,132 feet deep and under severe sea and weather conditions. With a dynamic positioning system and eight anchors, it can maintain an optimum heading at all times, while its turret mooring system permits the riser pipe from the well to remain unaffected by any movement from waves, wind, and current.

The vessel has an overall length of 587.4 feet, beam of 105 feet, depth of 50.5 feet, and draft of 39.4 feet. Daily production capability is 30,000 barrels, with storage capacity of 188,000 barrels. Shuttle tankers will transport the oil to onshore terminals at regular intervals.

Electrical power is supplied by four duel-fuel (gas/diesel) turbines, each driving a 2,800-kw generator; two diesel generators, each rated 1,500 kw; and emergency generator in the forward part of the vessel rated 500 kw.

Accommodations for 60 persons are provided in 16 single and 22 double air-conditioned cabins, all with shower and toilet. A helideck above the bow is designed to handle a Boeing 234 Chinook helicopter.

The Petrojarl I will provide testing and recording of reservoir data from one or several wells, for better planning of depletion strategies and permanent production facilities. Early production of larger fields prior to installation of permanent facilities will allow verification of depletion strategies and improved cash flow. Attractive economics, including minimal initial investment, will encourage exploitation of fields that are sub-commercial at present, due to small reserves, hetrogeneities, short production lives, or unproven production characteristics.

The vessel is classed by Det norske Veritas 1A1 Mobile Offshore Unit and also has the additional notation Production and Storage Vessel or Tanker for Oil. It meets the Norwegian Maritime Directorate rules for drilling vessels and the Norwegian Petroleum Directorate rules for production facilities. It also meets or exceeds the applicable regulations of the U.K. Department of Energy, the U.S. Coast Guard, and the International Maritime Organization.

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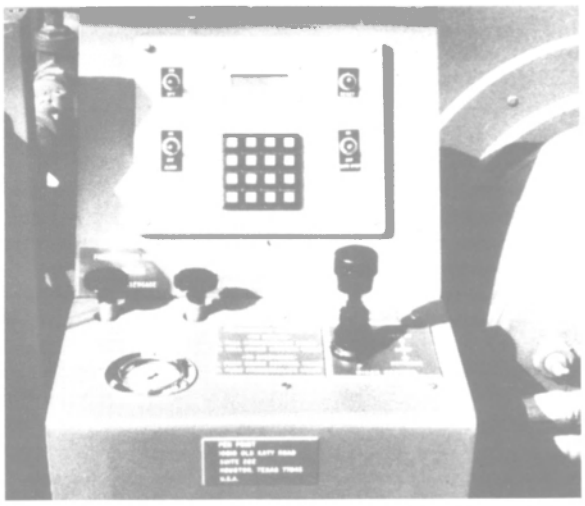
Microprocessor-Based System Monitors/Controls Mooring Lines—Literature Available



Microprocessor-based Load Monitoring/Line Payout System from Remote Systems Technology measures cable tension, line position and speed of mooring lines. Values measured appear on LCD display. Interface with calculation equipment allows control over line position and speed.

A compact, microporcessor-based monitoring system that measures cable tension, line position and speed of submerged mooring lines is available from remote Systems Technology (RST), a subsidiary of Baldt Inc.

The electronic Load Monitoring/Line Payout System indicates values measured on a backlit LCD display and can interface with calculation equipment to control line position and speed. It can be used on ships, barges, drill ships and semisubmersibles, in conjunction with a winch or crane. In situations where line pull stress limits are about to be exceeded, the system can sound an alarm or automatically initiate equipment shutdown.

Examples of equipment affixed to mooring lines include anchors, electronic packages, remotely operated vehicles, and current, temperature and depth meters. System features include an alphanumeric display that guides the user through operating sequences.

The system incorporates 16K bytes of program memory and interfaces with the following inputs and outputs: 4 channels of analog input which can be converted to digital values with 12-bit (1 part in 4096) resolution; 4 input amplifiers for calibration of transducer signals; 8 digital inputs for special function switches and ON/OFF sensors; 4 output relays; 2 analog output channels; 20 position sealed keyboard; and 2 line x 16 character backlit LCD display.

The input channels can be configured to accept load cells, pressure, angular position and linear position transducers; temperature and magnetic flux sensors, and pendulums. Custom configurations are also available to meet specific application requirements.

For further information,

Circle 40 on Reader Service Card

Moss Point Marine Completes Tug For Panama Canal Commission

Moss Point Marine, Inc., Escatawpa, Miss., has completed the all-steel, 105-foot harbor tug, Paz, to the Panama Canal Commission, Republic of Panama.

Original construction was begun by another shipyard which did not complete the vessel due to inclement weather and a decision by its management to concentrate on other forms of shipbuilding.

When Moss Point Marine received the vessel, all systems were aboard, but not connected or tested. The shipyard therefore connected all piping and wiring, aligned the main engines, completed the carpentry and finish work, painted the vessel, and tested all systems.

Built to American Bureau of Shipping (ABS) standards, the Paz is 105 feet in length, with a 30-foot beam, and 15-foot depth. She is powered by two 12-cylinder EMD 645 diesel engines developing approximately 3,000 hp. She is equipped with two Detroit Diesel 671 diesel engines driving two 75-kw generators, and has an electrohydraulic steering control system. Kort nozzles are installed for greater thrust and maneuverability.

She is also outfitted with a 1,500-gpm fire monitor at 150 psi and has a complete rubber fendering system.

The Paz will work within the confines of the Panama Canal and the harbors at Cristobal and Balboa. She will offer assistance to large merchant and naval ships in maneuvering, entering locks, docking and undocking, and in restricted areas close to channel banks. She will also assist grounded vessels, handle floating equipment, and fight fires on water and land.

John Dane III, president of Moss Point Marine, Inc., said the entire project took 45 days to complete. "We are very proud of our work on this boat," he said, "because it is an excellent indicator of our adaptability, versatility, and speed."

For more information and free literature on Moss Point Marine,

Circle 38 on Reader Service Card

New 12-page Catalog On Multi-Port Ball Valves Offered By Pittsburgh Brass

A newly revised 12-page catalog on three-, four-, and five-way multi-port ball valves is now available from Pittsburgh Brass Manufacturing (PBM) of Irwin, Pa. This "Reference Book Section IV" upgrade shows a wealth of engineering data, including C_v charts, pressure temperature curves and materials of construction.

The materials include 316 stainless steel, bronze, weldex, carbon steel and exotic alloys. Sizes range from ½ inch to 4 inches in a wide selection of end connections.

Seventy-three flow patterns are available in single units, and when tandem mounted or manifolded, they offer an infinite number of flow configurations.

All valves incorporate PBM's exclusive adjust-o-seal design, which permits in-line adjustment of seats to compensate for wear.

Among the many drawings in the well-illustrated catalog is an exploded view of a five-way PBM ball valve and a cutaway lettered drawing with corresponding text that gives the anatomy of a PBM multi-port ball valve.

For your free copy of the newly revised 12-page catalog, Section IV from PBM,

Circle 37 on Reader Service Card

BUYERS DIRECTORY

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

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Flakt AB, Box 8862, S-40272, Gothenburg, Sweden
Mechanical Resources Inc., 210 West Side Ave., Jersey City NJ 07305
Stal Refrigeration AB, Butangsgatan 16, S 601 87 Norrkoping, Sweden
United Technologies, Carrier Transicold Division, P.O. Box 4805, Syracuse NY 13221
York International Corp., P.O. Box 1592-361C, York, PA 17405

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Baldt Incorporated, P.O. Box 350, Chester, PA 19016
G.J. Wortelboer Jr. B.V., Eemhavenstraat 4, P.O. Box 5003, 3008 AA Rotterdam, Netherlands

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Tramp Oil & Marine ltd., London ENGLAND. Telex: 8812194

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Pandel Instruments Inc., 2100 N. Hwy. 360, Grand Praire, TX 75050
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Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
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Valmet Automation A.S., P.O. Box 130, N-3430, Spikkestad, Norway

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Illman Jones Inc., 5505 Broadway, American Canyon CA 94589
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637

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Kohlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241

HULL CLEANING
Petroferm Marine, Route 2, Box 280, Amelia Island, FL 32034
Phosmarine Equipment, 21 Bd. de Paris, 13002, Marseille, France
Seaward Marine Service, Inc., 201 N. Union Street, Alexandria, VA 22314
Seaward Marine Service, Inc. 5409 Beamon Rd., Norfolk, VA 23513 TX: 710-881-1182
Seaward Marine Service, Inc. 424 West 8th Street, National City, CA 92050
Taylor Diving & Salvage Co. Inc., 701 Engineers Rd., Belle Chasse, LA 70037

HYDRAULICS
Aeroquip Corp., 1130 Maynard Road, Jackson, MI 49202
Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA. 93116
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Del Gavio Marine Hydraulics Inc., 207 W. Central Ave., Maywood, NJ 07607
Hydra-Dynamics, Inc., 2141 Greenwood Ave., Wilmette, IL 60091
Parker Hannifin Corporation, 17325 Euclid Avenue, Cleveland, OH 44112
Titeflex Corporation, P.O. Box 54, Springfield, MA 01109
Washington Chain & Supply, Inc., P.O. Box 3646, Seattle, WA 98124

INERT GAS
Saab Tank Control, One Harmon Plaza, Secaucus NJ 07094

INSULATION—Cloth, Fiberglass
Bailey, Carpenter & Insulation Co., 2323 Randolph Avenue, Avenel, NJ 07001
Duracote Corp., 350 North Diamond St., Ravenna, Ohio 44266
Superior Energies, Inc. P.O. Drawer 386, Groves, TX 72619

INSURANCE
Adams & Porter Associates Inc., 510 Bering Dr., Houston TX 77057

JOINER—Watertight Doors—Paneling
Advanced Structures Corp., 235 W. Industry Ct., Deer Park, NY 11729
Astech, 3030 S. Red Hill Ave., Santa Ana, CA 92711
Bailey Distributors, Inc., 2323 Randolph Avenue, Avenel, NJ 07001
Masonite Commercial Division, Dover, OH 44622
Walz & Krenzer Inc., 725 Glen Cove Ave., P.O. Box 6, Glen Head NY 11545

KEEL COOLERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
Carlisle & Finch, 4562 W. Mitchell Avenue, Cincinnati, OH 45232
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Perko Inc., P.O. Box 6400D, Miami, FL 33164
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209

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

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL-MARINE
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
Goltens, 160 Van Brunt St., Brooklyn, NY 11231

METAL MARKER
J. P. Nissen Company, P.O. Box 188, Glenside PA 19038

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

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

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Hydromath Inc., Box 2450, Danby-Pawlet Road, Pawlet, VT 05761
American Systems Engineering Corp., P.O. Box 8988, Virginia Beach, VA 23452
Ameritech Corporation, 7 Belver Avenue, Suite 215, N. Kingston, RI 02852
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.D.I. Marine Co., 5520 Los Santos Way, Suite 600, Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829
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
C.R. Cushing, 18 Vesey St., New York, NY 10007
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
Engineering Visions, 1111 Bay Blvd., Chula Vista CA 92011
Capt. R.J. Fearson & Associates, P.O. Box 983, Tampa, FL 33601
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., 40 Exchange Place, New York, NY 10005
Hi-Test Laboratories, Inc., P.O. Box 226, Buckingham C.H., VA 23921
HydroComp, Inc., 10 Cutts Road, P.O. Box 865, Durham, NH 03824
Intramarine, Inc., P.O. Box 53043, Jacksonville, FL 32201
JJH Inc. of Virginia, 330 County St, Portsmouth VA 23704
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
James S. Krogen, 1515 NW 7th St., Suite 124, Miami FL 33125
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
John J. McMullen Associates, Inc., 1 World Trade Center, New York, NY 10048
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, 1010 Turquois St., Ste 217, San Diego, CA 92109
Maritime Design, Inc., 2955 Hartley Rd., Jacksonville, FL 32217
R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003
Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
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
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, FL 33156
Q.E.D. Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St., San Francisco, CA 94105
Sargent & Herkes Inc., 611 Gravier St., New Orleans, LA 70130
Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, FL 33316
SEACOR Systems Engineering Corp., 520 Fellowship Rd., Ste C306, Mt. Laurel NJ 08054
STV/Sonders & Thomas, Inc., 1745 Jefferson Davis Hwy., Arlington, VA 22202
Seaworthy Systems Inc., 28 Main St., Essex CT 06426; 17 Battery Pl., New York, NY 10004; P.O. Box 205, Solomons MD 20688; 2 Skyline Pl, 5203 Leesburg Pike, Falls Church VA 22041
Seaworthy Electrical Systems, 17 Battery Pl. N.Y. N.Y. 10004
George G. Sharp, Inc., 100 Church St., New York, NY 10007
Simmons Associates, P.O. Box 760, Sarasota, FL 33578
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
Thomas Coudon Associates, 6655 Amberton Drive, Baltimore, MD 21227
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
AT&T Communications, 412 Mt Kemble Ave., Room N420, Morristown, NJ 07960
Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080
A/S Elektrisk Bureau, P.O. Box 98, N-1360 Nesbru, Norway
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, 9 Hoyt Drive, Newburyport, MA 01950
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
ITT Mackay, 441 U.S. Highway #1, Elizabeth, NJ 07202
Kongsberg Vopenfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway
Micrologic, 20801 Dearborn, Chatsworth, CA 91311
Naval Electronics, 5479 Jetport Industrial Blvd., Tampa FL 33614
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
Racal Marine Inc., 1 Commerce Blvd., Palm Coast, FL 32037-0029
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-Shipmate, 400 Oser Ave., Hauppauge NY 11788
S.P. Radio A/S, DK 9200 Aalborg, Denmark
SAIT Inc., 33 Rector St., New York, NY 10006
Simrad, 2208 NW Market St., Seattle WA 98107
Sperry Corporation, Rte 29 North, Charlottesville, VA 22906
Telesystems, 2700 Prosperity Ave., Fairfax, VA 22031 USA
Tracor Instruments Austin Inc., 6500 Tracor Lane, Austin, TX 78725

OILS—Marine—Additives
B P North America Petroleum, 555 US Route 1, So. Iselin, NJ 08830
Exxon Company, U.S.A., Room 2323 AH, P.O. Box 2180, Houston, TX 77701
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
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
FAST Systems, Inc., 1717 Sublette, St. Louis, MO 63110
Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND
Marketec, Inc., 27 Bowers Lane, Chatham, NJ 07928
Mitsubishi International Corp., Machinery Div., 520 Madison Ave., New York, NY 10022
NALCO Chemical, Co., 2901 Butterfield Road, Oak Brook, IL 60521
Oil Recovery Systems, Inc., 1420 Providence Hwy., Norwood, MA 02062
Peck Purifier Sales Co., 3724 Cook Blvd., Chesapeake, VA 23323
Sigma Treatment System, Merry Meadows RD 1 Box 70, Chester Springs, Pa 19425

PAINTS—COATINGS—CORROSION CONTROL
American Abrasive Metals Co., 460 Coit St., Irvington NJ 07111
Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754
Devoe Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207
Esgard, Box 2698, Lafayette, LA 70502
Farboil Company, 8200 Fischer Rd., Baltimore, MD 21222
Hempel Marine Paints, Inc., Foot of Currie Ave., Wallington, NJ 07057; 6868 NorthLoop East, Suite 304, Houston, TX 77028; P.O. Box 10265, New Orleans, LA 70181
International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083
Jotun Marine Coatings Inc., 175 Penrod Court N&O, Glen Burnie, MD 21061
Magnus Maritec International Inc., 150 Roosevelt Pl., P.O. Box 150, Palisades Pork, NJ 07650
Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203

PIPE-HOSE—Cargo Transfer Clamps, Couplings, Coatings
Amermarine International, P.O. Box 9205, Dundalk, MD 21222
Ameron Fiberglass Pipe Division, P.O. Box 801148, Houston TX 77280
Hydro-Craft Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063
Knights Piping Inc., 5309 Industrial Road, Pascagoula, MS 39567
Murdock Engineering, P.O. Box 152278, Irving, TX 75015
Tioga Pipe Supply Co. Inc., 2450 Wheatsheaf La., P.O. Box 5997, Philadelphia, PA 19137
Willcox, P.O. Box 484, Garfield NJ 07026

PLASTICS—Marine Applications
Hubeva Marine Plastic, Inc., 390 Hamilton Ave., Brooklyn, NY 11231

PNEUMATICS
Limitorque Corporation, 5114 Woodall Rd., Lynchburg, VA 24506

PROPELLER POLISHING
Aquafacs Marine Technical Services, Pier One, Berth One, Boston MA 02128
Pacific Marine Services, P.O. Box 3400, Terminal Island, CA 90731

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
Allison Gas Turbine Division, General Motors Corp., P.O. Box 420 Speed code U6, Indianapolis, IN 46206
Amarillo Gear Co., P.O. Box 1789, Amarillo, Texas 79105
Armco Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
BMV Bergen Diesel A.S., P.O. Box 924, N-5001 Bergen NORWAY; 2110-10 Service Rd., Kenner LA 70062
Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Caterpillar, Inc., Engine Division, 100 NE Adams St., Peoria IL 61629
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
Coolidge Propeller, 1608 Fairview Ave. East, Seattle, WA 98102; 3717 Industrial Rd., Pascagoula, MS 39567
Coolidge-Stone Vickers, Inc., 56 Squirrel Rd., Auburn Hills, MI 48057
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505
General Motors, Electro-Motive Division, LaGrange, IL 60525
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231
KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241
Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323
M.A.N.-B&W Diesel, 2 Ostervej, DK-4960 Holeby, Denmark
MTU of North America, 10450 Corporate Dr., Sugarland, TX 77478
MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
Mitsubishi International Corporation, Mita Kokusai Bldg. 4-28 Mita 1-chome, Minato-ku Tokyo 108 Japan
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 Parsippany Road, Parsippany, NJ 07054
Inland Water Propulsion Systems, Inc., 580 Walnut St., Cincinnati, OH 45201
Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032
SKF Steel, Couplings Div., 22 Waterville Rd., P.O. Box 745, Avon, CT 06001
Schottel of America, Inc., 8375 N.W. 56 St., Miami, FL 33166
Skinner Engine, Co., 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
Tenfjord Inc., 200 Jackson Ave., Hoboken, NJ 07030
Ulstein Maritime Ltd., 6307 Laurel St., Burnaby, B.C. Canada V5B 3B3
Ulstein Trading Ltd. A/S, N-6-65, Ulsteinvik, Norway
J.M. Voith GmbH Dept. WErung, Postfach 1940 7920 Heidenheim/Brenz, West Germany
Voith Schneider America, 159 Great Neck Rd., Ste. 200, Great Neck. NY 11021
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072

PUMPS—Repairs—Drives
Allweiler Pump Inc., 5410 Newport Dr., Rolling Meadows, IL 60008 TX: 270-0444
Cat Pumps Corp., 1681 94th Lane NE, Minneapolis MN 55434
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL MARINE
FMC Coffin Turbo Pump, 326 S Dean St., Englewood NJ 07631
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND
Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101
Meco (Mechanical Equipment Co., Inc.), 861 Carondelet Street, New Orleans, LA 70130
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
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
Grasso, Inc., 1101 N. Governor Street, P.O. Box 4799, Evansville, IN 47711-0799
United Technologies, Carrier Transicold Division, P.O. Box 4805, Syracuse, NY 13221

ROPE—Manila—Nylon—Hawsers—Fibers
A.L. Don Co., Foot of Dock St., Matawan, NJ 07747
Allied Fibers, 1411 Broadway, New York, NY 10018
Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008
Tubbs Cordage Company, P.O. Box 709, Orange, CA 92666
Tubbs Cordage Co., P.O. Box 7986, San Francisco, CA 94120-7986
Vermeire N.V. Industripark Zwaarveld, B-9160 Hamme, Belgium TX: 21687

SANITATION DEVICES—Pollution Control
Davit Sales Inc., P.O. Box 232, Jefferson Valley, NY 10535
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
FAST Systems Inc., 1717 Sublette, St. Louis, MO 63110
Golar Metal A/S, P.O. Box 70, 4901 Tvedestrand, Norway
Hamworthy Engineering Ltd., Poole, Dorset BH17 7LA ENGLAND

SCAFFOLDING EQUIPMENT—Work Platforms
McCausey Lumber Co., 7751 Lyndon, Detroit, MI 48238

SCALE MODELS
Oriental Industry Co., 408-29 Sokyo-Dong, Mapo-ku Seoul KOREA

SCUTTLES/MANHOLES
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

SHAFT SEALS, MECHANICAL PACKING
EG&G Sealol Engineered Prod. Div. Marine Products Group, Warwick, RI 02888
Garlock Inc., Mechanical Packing Div., 1666 Division St., Palmyra, NY 14522

SHIPBREAKING—Salvage
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
Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA. 93116
M.A.N.—GHH, Sterkrade Werfsrabe 112 D-4100 Duisburg 18, West Germany
MAN—GHH, P.O. Box 110240, D-4200 Oberhausen 11, West Germany
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
Welded Beam Company, P.O. Box 280, Perry, OH 44081

SHIPBUILDING—Repairs, Maintenance, Drydocking
Arsenale Triestino-San Marco Shipyard, Trieste, Italy, U.S. Rep: Marine Technologies & Brokerage, 33 Rector St., New York, NY 10066
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA 93116
Bay Shipbuilding Corp., 605 N. 3rd Ave., Sturgeon Bay, WI 54235
Bender Shipbuilding & Repair Co., Inc., P.O. Box 42, Mobile, AL 36601
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
Blohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1 (In US)-Blohm & Voss CO, Springfield, N.J.
Blount Marine Corp., P.O. Box 368, Warren, RI 02885
Brodosplit, Put Udarniku 19, P.O. Box 107, 58000 Split YUGOSLAVIA
Burrard Yarrows Corporation, P.O. Box 86099, North Vancouver, B.C., Canada
Chesapeake Shipbuilding Inc., 710 Fitzwater St., Salisbury, MD 21801
Cityvarvet AB, Lindholmen, P.O. Box 2753, S-402 76 Goteborg SWEDEN
Conrad Industries, P.O. Box 790, Morgan City, LA 70380
Coast Iron & Machine Works, 5225-7th Street E., Tacoma, WA 98424
Curacao Drydock (U.S.A.) Inc., 26 Broadway, Suite 741, New York, NY 10004
Eastern Marine, Inc., P.O. Box 1009, Panama City, FL 32401
Fincantieri SpA Cantieri Navali Italiani, Via Cipro 11, 16129 Genoa ITALY
Gladding-Hearn Shipbuilding, Box D (1 Riverside Ave.), Somerset MA 02726
Good People Sea And Shore Services Inc., 255 Commercial St., North Sydney, Cape Breton Island, NS CANADA B2A 3M3
HBC Barge Co. Brownsville, PA 15417
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
Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, KOREA
Industrial Marine Engineering Ltd., P.O. Box 172, Suva, Fiji
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
Paul Lindenau GmbH, & Co., Schiffswerft u. Maschinenfabrik, D-2300 Kiel-Friedrichsort, West Germany
Lisnave, Apartado 2138, 1103 Lisbon, Codex PORTUGAL
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, WA 98134
M.A.N. GHH Sterkrade, P.O.B. 110240, D-4200 Oberhausen 11, West Germany
Main Iron Works, Inc., P.O. box 1918, Houma, LA 70361
Marathon LeTourneau Offshore, P.O. Box 61865, Houston, TX 77208
Marco, Inc., 2300 W Commodore Way, Seattle, WA 98199
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
Moss Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552
National Marine Service (Shipyard Division), P.O. Box 38, Hartford, IL 62048
National Steel & Shipbuilding Corp., San Diego, CA 92112
Nautilus Surveys Inc., 10822 Sageleaf Lane, Houston, TX 77089
Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607
Nichols Brothers Boat Builders Inc., P.O. Box 580, 5400 S. Cameron Rd., Freeland, WA 98249
Northwest Marine Ironworks, P.O. Box 3109, Portland, OR 97208
Pennsylvania Shipbuilding, P.O. Box 442, Chester, PA 19016
Port Allen Marine, P.O. Box 108, Port Allen, LA 70767
Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22
Promet Marine Services Corp., 242 Allens Ave., Providence, RI 02905
Samsung Shipbuilding & Heavy Industries Co., Ltd., Samsung Main Bldg. 250, 2Ka, Taepyong-ro, Chung-ku, Seoul, Korea
Southwest Marine, Inc., P.O. Box 13308, San Diego, CA 92113
Tampa Shipyards Inc., P.O. Box 1277, Tampa, FL 33601
3. MAJ Associated Shipbuilding Industry, P.O. Box 117, 51001 Rijeka YUGOSLAVIA
Todd Shipyards Corporation, One Evertrust Plaza, Jersey City, NJ 07302
Tracor Marine, P.O. Box 13107, Port Everglades, FL 33316
Verreault Navigation Inc., Les Mechins, Quebec, G0J 1T0
Walker Boat Yard, P.O. Box 729, Paducah, KY 42001
Waller Marine, Inc. 11777 Katy Freeway/Suite 395, Houston, TX
Westport Shipyard, Inc., P.O. Box 308, Westport, WA 98595
Zidell Explorations, Inc., 3121 S.W. Moody Street, Portland, OR 97201

SHIPPING—PACKING
Pilotage Consultants, Inc., P.O. Box 2046, New Hyde Park, NY 11040
Signet Corporation, 1800 West Loop South, Suite 1600, Houston, TX 77027

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

Bay Shipbuilding Progressing With Construction Of Sea-Land Containerships

Bay Ship Hull No. 736 (foreground) being floated forward in graving dock. In background is Hull No. 735, having just been floated out of the dock, being towed to an outfitting pier for completion.

Bay Shipbuilding Corporation of Sturgeon Bay, Wisc., recently attained three major milestones in the construction of three D-7 containerships being built for Sea-Land Service. Hull 735, the first of the 710-foot vessels in the series, was floated out of Bay's 1,158-foot graving dock and berthed at one of the yard's outfitting piers. On the same day, the after end of Hull 736, including the machinery space, was floated forward to its completion position in the dock. Each ship will be powered by a low-speed Mitsui/B&W 7L70MC diesel rated at 22,000 bhp.

The third event took place just three days later, when the keel was laid for Hull 737 in the after end of the graving dock. Erection began immediately on the after end of Hull 737, the final vessel in the three-ship series.

When Hull 736 is ready to be floated out of the dock and moved to an outfitting pier, three large intermediate gate sections will be installed to isolate Hull 737 from the flooding waters of Sturgeon Bay. After pump-out of the dock, the three gate sections will be removed and erection of Hull 737 will be completed in its present location. This float-out/float-forward procedure allows Bay maximum utilization of its graving dock, making it an efficient tool in ship construction and repair.

Bay Shipbuilding, a subsidiary of The Manitowoc Company, is one of the largest and most modern shipyards on America's "North Coast," the Great Lakes.

The Wisconsin shipyard continues to pursue both new construction and vessel repair projects. Presently under contract, in addition to the three Sea-Land containerships, are two 6,000-cubic-yard, hydro-dump barges for Great Lakes Dredge & Dock Company.

For free literature on the complete facilities and capabilities of Bay Shipbuilding,

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Principals at keel laying of Hull No. 737 included (L to R): Cdr. **Dan Struck,** USCG, OCMI-Sturgeon Bay; **Bruce Shaw,** director of operations, Bay Ship; **Alex Reid,** project manager, Bay Ship; **Allen Powell,** Bay's executive vice president and general manager; **George Sampson,** project manager, Sea-Land Service; **Bob Zimmerman,** on-site construction manager, Sea-Land; **Bob Miller,** vice president and director of engineering, Bay Ship; **Harry Taylor,** principal surveyor, ABS; and **Tom Szwejbka,** ABS surveyor.

Moss Point Marine To Build Multipurpose Boat For U.S. Agency

Moss Point Marine, Inc. of Escatawpa, Miss., has been awarded a contract to build a 121-foot, multipurpose vessel for use by the U.S. Fish and Wildlife Service in Alaska. The all-steel boat, designed by Jensen Maritime Consultants of Seattle for operations in the Bering Sea and Southern Alaskan waters, will have a beam of 33 feet and depth of 14 feet.

The Anchorage-based vessel will serve many functions, including support for wildlife refuge camps, sea analysis of wildlife, and surveys of coastal land inhabitants.

The boat will have accommodations for a crew of 22, including quarters for short-term scientific personnel. She will be outfitted with advanced sonar and other electronic equipment for scientific analysis, and will have 4,800 cubic feet of cargo space. She will carry 40,000 gallons of fuel and 4,000 gallons of water.

John Dane III, president of Moss Point Marine, said, "The award of this contract is an indicator of our ability to build a wide range of specialized vessels while competing successfully throughout the nation."

Moss Point Marine is currently building two 88-foot fireboats for the Port of Long Beach, Calif.; completing a 105-foot tug for the Panama Canal Commission; converting a 219-foot tug/supply boat to a well stimulation vessel for Dowell Schlumberger; and building two 135-foot landing craft (LCU) and thirty-one 110-foot lighters for the U.S. Navy.

For detailed literature on the services and facilities offered by Moss Point Marine,

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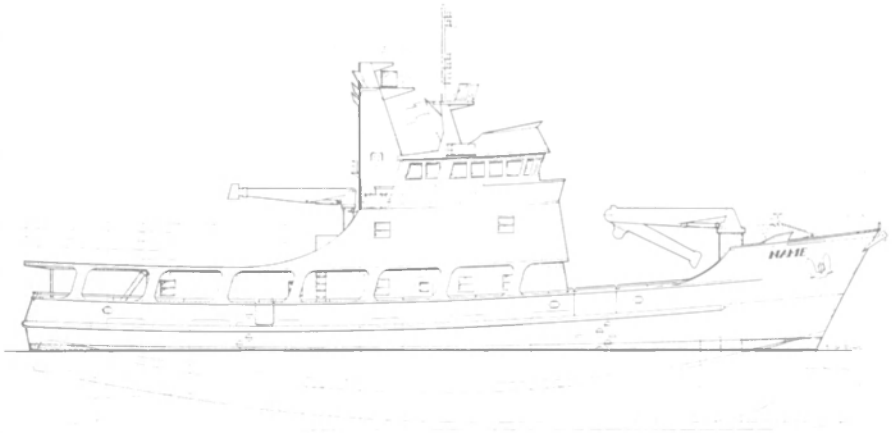

Drawing of the multipurpose boat to be built by Moss Point Marine for the U.S. Fish and Wildlife Service.

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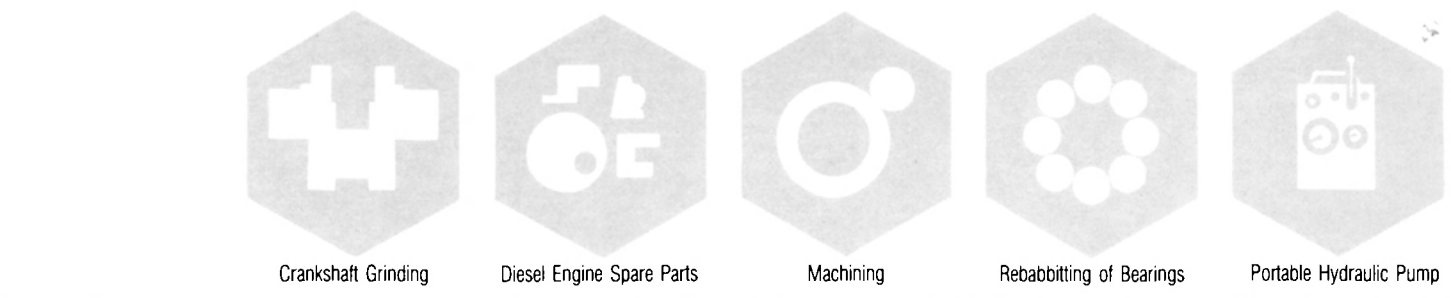

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